WEBEL TECHNOLOGY LIMITED

CORRIGENDUM – I
WTL/PC/CCTV/23-24/029 dated 21.09.2023

Sl No.	Page No.	Section	Clause No.	Description as per Tender	To be read as
01	8	SECTION-B, ELIGIBILITY CRITERIA	13	The bidder should comply with the Rule 144(xi) of the GFR-2017 on Land Border Sharing. One Declaration on Bidder's letterhead to be submitted.	The bidder should comply with the Rule 144(xi) of the GFR-2017 on Land Border Sharing. One Declaration on Bidder's and OEM's letterhead to be submitted.
02	9	SECTION-B, ELIGIBILITY CRITERIA	15	The bidder should have minimum annual business turnover in aggregate considering last three financial years ending 31st March 2023: • Not less than Rs. 70 crores to bid for three Commissionarates (Three Zones) • Not less than Rs. 45 crores to bid for two Commissionarates (Two Zones only) • Not less than Rs. 20 crores to bid for one Commissionarate. (One Zone only)	The bidder should have minimum annual business turnover in aggregate considering last three financial years ending 31st March 2023: • Not less than Rs. 60 crores to bid for three Commissionarates (Three Zones) • Not less than Rs. 40 crores to bid for two Commissionarates (Two Zones only) • Not less than Rs. 20 crores to bid for one Commissionarate. (One Zone only)
03		All Zones: 5MP IR Vari-Focal Bullet Network Camera (Certifications)	38	FCC, CE, UL, BIS, IK10, NEMA 4X	FCC, CE, UL, BIS, IK10
04		All Zones: 5MP IR Vari-Focal Bullet Network Camera (Network Protocol)	32	IPv4; IPv6; HTTP; TCP; UDP; RTSP; RTCP; SMTP; FTP; SFTP; DHCP; DNS; DDNS; NTP; Multicast; ICMP; IGMP; PPPoE; SNMP; TLS/ SSL; Telnet/ SSH.	HTTP; TCP; UDP; RTSP; RTCP; SMTP; FTP; SFTP; DHCP; DNS; DDNS; NTP; Multicast; ICMP; IGMP; PPPoE; SNMP; TLS/ SSL; Telnet/ SSH.
05		All Zones: 2MP 33x CMOS Sensor IR PTZ Network Camera (Electronic Shutter)	7	1/1s~1/100,000s or Better	1/1s~1/30,000s or Better

06		All Zones: 2MP 33x CMOS Sensor IR PTZ Network Camera (Back Light Compensation)	9	BLC , HLC , WDR (140dB)	WDR: 120dB or Better
07		All Zones: 2MP 33x CMOS Sensor IR PTZ Network Camera (Pan Travel)	12	0°~360° endless, Pan Speed: 0.1° ~ 180°/sec	0°~360° endless, Pan Speed: 0.1° ~ 120°/sec
08		All Zones: 2MP 33x CMOS Sensor IR PTZ Network Camera (Manual Speed)	14	Pan: 0.1° ~180° /s; Tilt: 0.1° ~120° /s	Pan: 0.1° ~160° /s; Tilt: 0.1° ~120° /s
09		All Zones: 2MP 33x CMOS Sensor IR PTZ Network Camera (Pre-sets & Pattern)	15	400 Preset, 5 Pattern, 8 Tour, Auto Pan, Auto Scanor Mode	300 Preset, 4 Pattern, 8 Patrols
10		All Zones: 2MP 33x CMOS Sensor IR PTZ Network Camera (Video Streaming)	22	Main stream: PAL: 50 fps (1920 x 1080, 1080 x 720, 704 x 576, 640 x 480); NTSC: 60 fps (1920 x 1080, 1280 x 720, 704 x 480, 640 x 480). Sub stream: PAL: 25 fps; NTSC: 30 fps. Third stream: PAL: 25 fps; NTSC: 30 fps.	Main stream: PAL: 25 fps (1920 x 1080, 1280 x 720); NTSC: 30 fps (1920 x 1080, 1280 x 720). Sub stream: PAL: 25 fps; NTSC: 30 fps. Third stream: PAL: 25 fps; NTSC: 30 fps.
11		All Zones: 2MP 33x CMOS Sensor IR PTZ Network Camera (Weather Proof Standard)	34	IP66/ IP67 & IK10 Vandal proof rating or better	IP66/ IP67
12		All Zones: ANPR Camera (Lens)	03	Built-in 10 mm – 50 mm motorized vari-focal lens or Better	Built-in 10 mm – 55 mm motorized vari-focal lens or Better
13		All Zones: ANPR Camera (Exposure Mode)	06	Full auto, customized auto, customized	Full auto/ manual/ customized auto/ customized
14		All Zones: ANPR Camera (Iris Control)	07	Fixed iris/ manual iris/ auto iris/ P iris	Fixed iris/manual iris/auto iris/P iris/ DC Drive

15		All Zones: ANPR Camera (Video Resolution)	09	4M (2688 × 1520)/1080P (1920 × 1080)/UXGA (1600 × 1200)/720P (1280 × 720)/D1 (704 × 576)/CIF (352 × 288)	4MP (2688 × 1520)/ 2MP (1920 × 1080)/ 720P (1280 × 720)/ 4CIF (704 × 576)
16		All Zones: ANPR Camera (Video Frame Rate)	10	Maximum 25fps; main stream (2688 × 1520@25fps), sub stream (1600 × 1200@25fps)	Main Stream: 25fps (2688 × 1520, 1920 x 1080); Sub stream: 25 fps (1920 × 1080, 1280 x 720)
17		All Zones: ANPR Camera (Storage)	19	Support SD card (Minimum 256GB)	Support SD card (Minimum 128GB)
18		All Zones: 16 Channel Standalone Network Video Recorder (Video Resolution)	08	HDMI1: 3840 × 2160 , 1920 × 1080 , 1280 × 1024, 1280 × 720 , 1024 × 768 VGA1: 1920 × 1080 , 1280 × 1024, 1280 × 720 , 1024 × 768 ; HDMI2/VGA2: 1920 × 1080	HDMI1: 3840 × 2160, 1920 × 1080, 1280 × 1024, 1280 × 720, 1024 × 768 VGA1: 1920 × 1080, 1280 × 1024, 1280 × 720, 1024 × 768
19		All Zones: 16 Channel Standalone Network Video Recorder (HDD)	13	2 SATA III ports, up to 10 TB for a single HDD.	2 SATA II ports, up to 10 TB for a single HDD.
20	44	All Zones: Central Video Monitoring Software	1	Video Management Software with high scalable design and distributed deployment, easily expand the supported channels to 20,000 and central storage capacity to 4 PB. The multi-site function allows to incorporate multiple VMS platforms into one, and conveniently show their information on one PC client. With hot standby and N+1 redundancy. Available access live and recorded videos, real-time and historical events. AI capabilities that devices have, such as face recognition, automatic number plate recognition and video metadata, etc.	Video Management Software with high scalable design and distributed deployment, easily expand the supported channels to 20,000 and central storage capacity to 4 PB. The multi-site function allows to incorporate multiple VMS platforms into one, and conveniently show their information on one PC client. With hot standby and N+1 redundancy.
21		All Zones: Central Video	39	The software shall be able to select the required recording	The software shall be able to select the required recording

		Monitoring Software		based on the time recording was activated, the duration of recording, operator activated recording, event activated recording, scheduled recording.	based on the time recording was activated, the duration of recording, operator activated recording, event activated recording.
22		All Zones: Central Video Monitoring Software	43	Software shall have the capacity to communicate with IP Cameras / Encoders using HTTPS secure protocol. It shall support any form of IP network connectivity, including: LAN/ WAN/ VPN/ Internet/ Wireless technologies.	Software shall have the capacity to communicate with IP Cameras / Encoders using HTTPS secure protocol. It shall support any form of IP network connectivity, including: LAN/ WAN/ VPN/ Internet.
23		All Zones: Central Video Monitoring Software	49	ANPR	Removed
24		All Zones: Central Video Monitoring Software	50	Vehicle Blacklist	Removed
25		All Zones: Central Video Monitoring Software	69	Should Support Minimum 100 per second	Should support minimum 40 per second or more
26		All Zones: Central Video Monitoring Software	70	Should Support Minimum 100 per second	Should support minimum 20 per second or more
27		All Zones: Central Video Monitoring Software	71	Should Support 100 events per second	Removed
28		All Zones: 600VA Offline UPS (Physical)	-	Dimension, D X W X H (mm): 279 X 101 X 142 Net Weight (kgs): 4.2 Material: Semi Metallic	The Clause Removed
29		All Zones: UTM Firewall Hardware Device	-	The firewall should 5 x 1GbE RJ45 connectors, 1000 Base-TX (10/100/1000Mbps). 2 USB 3.0, 1 RJ45 RS232 console port. Wireless Radio Type and Frequency Band, (T25–W) - 2x2 802.11ax Wi-Fi 6 dual band radios, 2.4 GHz: Data rates up to 573 Mbps, 5 GHz: Date rates up to 1.2 Gbps	The firewall should 5 x 1GbE RJ45 connectors, 1000 Base-TX (10/100/1000Mbps). 2 USB 3.0, 1 RJ45 RS232 console port. Wireless Radio Type and Frequency Band, 2x2 802.11ax Wi-Fi 6 dual band radios, 2.4 GHz: Data rates up to 573 Mbps, 5 GHz: Date rates up to 1.2 Gbps

30		All Zones: UTM Firewall Hardware Device	-	• Memory/Flash : RAM: DDR4 4GB, eMMC 4GB Storage Power supply - Input Ratings: 100-240V AC, 0.9A Max, 50-60Hz. Output Ratings: 12V DC, 2.5A, 30W Power Consumption - T25: 21 Watts, T25-W: 25 Watts	• Memory/Flash : RAM: DDR4 4GB, eMMC 4GB Storage Power supply - Input Ratings: 100-240V AC, 0.9A Max, 50-60Hz. Output Ratings: 12V DC, 2.5A, Power Consumption - 25 Watts
31		16 Channel Standalone Network Video Recorder		Video Output : 1 × HDMI output	1 × VGA output, 1 × HDMI output, supports simultaneous video sources output for VGA and HDMI
32		All Zones & all Cameras :Image Sensor		1/1.8" CMOS or Better	1/2.8" CMOS or Better
33		General Surveillance Management Server & Storage system			Technical Specification newly added for Zone 1
34		17U Floor Mount Standing Rack			Technical Specification newly added for Zone – 1 & 2
35		12U Wall Mount Indoor Rack			Technical Specification newly added for Zone - 1
36		TECHNICAL SPECIFICATION WITH COMPLIANCE STATEMENT			Revised Technical specification is as enclosed in Section I

TECHNICAL SPECIFICATION TO BE ADDED:

17U Floor Mount Standing Rack			
Sl. No	Technical Specification	Specification (Quoted / Applicable - by the bidder)	Complied (Yes/No)
1	19", 17U x 600mm width x 800mm depth Floor Standing Networking Rack		
2	It should confirm to DIN 41494 or equivalent ISO standard		
3	It should be welded construction with steel frame		
4	Single Lockable tough end glass front door		
5	Vented metal door at the back, Vented side panels		
6	Powdered coated standard finish		
7	4 sets of casters wheel		

General Surveillance Management Server & Storage system

Sl. No.	SPECIFICATIONS	
1	Controller	64-bit multi-core processor (Dual Controller)
2	Cache	8GB or higher
3	Network Protocol	iSCSI , RTSP, ONVIF
4	RAID level	RAID 0, 1, 5, 6, 10, JBOD, Hot-Spare
5	HDD Hot-pluggable	24 -slot (Hot-pluggable); interface type-SSD
6	Incoming bandwidth for camera's video recording	minimum 800Mbps or higher (or it should be capable of storing minimum 200 camera's recording @2MP resolution per single Storage/recording server.)
7	Storage scalability	It should have provision for 240 TB storage capacity for future storage expansion
8	Features	It shall support: - CPU load balance. - Auto fan tuning. - Supports direct IP camera/NVR streaming and recording. - Supports camera access through RTSP, ONVIF protocol. - Supports both Direct Streaming Mode and IPSAN Mode - RAID-based tamper-proof data technology. - Auto data synchronization between devices. - SAS interface for storage enclosure. - SAS interface for storage enclosure.
9	Searching mode	Support search by time and event
10	Network Interface	4 x 1000M Ethernet interface, network redundancy
11	USB interface	2 x USB 3.0
12	miniSAS expansion port	min. 1
13	Working Temperature	-20℃ ~ 60℃
14	Working Humidity	5%-90% RH (non-condensing)
15	Power Supply	Should have Redundant power supply
16	Certification	CE, FCC, BIS/UL

8	4 sets of adjustable levelers			
10	Horizontal Cable Manager			
11	OEM should have valid ISO 9001, ISO 14001 & ISO 45001:2018 certified for design and development of LAN and WAN products, all the relevant certificates must be submitted along with the bid.			
12	Mounting Hardware set			
13	At least 2nos. Of FANs (180CFM) for cooling purpose			
14	Make / Brand	Any globally reputed Manufacturer presence in India.		

12U Wall Mount Indoor Rack

Sl. No	Technical Specification	Specification (Quoted / Applicable - by the bidder)	Complied (Yes/No)
1	12U, 19" 600mm Width, 600mm Depth, Wall Mount Networking Enclosure.		
2	It should confirm to DIN 41494 or equivalent standard		
3	It should be welded /CKD construction with steel frame		
4	Lockable tough ended glass front door.		
5	19" mounting angle made of formed steel		
6	Powdered coated standard finish		
7	Top & Bottom welded cover with vented & cable entry exit cut outs.		
8	2 pair of 19" mounting rails.		
9	1U Cable Manager.		
10	Roof Mounted Fan Unit (2Nos.).		
11	230V AC, 6 way, 5/15 Amp Power Distribution Unit		
12	Mounting Hardware		
13	OEM should have valid ISO 9001 & ISO 14001 & ISO 45001 for design & development of networking products. Documents need to be submitted along with the tender.		

TECHNICAL SPECIFICATION WITH COMPLIANCE STATEMENT

(Tender No. WTL/PC/CCTV/23-24/029)

Zone - 1

Minimum Specification of 5 MP IR Vari-Focal Bullet Network Camera

Sl. No	Feature	Technical Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	Image Sensor	1/2.8" CMOS Sensor or Better		
2	Resolution	Minimum 2592 (H) × 1944 (V)		
3	Scanning System	Progressive		
4	Electronic Shutter Speed	Auto/Manual 1/15 s–1/100,000 s		
5	Min. Illumination	0.01 lux@F1.4 (Color) or Better		
		0.01 lux@F1.4 (B/W) or Better		
		0 lux (Illuminator on)		
6	S/N Ratio	>52 dB		
7	IR Illumination Distance	50 meter or Better		
8	Illuminator On/Off Control	Auto / Manual		
9	Lens Type	Motorized vari-focal		
10	Focal Length	OEM fitted 2.8 mm–12 mm or Better		
11	Iris Control	Auto/ Mannual		
12	**Professional, intelligent**			
	IVS (Perimeter Protection)	Support Intrusion, tripwire		
13	Video Compression	H.265+/ H.265/ H.264/ MJPEG		
14	Video Frame Rate	Main stream: 2592 × 1944 @ 30 fps or Better		
		Sub stream 1: D1 @ 30 fps or Better		
		Sub stream 2: 2048 × 1536 @ 8 fps or Better		
15		Sub stream 3: 1980 × 1080 @ 30 fps or Better		
16	Stream Capability	4 streams or Higher		
17	Resolution	2592 × 1944; 2592 × 1520; 2048 × 1536; 1920×1080; 720p; D1; VGA; 2CIF; CIF.		
18	Bit Rate Control	CBR/VBR		
19	Day/Night	Auto(ICR)/Color/B/W		

20	BLC	Should Support		
21	WDR	120 dB or Higher		
22	White Balance	Auto/ Natural/ Street lamp/ Outdoor		
23	Gain Control	Auto		
24	Noise Reduction	3D NR		
25	Motion Detection	Should Support		
26	Region of Interest (RoI)	Should Support		
27	Mirror	Should Support		
28	Image Rotation	Should Support		
29	Privacy Masking	Should Support		
30	Alarm Event	Storage full; network disconnection; IP conflict; motion detection; video tampering; intrusion; tripwire; audio detection.		
31	SDK and API available	Yes		
32	Network Protocol	HTTP; TCP; UDP; RTSP; RTCP; SMTP; FTP; SFTP; DHCP; DNS; DDNS; NTP; Multicast; ICMP; IGMP; PPPoE; SNMP; TLS/ SSL; Telnet/ SSH.		
33	Interoperability	ONVIF (Profile S/Profile G/Profile T)		
34	Storage	Micro SD card (support minimum 256 GB)		
35	Mobile Client	iOS; Android		
36	Operation Temperature / Humidity	-10 ºC to 55 ºC / Less than 95% RH		
37	Weather Proof Standard	IP67		
38	Certifications	FCC, CE, UL, BIS, IK10		
39	Make / Brand	Any globally reputed Manufacturer presence in India & having manufacturing facility in India.		

2 Megapixel 33x CMOS Sensor IR PTZ Network Camera

Sl no.	Feature	Technical Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	Image Sensor	1/2.8" CMOS or Better		
2	Effective Pixels	1920(H) x 1080(V) or Better		
3	Minimum Illumination	Colour: 0.001 Lux @F1.5; B/W: 0 Lux with IR		
4	Focal Length	The Camera should be provided with an OEM fitted 4.6~152 mm of focal length or Better		

5	White Balance	Auto, ATW, Indoor, Outdoor, Manual		
6	Focus Control	Auto / Manual		
7	Electronic Shutter	1/1s~1/30,000s or Better		
8	AGC control	Auto / Manual		
9	Back Light Compensation	WDR: 120dB or Better		
10	Optical Zoom	33x or Higher		
11	Digital Zoom	16x or Higher		
12	Pan Travel	0°~360° endless, Pan Speed: 0.1° ~ 120°/sec		
13	Tilt Travel	- 15° ~ 90° auto flip 180°, Tilt Speed: 0.1° ~120°/sec		
14	Manual Speed	Pan: 0.1° ~160° /s; Tilt: 0.1° ~120° /s		
15	Presents & Pattern	300 Preset, 4 Pattern, 8 Patrols		
16	Present Speed	Pan: 240° /s; Tilt: 180° /s		
17	IR Illumination Distance	200 meter or Better		
18	Privacy Masking	24 Areas or More		
19	Power up Action	Auto restore to previous PTZ and lens status after power failure		
20	Day/Night: IR Cut Filter	Auto (ICR) / Colour / B/W		
21	Video Compression	H.265+/H.265 & H.264+/H.264		
22	Video Streaming	Main stream: PAL: 25 fps (1920 x 1080, 1280 x 720); NTSC: 30 fps (1920 x 1080, 1280 x 720). Sub stream: PAL: 25 fps; NTSC: 30 fps. Third stream: PAL: 25 fps; NTSC: 30 fps.		
23	Audio Compression	G.711a/G.711M/ADPCM/ AAC_LC		
24	Motion Detection	Should Support		
25	ROI	Should Support		
26	Audio Streaming	1/1 channel In/Out		
27	Auto Tracking	Should Support		
28	IVS	Tripwire, Intrusion, bright lights etc.		
29	Networking	RJ-45/ RS485		
30	Protocols	IPv4; IPv6; HTTP; TCP; RTSP; SMTP; FTP/ SFTP; DHCP; DNS; DDNS; NTP; Multicast; IIGMP; PPPoE; SNMP.		

31	Event Trigger	Motion detection, Video tampering , Scene changing, Network disconnection, IP address conflict		
32	Alarm	6/2 channel In/Out		
33	Operating Temperature	-10°C ~ 55°C / Less than 95% RH		
34	Weather Proof Standard	IP66/ IP67		
35	Power Source	AC24V, PoE++ Both Support		
36	Certifications	FCC, CE, UL, BIS, IK10		
37	Make / Brand	Any globally reputed Manufacturer presence in India & having manufacturing facility in India.		

ANPR Camera

Sl no.	Feature	Technical Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	Main Processor	High performance embedded processor to extract and analyse vehicle metadata		
2	Image Sensor	1/2.8'' CMOS or Better		
3	Lens	Built-in 10 mm – 55 mm motorized vari-focal lens or Better		
4	Shutter Mode	Single shutter		
5	Electronic Shutter Speed	1/25 s–1/100000 s (manual/auto) or Better		
6	Exposure Mode	Full auto/ manual/ customized auto/ customized		
7	Iris Control	Fixed iris/manual iris/auto iris/P iris/ DC Drive		
8	Image Resolution	2688 × 1520 or Higher		
9	Video Resolution	4MP (2688 × 1520)/ 2MP (1920 × 1080)/ 720P (1280 × 720)/ 4CIF (704 × 576		
10	Video Frame Rate	Main Stream: 25fps (2688 × 1520, 1920 x 1080); Sub stream: 25 fps (1920 × 1080, 1280 x 720))		
11	Video Compression	H.265+/H.265/H.264M/H.264H/ H.264B/MJPEG		
12	Picture Encoding Format	JPEG		
13	WDR	Minimum 140dB		

14	White Balance	Auto/outdoor/manual/local white balance/natural		
		light/street light		
15	Noise Reduction	2DNR/3DNR		
16	HLC	Should Support		
17	Bad Pixel Correction	Should Support		
18	Edge Enhancement	Should Support		
19	Storage	Support SD card (Minimum 128GB)		
20	Image Tampering Prevention	Should Support Watermark and verification are available for videos and pictures		
21	Security	Authorized username and password, MAC address binding, HTTPS encryption, and network access control		
22	License Plate Recognition	Adopts self-developed algorithm to recognize license plates combining numbers and letters		
23	Vehicle Type Recognition	Should Support		
24	Vehicle Color Recognition	Should Support		
25	Motor Vehicle Violation Capture	Should Support		
26	Video Metadata	Should Support Motor vehicle: License plate, vehicle type, vehicle color, license plate color, vehicle logo, and more. Non-motor vehicle: Type (two-wheelers, three-wheelers), color, wearing a helmet or not, passenger (1, 2, 3, or more passengers)		
27	Vehicle recognition rate	≥98%		
28	Network	1 RJ-45 Ethernet port, 10/100/1000M Network transmission		
29	Alarm Input & Output	1 channel In & 1 channel Out		
30	Audio Input & Output	1 channel In & 1 channel Out		
31	Illuminator Number	4 illuminators (850nm IR LED illuminators, brightness adjustable)		
32	Power Supply	12V DC, 24V DC, PoE		
33	Operating Temperature	-10°C to 55°C		
34	Protection Grade	IP67/ IK10 or Better		
35	Certification	FCC, CE, BIS		

36	Make / Brand	Any globally reputed Manufacturer presence in India & having manufacturing facility		
		in India.		

16 Channel Standalone Network Video Recorder

Sl no.	Feature	Technical Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	Processor	Industrial-grade embedded processor		
2	IP Camera Input	16 channel		
3	Operating System	Embedded LINUX		
4	Two-way Talk	1 channel Input, 1 channel Output, RCA		
5	User Interface	GUI		
6	Video Output	1 × VGA output, 1 × HDMI output, supports simultaneous video sources output for VGA and HDMI		
7	Compression	H.265/H.264/MJPEG		
8	Video Resolution	HDMI1: 3840 × 2160, 1920 × 1080, 1280 × 1024, 1280 × 720, 1024 × 768 VGA1: 1920 × 1080, 1280 × 1024, 1280 × 720, 1024 × 768		
9	Network Bandwidth	Uplink: 160 Mbps; Downlink: 160 Mbps		
10	Video Display Split	1 , 4, 8, 9, 16 views		
11	Resolution	12MP		
12	Playback Function	1. Play/pause/stop/slow/quick/backward/by frame 2. Full screen, backup (video clip/file), partial zoom in, and audio on/off		
13	HDD	2 SATA II ports, up to 10 TB for a single HDD.		
14	Alarm Input	Minimum 2 Ch.		
15	Alarm Output	1 Ch.		
16	Smart Phone	iPhone, iPad, Android Phone		
17	Recording Mode	Manual record; alarm recording; MD recording		
18	Search Mode	Time/Date, Alarm, MD & Exact search		
19	Backup Mode	USB storage device/ NAS/ FTP		
20	Interface Ports	2 (1 USB 2.0, 1 USB 3.0)		
21	Max User Account	128 users		
22	Ethernet	1 × RJ-45, 10/100/1000 Mbps self-adaptive Ethernet port		

23	Protocols	HTTP/ HTTPS; TCP/IP; IPv4/IPv6; RTSP; UDP; SMTP; NTP; DHCP; DNS; IP Filter; DDNS; FTP; Alarm		
		Server; IP Search; Network Acceleration; P2P.		
25	Power Supply	12V DC, 5A or AC 100V ~ 240V		
26	Fan	Smart fan, automatically adjust running speed		
27	Working Temp	0 °C to 50 °C		
28	Make / Brand	Any globally reputed Manufacturer presence in India & having manufacturing facility in India.		

General Surveillance Management Server

Sl. No	Feature	Technical Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	Processor	Intel Xeon-Silver 4216 Processor or AMD EPYC 7282 or Higher		
2	No. of Core	16 Core or Higher		
	Processor speed	2.5 GHz or Higher		
7	Operating System	Microsoft Windows Server 2022 16 Core Standard loaded		
8	Generation	Gen10 or latest		
9	HDD	2 x 480GB SATA / SSD		
10	Power	500W Flex Slot Platinum Hot Plug Low Halogen Power Supply Kit		
11	Storage controller	Smart Array E208i-a SR Gen10 (8 Internal Lanes/No Cache) 12G SAS Modular LH Controller		
12	Memory, standard	64 GB DDR4 3200MHz with 16 DIMMs		
13	Mouse	Optical Mouse		
14	Keyboard	Keyboard		
15	Ethernet	Ethernet 1Gb X 4-port 331T Adapter		
16	Mounting	1x CMA for rail kit		
17	Form Factor	Rack		
18	Make / Brand	Any globally reputed Manufacturer presence in India & having manufacturing facility in India.		

General Surveillance Management Server & Storage system

Sl. No.	SPECIFICATIONS	
1	Controller	64-bit multi-core processor (Dual Controller)
2	Cache	8GB or higher

3	Network Protocol	iSCSI , RTSP, ONVIF
4	RAID level	RAID 0, 1, 5, 6, 10, JBOD, Hot-Spare
5	HDD Hot-pluggable	24 -slot (Hot-pluggable); interface type-SSD
6	Incoming bandwidth for camera's video recording	minimum 800Mbps or higher (or it should be capable of storing minimum 200 camera's recording @2MP resolution per single Storage/recording server.)
7	Storage scalability	It should have provision for 240 TB storage capacity for future storage expansion
8	Features	It shall support: - CPU load balance. - Auto fan tuning. - Supports direct IP camera/NVR streaming and recording. - Supports camera access through RTSP, ONVIF protocol. - Supports both Direct Streaming Mode and IPSAN Mode - RAID-based tamper-proof data technology. - Auto data synchronization between devices. - SAS interface for storage enclosure. - SAS interface for storage enclosure.
9	Searching mode	Support search by time and event
10	Network Interface	4 x 1000M Ethernet interface, network redundancy
11	USB interface	2 x USB 3.0
12	miniSAS expansion port	min. 1
13	Working Temperature	-20℃ ~ 60℃
14	Working Humidity	5%-90% RH (non-condensing)
15	Power Supply	Should have Redundant power supply
16	Certification	CE, FCC, BIS/UL

Central Video Monitoring Software

Sl. No	Feature	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	Video Management Software with high scalable design and distributed deployment, easily expand the supported channels to 20,000 and central storage capacity to 4 PB. The multi-site function allows to incorporate multiple VMS platforms into one, and conveniently show their information on one PC client. With hot standby and N+1 redundancy.		
2	VMS Shall be based on Microsoft windows OS.		

3	VMS shall be open to IP camera integration in that respects VMS should support IP Cameras from Multiple OEM.		
4	The VMS shall be ONVIF compliant.		
5	VMS shall be open to any NAS (CIFS, SMB 2.0) integration.		
6	VMS shall support H.264 and MJPEG stream for both live view and Recording independently. Compression rate shall be manageable.		
7	The Video Management System shall support cameras with resolutions ranging from Standard Definition, High Definition (HD) and higher resolution		
8	The Video Management System shall show video across 4 displays per workstation - each display can have up to 25 viewing panes.		
9	VMS shall be able to connect with video wall through multi-display client.		
10	Users shall be able to move any image from one display screen to another via drag-and-drop		
11	The VMS shall allow the overlay of time and date information on live video panes		
12	Users shall be able to digitally zoom and also digitally scroll live video from any camera using the mouse wheel		
13	Users shall be able to replay currently viewed live video for replays from 10, 15 or 30 seconds before current time or from alarm time.		
14	The VMS shall allow users to reset the event count for a camera It should be able to display camera information in the On-Screen Display (OSD).		
	a. Camera name		
	b. Date and time		
15	VMS shall be accessible using any desktop client utility for Live view and Archive search		
16	VMS should support the two-way audio so that users shall be able to listen audio from multiple cameras through PC speakers and may speak to one or more cameras through a PC microphone		
17	VMS shall allow managing initial client logon, system configurations, logging, remote administration of recording servers, devices, security, rules, alerts and logging.		
18	VMS shall support at least 3 levels of users with various privileges to access the system functionality. Eachcategory of users shall have selectable rights to perform various operations like Camera add/delete, Change camera settings, Configure storage, Control PTZ cameras, User management, etc		
19	VMS shall maintain a continuous log of server status		

	messages, Camera connectivity, Storage status, Recording ON/OFF, User activity logs , etc which shall be accessed from the Workstations using different filters			
20	Each video streams shall be individually and independently configurable in term of resolution, frames and bandwidth			
21	VMS shall support video streams up to at least 25/30fps			
22	VMS shall support at least CIF, 2CIF, 4CIF/D1 and HD/Megapixel resolution			
23	PTZ Control	All PTZ control shall be user-restricted		
		Users shall be able to zoom a PTZ camera in or out using the PC mouse		
		Users shall be able to pan, tilt and zoom a PTZ camera displayed in a video pane or monitor using a joy stick on one of the supported CCTV keyboards		
		Users shall be able to adjust the iris of a PTZ camera using the on screen PTZ controls or a CCTV keyboard:-Open iris-Close-Auto-iris		
		The Video Management System shall support the following for cameras using the ONVIF interface or Camera Gateway		
		a. Pan, tilt and zoom control with mouse and joystick		
		b. Go to pre-set		
		c. Set pre-set		
24	The VMS shall have the capability of operating in an environment that requires multi-tasking, when using multiple cameras spread over a wide area			
25	VMS should have Pre and Post Event Recording			
26	VMS should have Motion Detection technology			
27	Software provides remote interface with a full live feed view, with digital zoom options, control of PTZ cameras, multiple simultaneous feeds, and image quality settings to improve performance through bandwidth reduction			
28	Software has built in feature to bring camera observation to mobile devices (require a software on a mobile device to view)			
29	Each camera setting can be adjusted individually according to client's requirement			
30	Schedule operation - All cameras can be fully scheduled individually			
31	View and record multiple cameras			
32	As many playback sessions as are required can be displayed at once			

33	Automatic control of supported PTZ cameras		
34	Alerting by email (with images)		
35	Software should have built in feature to bring camera observation to mobile devices (require a software on a mobile device to view)		
36	The software shall allow:		
A	Live display of cameras.		
B	Live display of camera sequences.		
C	Control of PTZ cameras.		
D	Playback of archived video.		
E	Retrieval of archived video.		
F	Instant Replay of live video.		
G	Configuration of system settings.		
H	Configuration and programming of P/T/Z cameras, features like camera addressing, BLC, auto tours, pre-sets etc.		
I	Video Analytics		
37	The software should be able to do video recording on any of the following options - inbuilt hard disks on the server, direct attached storage boxes attached to servers, network attached storage, storage area network.		
38	The software should be capable of handling camera and alarm icons on area maps. The area map should be configurable to pop up upon the receipt of an alarm received from a camera on the map. This can be on the same or other monitors on the PC.		
39	The software shall be able to select the required recording based on the time recording was activated, the duration of recording, operator activated recording, event activated recording.		
40	It shall be possible to search for recordings in the software by camera, date and time. If a data and time is specified, playback shall commence from that date and time. It shall be possible to playback more than one camera simultaneously.		
41	It Software shall allow operators to bookmark the concern videos & browse through a list of all bookmarks created on the system and select any bookmarked event for viewing. Software shall support industry standard for the interface of IP-based physical security products: ONVIF and shall be based on a server/client model.		
42	VMS should use two independent streams Camera or IP encoders: One for Live View and other for recording. All settings for each stream including resolution, codecs, frame rate and compression level may be choose independently without affection overall system performance and IP device functionality.		
43	Software shall have the capacity to communicate with IP Cameras / Encoders using HTTPS secure protocol. It shall support any form of IP network connectivity, including: LAN/ WAN/ VPN/ Internet.		
44	All audio streams supplied from IP Camera / Encoders shall be digitally encoded in g711 (u-law)/ g721/ g723 or AAC compression formats and recorded simultaneously		

	in real time.			
45	Software shall offer redundant architecture for recording in server. Roles shall move from one server to another without disturbing the regular operations. To minimize network traffic, Software must have ability to configure the key frame interval (I-frame) per second.			
46	All video streams supplied from IP cameras / Encoders shall be digitally encoded in MPEG-4/MPEG-2/MJPEG and H.264 compression formats and recorded simultaneously in real time			
47	Each camera's bit rate, frame rate and resolution shall be set independently and changing these settings will not affect the recording and display settings of other cameras.			
48	Software shall support dynamically switch the video resolution according to the Tile Size on Monitoring Screen. High Resolution Video feed while watchingsingle camera on screen and Low Resolution Video feed while watching Cameras in Multiple tiles.			
49	Removed			
50	Removed			
51	Devices	Should Support Minimum 2,000 devices Per Server		
52	Auto-Registered Devices	Should Support Minimum 1,000 devices Per Server		
53	Video Devices and Channels	Should Support Minimum 1,000 devices; 2,000 channels Per Server		
54	Devices Added by ONVIF Protocol	Should Support Minimum 1,000 devices; 2,000 channels		
55	ANPR Channels	Should Support Minimum 500 channels		
56	Total Devices	Should Support Minimum 10,000 locations; 65,000 cameras		
57	Total Incoming Bandwidth	Should Support Minimum 600 Mbps		
58	Incoming Video Bandwidth	Should Support Minimum 600 Mbps		
59	Incoming Picture Bandwidth	Should Support Minimum 200 Mbps		
60	Total Outgoing Bandwidth	Should Support Minimum 600 Mbps		
61	Outgoing Video Bandwidth	Should Support Minimum 600 Mbps		
62	Outgoing Picture Bandwidth	Should Support Minimum 200 Mbps		

63	Total Storage Bandwidth	Should Support Minimum 600 Mbps		
64	Video Storage Bandwidth	Should Support Minimum 600 Mbps		
65	Picture Storage Bandwidth	Should Support Minimum 200 Mbps		
66	Prerecording Bandwidth for Alarm Recordings	Should Support Minimum 400 Mbps		
67	Maximum Capacity of Central Storage (IPSAN)	Should Support Minimum 400 TB, depending upon server capacity		
68	Total Events	Should Support Minimum 100 per second		
69	Storage of Events or Alarms without Pictures	Should Support Minimum40 per second		
70	Alarms with Snapshots (Stored on Devices)	Should Support Minimum20 per second		
71	Removed			
Client Workstation PC				

Sl. No	**Feature**	**Technical Specification**	**Specification (Quoted / Applicable – by the bidder)**	**Complied (Yes / No)**
1	Form factor	Tower Type		
2	Operating System	Win 11 SL/ Home 64 bit		
3	Processor & Chipset	Intel i7 12700/ AMD Ryzen 7 5700 or higher; Intel Q670/ AMD Pro 565 or higher		
4	RAM	32 GB DDR4 RAM		
5	Graphics Card	Minimum 4 GB		
6	Storage	512GB NVMe SSD or higher		
7	Power Supply	Min. 400W with 90% or higher efficiency		
8	I/O	Wireless Keyboard and Wireless Mouse, WiFi + BT, Total 10 USB ports, HDMI, DP/ VGA port		
9	Certifications	ISO 9001, 14001, 20001, 27001, EPEAT Gold, ROHS, CE, FCC, UL		
8 Ethernet Port PoE Switch				
Sl. No	**Technical Specification**		**Specification (Quoted / Applicable – by the bidder)**	**Complied (Yes / No)**
1	No of Ports	8 10/100/1000 Base-T PoE ports & 2 Gigabit SFP ports		
2	Switching Capacity	20 Gbps or Better		
3	Forwarding Rate	Minimum 14.80 Mbps		
4	POE / POE+	IEEE 802.3af and 802.3at		

5	POE Power Budget	Minimum 130 W or Higher		
6	Power Supply	AC: 100V -240V, 50Hz ±10%		
7	Environment	Operating temperature/ Humidity: 0°C-45°C, 10%-90% non-condensation		
		Storage temperature/ Humidity: 0°C-70°C; 5%-95% non-condensation		
		Power Saving by: Link status, LED or Port Shutoff		
8	MAC Switching	Static configuration and dynamically learning of MAC address		
		Check and delete MAC address		
		Configuring of MAC address aging time		
		Up to 256 Static MAC entries		
		Limit on MAC address learning number		
		MAC address filtering function		
		MAC address size 8K		
9	Port Mirroring	One-to-One, Many-to-One		
		Supports Mirroring for Tx/Rx/Both		
10	V LAN	4K VLAN entries, 256 static VLAN		
		GVRP		
		1:1 and N:1 VLAN Mapping		
		Q-in-Q		
		Private VLAN, Voice VLAN		
11	STP	802.1D (STP), 802.1W (RSTP), 802.1S (MSTP)		
		BPDU protection, root protection and ring protection		
12	Multicast	IGMP v1/v2/v3		
		IGMP Snooping		
		IGMP Fast Leave		
		Multicast group policy and multicast number limit		
13	IPv6	ICMPv6, DHCPv6, ACLv6 and IPv6 Telnet		
		IPv6 Neighbor Discovery		
		MLD v1/v2		
		MLD Snooping		
14	QoS	Traffic classification of each field of L2/L3/L4 protocol		

		headers		
		CAR traffic control		
		802.1P/DSCP priority remark		
		Multiple queuing algorithms such as SP, WRR or SP+WRR		
		WRED		
		Traffic supervision and traffic shaping		
15	Security features	Identification and filtering of L2/L3/L4 based ACL		
		DOS or TCP attacks Prevention		
		Suppression of broadcast, multicast and unknown unicast packet		
		Port isolation		
		Port security, IP+MAC+port binding		
		DHCP Snooping, DHCP Option 82		
		IEEE 802.1x certification		
		Radius and Tacacs+		
16	Reliability	Static / LACP link aggregation		
17	Management and Maintenance	Console, Telnet, SSH 2.0		
		WEB based management		
		SNMP v1/v2/v3		
		TFTP		
		RMON		
18	Certification	CE, FCC, IEC 62368-1		
19	Make / Brand	Any globally reputed Manufacturer presence in India.		

17U Floor Mount Standing Rack			
Sl. No	Technical Specification	Specification (Quoted / Applicable - by the bidder)	Complied (Yes/No)
1	19", 17U x 600mm width x 800mm depth Floor Standing Networking Rack		
2	It should confirm to DIN 41494 or equivalent ISO standard		
3	It should be welded construction with steel frame		
4	Single Lockable tough end glass front door		
5	Vented metal door at the back, Vented side panels		
6	Powdered coated standard finish		

7	4 sets of casters wheel			
8	4 sets of adjustable levelers			
10	Horizontal Cable Manager			
11	OEM should have valid ISO 9001, ISO 14001 & ISO 45001:2018 certified for design and development of LAN and WAN products, all the relevant certificates must be submitted along with the bid.			
12	Mounting Hardware set			
13	At least 2nos. Of FANs (180CFM) for cooling purpose			
14	Make / Brand	Any globally reputed Manufacturer presence in India.		

12U Wall Mount Indoor Rack			
Sl. No	Technical Specification	Specification (Quoted / Applicable - by the bidder)	Complied (Yes/No)
1	12U, 19" 600mm Width, 600mm Depth, Wall Mount Networking Enclosure.		
2	It should confirm to DIN 41494 or equivalent standard		
3	It should be welded /CKD construction with steel frame		
4	Lockable tough ended glass front door.		
5	19" mounting angle made of formed steel		
6	Powdered coated standard finish		
7	Top & Bottom welded cover with vented & cable entry exit cut outs.		
8	2 pair of 19" mounting rails.		
9	1U Cable Manager.		
10	Roof Mounted Fan Unit (2Nos.).		
11	230V AC, 6 way, 5/15 Amp Power Distribution Unit		
12	Mounting Hardware		
13	OEM should have valid ISO 9001 & ISO 14001 & ISO 45001 for design & development of networking products. Documents need to be submitted along with the tender.		

Smart Managed Switch`

Sl no.	Feature	Technical Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	Interfaces	Should have 24 x 10/100/1000BASE-T ports, 4 x 100/1000 Mbps GbE/SFP combo ports from day one.		
2	Port Standards & Functions	Ports 1 to 24 should compliant with IEEE 802.3ab		
3	Other Port Standards & Functions	Must support IEEE 802.3i 10BASE-T Ethernet (twisted-pair copper) • IEEE 802.3u 100BASE-TX Fast Ethernet (twisted-pair copper) • IEEE 802.3ab 1000BASE-T Gigabit Ethernet (twisted-pair copper) • Auto-negotiation • IEEE 802.3x Flow Control • IEEE 802.3z 1000BASE-X Gigabit Fiber		
4	Full/Half-Duplex	• Full/half-duplex for 10/100 Mbps speeds • Full-duplex for 1000 Mbps speed		
5	Media Interface Exchange	Auto MDI/MDIX adjustment for all twisted-pair ports		
6	Switching Capacity	Minimum 56 Gbps		
7	Forwarding Method	Store-and-forward		
8	MAC Address Table Size	Minimum 8K entries		
9	MAC Address Update	Up to 256 static MAC entries		
10	64-byte Max. Forwarding Rate	Minimum 41.7 Mpps		
11	CPU Memory	Minimum 128 MB DDR3		
12	Packet Buffer	Minimum 4.1 Mbits		
13	Flash Memory	Minimum 32 MB		
14	MTBF	Minimum 992,594 hours		
15	Power Surge Protection	Minimum 6KV surge protection		
16	Operating Temperature	0 to 50 °C		
18	Operating Humidity	10% to 90% non-condensing		
19	All Core switches should be from same make.			

All SFP Core Switch

Sl. No	Technical Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	Layer-3 Fully Managed Switch having 24x 1G SFP slots with 4x combo 10/100/1000BaseT ports & 4x 10G SFP+ slots.		
2	SFP slots should support IEEE 802.3z & IEEE 802.3u compliant transceivers & SFP+ slots should support IEEE 802.3z & IEEE 802.3ae compliant transceivers		
3	The switch should be 19" Rack Mount size.		
	THE SWITCH SHOULD HAVE FOLLOWING BASIC FEATURE FROM DAY ONE:		
4	The switch should have RJ45/mini-USB console port for Out of band CLI management & ethernet port for out of band IP management. It should have minimum one alarm port.		
5	The switch should have intelligent fans with sensor that provides different fan speed based on different temperature.		
6	The switch should have support for redundant power supply.		
7	The switch should have built-in hardware feature for both external event detection & alarm action		
8	The switch should have switching capacity at least 128Gbps & packet forwarding rate at least 95Mpps for 64-bytes packet size		
9	The switch should have non-blocking architecture & wire-speed performance under fully loaded condition.		
10	The switch should have virtual stacking capability of at least 25 switches in a stack.		
11	The switch should have physical stacking capability with at least 8 units per stack & at least 40Gbps of stacking bandwidth.		
12	The switch should have feature for flexible management of switch resources		
13	The switch should have 6kV Surge protection on all RJ45 access ports		
	THE SWITCH SHOULD HAVE FOLLOWING LAYER-2 FEATURE FROM DAY ONE:		
14	a) At least 64K MAC address table size. At least 1K static MAC support.		
15	b) Jumbo frame support for at least 12KB frame size.		
16	c) Flow-control features: 802.3x for full duplex & Head-of-line blocking prevention.		
17	d) UDLD or equivalent features.		
18	e) IEEE 802.1D (STP), 802.1w (RSTP) & 802.1s (MSTP) with at least 64 MSTP instances, Root Guard or equivalent features.		
19	f) Avoidance of the loop occurring in a single port connected to an unmanaged switch/hub by shutting down the corresponding port or corresponding VLAN		
20	g) Ethernet Ring Protection Switching (ERPS) with maximum 50milli second recovery time.		

21	h) IEEE 802.1AX & 802.3ad Link aggregation with at least 32 groups per device & at least 8 ports per groups. LACP.		
22	i) Port mirroring with at least 4 mirroring sessions. Should support Tx, Rx & both based mirroring. Should support		
	one-to-one & many-to-one mirroring, flow-based mirroring, RSPAN.		
23	j) IGMP v1 v2 & v3 snooping with at least 8000 snooping groups. Should support IGMP snooping per VLAN, host-based IGMP snooping fast leave, at least 128 static IGMP groups, L2 multicast filtering		
24	k) MLD v1 & v2 snooping with at least 4000 snooping groups. Per VLAN MLD snooping. At least 128 static MLD groups.		
25	l) At least 4K VLAN groups, 802.1Q, 802.1v protocol based VLAN, Q-in-Q, GVRP with at least 4K dynamic VLANs, Voice VLAN, Port-based VLAN, MAC-based VLAN, private VLAN, VLAN trunking, MVR (Multicast VLAN Registration) or equivalent feature.		
	THE SWITCH SHOULD HAVE FOLLOWING LAYER-3 FEATURE FROM DAY ONE:		
26	a) At least 16K routing table entry size with at least 512 static route entry support.		
27	b) Default route, RIPv1, RIPv2, RIPng, OSPFv2, OSPFv3, BGPv4, BGPv4+, Policy based route, Route preference, Route Redistribution, Bidirectional Forwarding Detection, MSDP		
28	c) Multicast forwarding table size: at least 2000, IGMPv1v2v3, MLDv1v2, IGMP filtering, static IP multicast route, PIM-DM, PIM-SM, PIM-SSM, PIM-Sparse-Dense mode, DVMRPv3, PIM-SMv6.		
29	e) IPv6 tunnelling, VRRP, IP helper		
	THE SWITCH SHOULD HAVE FOLLOWING QOS FEATURE FROM DAY ONE:		
30	a) IEEE 802.1p, DSCP, at least 8 queues per port.		
31	b) Queue handling methods: strict, weighted round robin, weighted deficit round robin, WRED		
32	c) CoS & classification of packets based on following parameters: VLAN ID, 802.1p priority, MAC address, Ether type, DSCP, protocol type, IPv4 address, TCP/UDP port number, IPv6 address, IPv6 traffic class		
33	d) Port & flow based bandwidth control with minimum granularity 8Kbps.		
34	e) Time based QoS.		
	THE SWITCH SHOULD HAVE FOLLOWING SECURITY FEATURE FROM DAY ONE:		
35	a) Access control list based on VLAN, MAC address, 802.1p priority, DSCP, protocol type, TCP/UDP port, IPv4 address, IPv6 address, IPv6 traffic class		
36	b) Time based ACL.		
37	c) Binding of IP address & MAC address with the interface. Dynamic ARP Inspection. IP Source Guard. DHCPv6 Guard, IPv6 Route Advertisement Guard, IPv6 Neighbour Discovery Inspection, Duplicate Address Detection		
38	d) SSHv2 for both IPv4 & IPv6, SSL (TLS 1.2) for both IPv4 & IPv6, Port security with at least 12K MACs per port.		
39	e) Broadcast, multicast & unicast storm control.		

40	f) Protection of the CPU from protocol control packet attack.		
41	g) DHCP server screening, DHCP client filtering, ARP spoofing prevention, BPDU attack prevention, DoS attack prevention		
42	h) IEEE 802.1x -- RFC 3580, web-based access control, MAC based access control, guest VLAN, Microsoft NAP, RADIUS accounting.		
43	i) Authentication supported based on : Local data base, RADIUS server		
44	j) Web based access control for IPv6		
45	k) At least 4 level user account for management access. RADIUS & TACACS+ authentication for management access.		
	THE SWITCH SHOULD HAVE FOLLOWING MANAGEMENT FEATURE FROM DAY ONE:		
46	a) Web based -GUI (IPv4 & IPv6), CLI, telnet server & client (IPv4 & IPv6) , TFTP client (IPv4 & IPv6), FTP client (IPv4 & IPv6), SFTP server, Zmodem, SNMPv1v2cv3, Syslog. sFlow, ICMPv6.		
47	b) RMONv1 & v2, LLDP, LLDP-MED, BooTP & DHCP client supporting both IPv4 & IPv6, DHCP relay option 82, DHCP relay option 60 & 61.		
48	c) Multiple images & configurations, SNTP, debug		
49	d) 802.3ah ethernet link OAM, 802.1ag CFM, Dying gasp.		
50	e) Inbuilt power saving technique on all Gigabit RJ-45 ports, IEEE 802.3az		
51	Secure Product Development Lifecycle Process Requirement Certification in accordance with IEC 62443-4-1: 2018 standard for cyber security capability		
52	All type of switches & transceivers should be from same make.		
53	All Core switches should be from same make.		

Copper Core Switch

Sl. No	**Technical Specification**	**Specification (Quoted / Applicable – by the bidder)**	**Complied (Yes / No)**
1	Core Switch - Layer-3 Fully Managed Switch having 20 X 1Gbps Copper Ports with 4x combo 1G SFP slots & 4x 10G SFP+ slots		
2	SFP slots should support IEEE 802.3z & IEEE 802.3u compliant transceivers & SFP+ slots should support IEEE 802.3z & IEEE 802.3ae compliant transceivers		
3	The switch should be 19" Rack Mount size.		
	THE SWITCH SHOULD HAVE FOLLOWING BASIC FEATURE FROM DAY ONE:		
4	The switch should have RJ45/mini-USB console port for Out of band CLI management & ethernet port for out of band IP management. It should have minimum one alarm port.		
5	The switch should have intelligent fans with sensor that provides different fan speed based on different temperature.		
6	The switch should have support for redundant power		

	supply.		
7	The switch should have built-in hardware feature for both external event detection & alarm action		
8	The switch should have switching capacity at least 128Gbps & packet forwarding rate at least 95Mpps for 64-bytes packet size		
9	The switch should have non-blocking architecture & wire-speed performance under fully loaded condition.		
10	The switch should have virtual stacking capability of at least 25 switches in a stack.		
11	The switch should have physical stacking capability with at least 8 units per stack & at least 40Gbps of stacking bandwidth.		
12	The switch should have feature for flexible management of switch resources		
13	The switch should have 6kV Surge protection on all RJ45 access ports		
	THE SWITCH SHOULD HAVE FOLLOWING LAYER-2 FEATURE FROM DAY ONE:		
14	a) At least 64K MAC address table size. At least 1K static MAC support.		
15	b) Jumbo frame support for at least 12KB frame size.		
16	c) Flow-control features: 802.3x for full duplex & Head-of-line blocking prevention.		
17	d) UDLD or equivalent features.		
18	e) IEEE 802.1D (STP), 802.1w (RSTP) & 802.1s (MSTP) with at least 64 MSTP instances, Root Guard or equivalent features.		
19	f) Avoidance of the loop occurring in a single port connected to an unmanaged switch/hub by shutting down the corresponding port or corresponding VLAN		
20	g) Ethernet Ring Protection Switching (ERPS) with maximum 50milli second recovery time.		
21	h) IEEE 802.1AX & 802.3ad Link aggregation with at least 32 groups per device & at least 8 ports per groups. LACP.		
22	i) Port mirroring with at least 4 mirroring sessions. Should support Tx, Rx & both based mirroring. Should support one-to-one & many-to-one mirroring, flow-based mirroring, RSPAN.		
23	j) IGMP v1 v2 & v3 snooping with at least 8000 snooping groups. Should support IGMP snooping per VLAN, host-based IGMP snooping fast leave, at least 128 static IGMP groups, L2 multicast filtering		
24	k) MLD v1 & v2 snooping with at least 4000 snooping groups. Per VLAN MLD snooping. At least 128 static MLD groups.		
25	l) At least 4K VLAN groups, 802.1Q, 802.1v protocol based VLAN, Q-in-Q, GVRP with at least 4K dynamic VLANs, Voice VLAN, Port-based VLAN, MAC-based VLAN, private VLAN, VLAN trunking, MVR (Multicast VLAN Registration) or equivalent feature.		
	THE SWITCH SHOULD HAVE FOLLOWING LAYER-3 FEATURE FROM DAY ONE:		
26	a) At least 16K routing table entry size with at least 512		

	static route entry support.		
27	b) Default route, RIPv1, RIPv2, RIPng, OSPFv2, OSPFv3, BGPv4, BGPv4+, Policy based route, Route preference, Route Redistribution, Bidirectional Forwarding Detection, MSDP.		
28	c) Multicast forwarding table size: at least 2000, IGMPv1v2v3, MLDv1v2, IGMP filtering, static IP multicast route, PIM-DM, PIM-SM, PIM-SSM, PIM-Sparse-Dense mode, DVMRPv3, PIM-SMv6.		
29	e) IPv6 tunnelling, VRRP, IP helper		
	THE SWITCH SHOULD HAVE FOLLOWING QOS FEATURE FROM DAY ONE:		
30	a) IEEE 802.1p, DSCP, at least 8 queues per port.		
31	b) Queue handling methods: strict, weighted round robin, weighted deficit round robin, WRED		
32	c) CoS & classification of packets based on following parameters: VLAN ID, 802.1p priority, MAC address, Ether type, DSCP, protocol type, IPv4 address, TCP/UDP port number, IPv6 address, IPv6 traffic class		
33	d) Port & flow based bandwidth control with minimum granularity 8Kbps.		
34	e) Time based QoS.		
	THE SWITCH SHOULD HAVE FOLLOWING SECURITY FEATURE FROM DAY ONE:		
35	a) Access control list based on VLAN, MAC address, 802.1p priority, DSCP, protocol type, TCP/UDP port, IPv4 address, IPv6 address, IPv6 traffic class		
36	b) Time based ACL.		
37	c) Binding of IP address & MAC address with the interface. Dynamic ARP Inspection. IP Source Guard. DHCPv6 Guard, IPv6 Route Advertisement Guard, IPv6 Neighbor Discovery Inspection, Duplicate Address Detection		
38	d) SSHv2 for both IPv4 & IPv6, SSL (TLS 1.2) for both IPv4 & IPv6, Port security with at least 12K MACs per port.		
39	e) Broadcast, multicast & unicast storm control.		
40	f) Protection of the CPU from protocol control packet attack.		
41	g) DHCP server screening, DHCP client filtering, ARP spoofing prevention, BPDU attack prevention, DoS attack prevention		
42	h) IEEE 802.1x -- RFC 3580, web-based access control, MAC based access control, guest VLAN, Microsoft NAP, RADIUS accounting.		
43	i) Authentication supported based on : Local data base, RADIUS server		
44	j) Web based access control for IPv6		
45	k) At least 4 level user account for management access. RADIUS & TACACS+ authentication for management access.		
	THE SWITCH SHOULD HAVE FOLLOWING MANAGEMENT FEATURE FROM DAY ONE:		
46	a) Web based -GUI (IPv4 & IPv6), CLI, telnet server & client (IPv4 & IPv6) , TFTP client (IPv4 & IPv6), FTP client (IPv4 & IPv6), SFTP server, Zmodem, SNMPv1v2cv3,		

	Syslog. sFlow, ICMPv6.		
47	b) RMONv1 & v2, LLDP, LLDP-MED, BooTP & DHCP client supporting both IPv4 & IPv6, DHCP relay option 82, DHCP relay option 60 & 61.		
48	c) Multiple images & configurations, SNTP, debug		
49	d) 802.3ah ethernet link OAM, 802.1ag CFM, Dying gasp.		
50	e) Inbuilt power saving technique on all Gigabit RJ-45 ports, IEEE 802.3az		
51	Secure Product Development Lifecycle Process Requirement Certification in accordance with IEC 62443-4-1: 2018 standard for cyber security capability		
52	All type of switches & transceivers should be from same make.		
53	All Core switches should be from same make.		

600 VA Offline UPS

Feature		**Technical Specification**	**Specification (Quoted / Applicable – by the bidder)**	**Complied (Yes / No)**
INPUT	Voltage	220/230 VAC		
	Voltage Range	140-300 VAC		
	Frequency Range	50 Hz		
OUTPUT	AC Voltage Regulation (Battery Mode)	±10%		
	Frequency Range (Battery Mode)	50 Hz ±1 Hz		
	Transfer Time	Typical 2-6 ms		
	Waveform (Battery Mode)	Simulated Sine Wave		
	Overload	110% +/-10% Shutdown after 5 minutes		
BATTERY	Battery Type & Number	12 V/7 Ah x 1		
	Typical Recharge Time	6-8 hours up to 90% capacity		
TRANSFER TIME	Minimum line break for transfer to battery	Typical 4-8 msec		
INDICATORS	AC Mode	Green lighting		
	Battery Mode	Green flashing		
	Fault	Red lighting		
ALARMS	Battery Mode, Low Battery, Overload, Battery replacement, fault	Audible alarm		
PROTECTION	Full Protection	Overload, discharge, and overcharge protection		

ENVIRONMENT	Operating Environment	0-40 Deg C.		
	Storage Temp	-15℃ to 50℃		
	Humidity	0-95 % RH @ 0- 40°C (non-condensing)		
	Noise Level	Less than 40dB		
Test reports	BIS registration	Require		
	NABL Approved government lab test report.	Require		

Make / Brand : Any globally reputed Manufacturer presence in India

3 KVA Online UPS `

Sl. No.	Feature	Technical Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	Capacity	3kVA/2.4 kW.		
2	Design	True online double conversion design		
Input Characteristics.				
3	Nominal Input Voltage	230Vrms		
4	Nominal Input Frequency	50Hz.		
5	Input Power Factor	0.99		
6	Type of Rectifier	IGBT Based PWM Rectifier		
7	Input Voltage Range	110 VAC to 300 VAC		
8	Voltage Detection Tolerance ±3% Calibration	±3% Calibration		
9	Input Frequency Range	40-70Hz		
10	Inrush Limitation	7*IRMS_Nom		
11	Current Protection	With Fuse.		
Battery Parameters.				
12	Charging Method	Constant voltage constant current (CVCC)		
13	Charging current Capacity	Settable 1/2/4/6		
14	Type of Batteries	SMF VRLA, Li-ion, Tubular		
15	Back up time	2 Hours		
16	Minimum VAH required	4680		
17	Maximum Battery Leakage Current	500uA		

18	Charge Voltage Accuracy	±1%		
Output Parameters.				
19	Load power factor	0.8		
20	Nominal Output voltage	208/ 220/ 230/ 240 VAC Settable		
21	Output Frequency	Frequency Range (Battery Mode): 50 Hz ± 0.1 Hz; Frequency Range (Synchronized Range): 46Hz ~ 54 Hz @ 50Hz system		
22	Output Waveform	Pure sine wave		
23	Total Harmonic distortion (THD)	Less than 3% for Linear Load and Less than 6% for RCD Load		
24	Inverter	IGBT based PWM with Instantaneous Sine wave control		
25	Power Rating	3kVA/2.4 kW.		
26	Dynamic response	IEC62040-3 Classification 1		
27	Crest factor	3:1		
28	Duty.	Continuous duty		
29	Overload Capacity	AC mode:105%~110%: 10min、110%~130%: 1min、>130% : 1sec ;		
30	Frequency synchronization Band for Static. Bypass	46 - 54Hz		
31	Transfer (Inverter to Bypass)	0 ms		
32	Retransfer (Bypass to Inverter)	0 ms		
33	Automatic Bypass	Inbuilt		
34	Overall efficiency (AC to AC)	90%.		
Miscellaneous Function				
35	Intelligent Fans Speed Control	Require		
36	Auto Restart Function	Require		
Physical and Environmental Characteristics.				
37	Acoustic Noise Level	Less than 58dB @ 1 Meter		
38	Ambient Temperature	0 - 50 Deg C		
39	Storage Temperature	-15°C~60°C		
40	Humidity	<95 % and non-condensing		
41	Altitude	<1000m		
42	Enclosure Protection Grade	IP 20		
43	Cooling	Forced Air		
Metering (Digital display)				
44	Input voltage	Advanced LCD based		

45	Battery voltage	Display System, able to monitor Input Voltage/Battery Voltage/ Output Voltage / Output Frequency/ Input Frequency/ Ambient Temperature.		
46	Output voltage			
47	Output current			
48	Output frequency			
49	Input Frequency			
50	Heat sink temperature			
Fault indicated on Digital Display Alarms		LED indication display		
51	input fail	Inbuilt and accessible on LCD Display.		
52	Battery Low			
53	Transfer to bypass and system fault			
54	LED Indications			
55	Protection	Overload/ Short Circuit/ Battery Deep Discharge/ Low Battery/ Reverse Battery/ Inverter Current Limitation/ Over Temperature/ Output Overvoltage.		
56	Optional features	RS 232 communication port for interfacing, Remote monitoring		
Standards				
57	Low freq Conducted disturbance	IEC61000-2-2		
Other Standards				
58	Continuous Electromagnetic Susceptibility	IEC 61000-4-3		
59	Electrical Fast Transient Compatibility	IEC 61000-4-4		
60	Surge	EN 61000-4-5: 2005		
61	CRFI	IEC61000-4-6		
62	Magnetic Field Immunity	IEC 61000-4-8		
63	Transportation	IEC 60068-2-32,IEC 60068-2-64,IEC 60068.2-27		
64	Protection	IP-20		
65	NABL approved Government lab test certificate	Require		
66	ISO certifications	ISO 9001, ISO14001, ISO27001, ISO 45001:2018		
67	BIS registration	Require		

Make / Brand : Any globally reputed Manufacturer presence in India

UTM Firewall Hardware Device

Hardware Platform:	**Specification (Quoted / Applicable – by the bidder)**	**Complied (Yes / No)**
• No built-in mechanical moving parts.		
• Should be Hardened OS based firewall		
• Should have flash based configuration storage with NO built in HDD		
The firewall should 5 x 1GbE RJ45 connectors, 1000 Base-TX (10/100/1000Mbps). 2 USB 3.0, 1 RJ45 RS232 console port. Wireless Radio Type and Frequency Band, 2x2 802.11ax Wi-Fi 6 dual band radios, 2.4 GHz: Data rates up to 573 Mbps, 5 GHz: Date rates up to 1.2 Gbps		
• Memory/Flash : RAM: DDR4 4GB, eMMC 4GB Storage Power supply - Input Ratings: 100-240V AC, 0.9A Max, 50-60Hz. Output Ratings: 12V DC, 2.5A, Power Consumption - 25 Watts		
Following IP Address Assignment should be supported by the device:		
• Static		
• PPPoE Client		
• DHCP Client		
Firewall should support internal DHCP Server		
Firewall should be able to act as DHCP Relay Agent		
Performance:		
The firewall should support minimum 3.14 Gbps Gbps Firewall throughput		
The firewall should support minimum 403 Mbps UTM(fullscan) throughput		
The firewall should support minimum 1.02 Gbps VPN (UDP 1518) throughput		
The firewall should support minimum 472 Mbps GAV throughput		
The firewall should support minimum 525 Mbps IPS (fullscan) throughput		
The firewall should support minimum 1,300,000 concurrent sessions(Bidirectional)		
New session per second should me minimum 16,000		
Authentication servers/processes:		
Support for user authentication services such as Active Directory, LDAP, RADIUS, Secure ID, Digital certificates, Local user group authentications.		
Should Support Single-Sign-On Feature		
Should be able to support Terminal Services client / Citrix Client		
Networking:		
Firewall should support port independence		
Firewall should support Link Failover (Active - Active and Active - Passive)		
Firewall should be able to operate in Routing mode or Bridge		

(Transparent) mode		
Should support automatic WAN failover as well as load sharing for outbound traffic.		
Should be able to support VPN Failover		
Should support Server Load Balancing		
Firewall must support VLAN Tagging (IEEE 802.1Q)		
Should support Policy-Based Routing		
Firewall should support Dynamic Routing (RIP v1 & v2, OSPF & BGP)		
The Firewall must provide NAT functionality, including dynamic and static NAT translations.		
Firewall should be able to support Port Forwarding.		
Should have option to configure traffic shaping / QOS		
Compatible to Centralized Management		
The firewall must support Active-Active as well as Active-Passive redundancy.		
Actibve/Active as well as Active/Passive HA Clustering can be achieved		
The cluster should support simple and minimal downtime during upgrade		
Should have option to create ALIASES to identify group of Hosts or networks with one Unique Name		
Should have option to create Customized Aliases based on User/Group , Host IP/IP Range & Interface		
VPN function:		
The VPN should be integrated with firewall and support the full Encryption & other standards and protocols:		
(a) DES, 3DES, AES		
(b) MD5 and SHA-1 authentication		
(c) Diffie-Hellman Group 1, Group 2, Group 5 ,Group14, Group 15, Group 19 and Group 20		
(d) Internet Key Exchange (IKE) algorithm		
(f) The new encryption standard AES 128, 192 & 25 (Advanced Encryption Standard)		
Should support IPSec, PPTP, L2TP & SSL VPN		
Should support 75 Site-to-Site Tunnels (BOVPN)		
Should support minimum 75 Mobile VPN tunnels (IPSec, SSL, L2TP)		
Security:		
Should support Reputation based Cloud Security feature		
Denial of Service (DoS) attacks such as ping of death, syn flood, UDP bomb, Land attack, Smurf, Fraggle and ICMP unreachable		
Should support Auto Blocking of Source IP address based on triggers		
should support real time spam detection & also supports proactive virus detection technology which detects and blocks the new outbreaks immediately and accurately.		
The following actions should be supported for SMTP traffic		
• Tagging		

• Drop		
• Deny		
• Quarantine		
Should support of blocking attachments based of file names or extension		
Should support of blacklisting / whitelisting		
Should support Language independent anti-spam solution		
Advance Recurring Pattern Detection - anti-spam technology, that rely on RBL and scoring.		
Support for quarantine feature		
Web URL filtering with 100+ category based database, with option to refer Online or can be stored on Local Management Station		
Should be able to define specific URL's to be Allowed/Blocked		
Users should be able to allow blocked website using password override feature		
IPS and AV signature database keep on updating with hourly basis		
Should have a built-in Signature IPS engine on the same unit for IPS		
Should have Server/Client Quota based Distributed Denial of Service Prevention		
Should have the feature to exclude certain hosts' traffic (IP addresses) to be scanned by IPS for particular signatures		
Gateway AV should be supported for real-time detection of viruses and malicious code for HTTP, HTTPS, FTP, SMTP, POP3, SIP.		
Should have configurable policy options to select what traffic to scan for viruses		
Should support Application control for Web 2.0 applications		
Should not have inhouse security services for AV, IPS, Antispam		
Administration:		
Dedicated Application based GUI management program for robust configuration and management.		
Option for Remote management, through WEBUI, CLI & Secure Management Software		
Administrative TCP/IP ports should be other than TCP 80 and TCP 443 to prevent brute-force attack.		
Should support only single administrative login for integrity purpose and deny consecutive administrative login attempts		
Support for role based administration of firewall		
Configurable connection timeout for the management interface.		
Real-time network connection map for connection status.		
Drag-and-drop VPN configuration capability.		
Comprehensive reporting suite without any additional cost.		
Offline policy files configuration and modification.		
The Firewall must send SNMP traps to Network Management Servers (NMS) in response to System failures.		
Ability to make a full backup of the entire flash disk as image file.		
Ability to make/edit configuration file offline for better administrative management, without connecting to the operating security device.		
Should have option to Change Default Web UI Port		

Should have option to schedule rebooting		
Monitoring, Logging and Reporting		
Live Traffic Monitor		
Real-time reporting with Drill Down Feature		
System Services Status Monitor		
Authenticated User List Monitor		
VPN Connections Monitoring		
IP/Host/User based Traffic Watch with option Block Source/Destination from the monitoring tool itself		
Protocol based Traffic Watch		
PDF Audit Reporting		
Remote Logging Support		
Remote Reporting Support		
Remote Monitoring Support		
Encrypted Log Channel		
Provision to generate automatic alerts via mails / syslog		
The Firewall must send SNMP traps to Network Management Servers (NMS) in response to System failures.		
Multi-Appliance Log Aggregation		
Logging and reporting solution should be provided at no extra cost and shouldn't need any license renewal		
1 day of data (reports) retention should be provided at no extra cost on cloud		
Make / Brand : Any globally reputed Manufacturer presence in India		

49" DISPLAY

Sl. No	Section	Feature	Technical Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	Panel	Screen Size	49" or higher		
2		Panel Technology	IPS or VA		
3		Aspect Ratio	16:09		
4		Native Resolution	3,840 x 2,160 (UHD)		
5		Backlight Unit Type	Edge		
6		Brightness (cd/m2)	500nit or higher		
7		Dynamic Contrast Ratio	1,000,000:1 or higher		
8		Viewing Angle (H x V)	178 x 178 or higher		
9		Response Time	8ms(G to G) or better		
10		Surface Treatment (Haze)	Haze 28% or higher		
11		Operation Hours	24x7 Hrs		
12		Orientation	Landscape & Portrait		
13	Connectivity	Input	HDMI (3), DP, DVI-D, Audio, USB (2)		

14		Output	HDMI/DP, Audio		
15		External Control	RS232C In/out, RJ45 (LAN) In, IR In		
16	Specification	VESA	200 x 200 or as per OEM		
17	Key Feature	CPU-ARM Cortex-A53 1.1 GHz Quad, RAM-2GB DDR3-2133 (64bit), Memory- 16GB, GPU-ARM Mali-T820 MP2 (650MHz), Built-in Wi-Fi, Temperature Sensor, Auto Brightness sensor, Acceleration(Gyro) Sensor, Local Key Operation, Embedded CMS, USB Plug & Play, Fail over, Background Image, Sync Mode, Multi-screen (PIP, PBP (4)), Screen Share, Play via URL, Rotation (Screen Rotation, External Input Rotation), Gapless Playback, Tile Mode Setting (Max. 15 × 15), Setting Data Cloning, SNMP, Control Manager, 3rd Party Compatibility (Creston Connected), Power (Smart Energy Saving, PM mode, Wake on LAN, Beacon, HDMI-CEC			
18	Environmental	Operation Temperature	0°C to 40°C		
19	Conditions	Operation Humidity	10% to 80%		
20	Power	Power Supply	100-240V~, 50/60Hz		
21		Power Type	Built-In Power		
22		Consumption: Smart Energy Saving / Max.	100W / 140W		
23	Software	Content Management Software	SuperSign CMS		
24	Compatibility	Control and Monitoring Software	SuperSign Control / Control+		
25	Certification	Safety	CB		
26		EMC	FCC Class "A" / CE / KC		
27		ErP / Energy Star	Yes / Yes		
28	Special Feature	Tilt (Facedown)	Max. 15°		
29		IP Rating	IP5x		

42U Floor Mount Standing Rack

Sl. No	Technical Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	19", 42U x 800mm width x 1000mm depth Floor Standing Networking Rack		

2	It should confirm to DIN 41494 or equivalent ISO standard		
3	It should be welded construction with steel frame		
4	Single Lockable tough end glass front door		
5	Vented dual metal door at the back, Vented side panels		
6	Powdered coated standard finish		
7	4 sets of casters wheel		
8	4 sets of adjustable levellers		
9	Horizontal Power Distribution Unit with 12 x 5/15A sockets Round Pin, 230 Volts AC, 32 Amp with Plug		
10	Horizontal Cable Manager		
11	Mounting Hardware set		
12	At least 4nos. Of FANs (360CFM) for cooling purpose		
13	Make / Brand : Any globally reputed Manufacturer presence in India		

27U Floor Mount Standing Rack

Sl. No	Technical Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	19", 27U x 800mm width x 800mm depth Floor Standing Networking Rack		
2	It should confirm to DIN 41494 or equivalent ISO standard		
3	It should be welded construction with steel frame		
4	Single Lockable tough end glass front door		
5	Vented dual metal door at the back, Vented side panels		
6	Powdered coated standard finish		
7	4 sets of casters wheel		
8	4 sets of adjustable levellers		
10	Horizontal Cable Manager		
11	Mounting Hardware set		
12	At least 2nos. Of FANs (180CFM) for cooling purpose		
13	Make / Brand : Any globally reputed Manufacturer presence in India		

24 Port LIU

Sl. No	Technical Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	24 Port Rack Mount LIU Fully Loaded with Single Mode LC Adapters and Pigtail (1 mtr)		
2	Aluminum & Cold Steel based material with powder coating for light mounting.		
3	Snap-in locker design, easy to change the adapter panels		
4	Should manage both splices and terminations		
5	Should have plastic Splice Tray capable of 24 fibers		
6	Should have 6 fiber magic sticker provision inside for 900um tight buffered fiber storing		
7	Accessory kit consists of cable ties, mounting ear screw		
8	Front-Mounted Cable Saddles for jumper management		

9	Removable Top & Front cover for better access to interior of LIU		
10	Rubber grommet allow for pre-terminated fiber trunk installation, protects cable and minimizes dust build-up		
11	Adapter panel - Cold steel		
12	Adapters should have compact design & high precision		
13	which perform well under various circumstances & maintain good plug retention strength.		
14	All fiber items should be from same make.		
15	Make / Brand : Any globally reputed Manufacturer presence in India		

1Gbps FO Transceiver

Sl. No	Technical Specification		
1	1 Gbps Single Mode Fibre Optic Transceiver (For Core Switch)		
2	1000BASE-LX Single Mode SFP Transceiver with Duplex LC Connector		
3	Support IEEE 802.3z standard		
4	At least 10Km distance support on single mode fiber interface		
5	Transceiver module should be hot pluggable. MSA Compliant		
6	TTL signal detect indicator, Metal enclosure for lower EMI		
7	Operating wavelength: 1310nm		
8	It should be of same make as Core Switches		
9	Secure Product Development Lifecycle Process Requirement Certification in accordance with IEC 62443-4-1: 2018 standard for cyber security capability		
10	All type of switches & transceivers should be from same make.		
11	All Core switches should be from same make.		
12	Make / Brand : Any globally reputed Manufacturer presence in India		

10Gbps FO Transceiver

Sl. No	Technical Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	10 Gbps Single Mode Fiber Optic Transceiver		
2	10GBASE-LR Single Mode SFP+ Transceiver with Duplex LC Connector		
3	Support IEEE 802.3ae standard		
4	At least 10Km distance support on single mode fiber interface		
5	Transceiver module should be hot pluggable. MSA Compliant		
6	Operating wavelength: 1310nm		

7	Secure Product Development Lifecycle Process Requirement Certification in accordance with IEC 62443-4-1: 2018 standard for cyber security capability		
8	All type of switches & transceivers should be from same make.		
9	All Core switches should be from same make.		
10	Make / Brand : Any globally reputed Manufacturer presence in India	.	

LC-LC Fibre Optic Patch Cord

Sl. No	Technical Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	LC - LC SM FO Duplex Patch Cord 5 Meter Length		
	The optical fiber patch cords shall comply with the following specifications:		
2	Optical Fiber – Single mode - OS1		
3	Connector: Zirconia ceramic ferrule		
4	Pre-radiuses and pre-polished ferrule		
5	Duplex Type		
6	Color-coded Yellow for Single mode		
7	Insertion Loss : <0.3 db		
8	Cable: 9/125, SM		
9	Return Loss: >/= 50dB for UPC		
10	Durability: 1000 mating cycle		
11	Working Temp: (0 deg. C to 60 deg. C)		
12	Length: 5 Meter		
13	All fiber items should be from same make.		
14	Make / Brand: Any globally reputed Manufacturer presence in India.		
LC-LC Fibre Optic Patch Cord			

Sl. No	Technical Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	LC - LC SM FO Duplex Patch Cord 2 Meter Length		
	The optical fiber patch cords shall comply with the following specifications		
2	Optical Fiber – Single mode - OS1		
3	Connector: Zirconia ceramic ferrule		
4	Pre-radiuses and pre-polished ferrule		
5	Duplex Type		
6	Color-coded yellow for Single mode		
7	Insertion Loss : <0.3 db		
8	Cable: 9/125, SM		
9	Return Loss: >/= 50dB for UPC		
10	Durability: 1000 mating cycle		
11	Working Temp: (- 10 deg. C to + 60 deg. C)		
12	Length: 2 Meter		

13	All fiber items should be from same make.		
14	Make / Brand: Any globally reputed Manufacturer presence in India.		
UTP CAT-6 Outdoor Cable			
Sl. No	**Technical Specification**	**Specification (Quoted / Applicable – by the bidder)**	**Complied (Yes / No)**
1	Category 6 Outdoor cable shall be compliant with ANSI/TIA/EIA-568-C.2 & and ISO/IEC 11801 channel performance up to 85 mtr.		
2	Category 6 Outdoor cable shall be capable of enhanced performance for transmission of high-speed data, digital and analogue voice and video (RGB) signals on LANs.		
3	All Category 6 Outdoor cables shall meet or exceed the following characteristics:		
4	Construction: 4 twisted pairs separated by internal X shaped, 4 channel, full separator. Half shall not be accepted.		
5	Category 6 Outdoor cable shall be UV Resistant		
6	Conductor dia: 23 AWG		
7	Insulation: Polyethylene		
8	Insulation Diameter: 1.04 ± 0.05 mm		
9	Sheath Thickness: 0.5 ± 0.15 mm		
10	Pairing: Two insulated conductor twisted together		
11	No. of Pair: 4 pair separated by a separator		
12	Sequential meter marking should be available		
13	Color of Jacket: Black		
14	Outer Jacket: PE		
15	Inner Jacket: PVC		
16	Filler : Central Slit Film Cross Filler		
17	Outer Diameter: 7.1 mm		
18	BEND RADIUS: 8 X CABLE DIAMETER		
19	Thickness of Inner Jacket: 0.45 mm ± 0.05 mm		
20	Thickness of Outer Jacket : 0.55 mm ± 0.05 mm		
21	Electrical Parameters		
22	CONDUCTOR RESISTANCE (DC): 9.38Ω ohms /100mtr@20˚C. MAX.		
23	RESISTANCE UNBALANCE: 5%MAX		
24	MUTUAL CAPACITANCE: 5.6 nF/100 mtrs MAX.		
25	CAPACITANCE UNBALANCE PAIR/GROUND: 330pF/100M MAX		
26	DELAY SKEW: ≤45 nS/100M		
27	NORMAL VELOCITY OF PROPAGATION: 69%		
28	IMPEDANCE: 100 ± 15% Ω		
29	Temperature Rating: (- 20 to +60 C)		
30	Packing : 305 Mtrs.		
31	Generally confirming to EIA/TIA 568-C.2 and IEC/ISO 11801		
32	All Network Cable should be from same make.		
33	Make / Brand: Any globally reputed Manufacturer presence in India		
6 Core SM 9/125 Outdoor Fibre Optic Armoured Cable			

Sl. No	Technical Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	6 Core Single Mode Outdoor Armored Fiber Optic Cable		
2	Electro Chromium Coated Corrugated Steel Tape (ECCS)		
3	Central loose tube with jelly compound		
4	Sequential meter marking		
5	Armoured Design with Steel music Wire		
6	Outer Diameter: 7.2±0.5mm (for 6 Core Cable)		
7	Thickness of HDPE Jacket: 1.8±0.2mm		
8	Pulling Tension: Short Term (1000N)		
9	Crush Load: 2000N/100mm		
10	Bend Radius: Short Term (20D)		
11	The fiber type is a Matched Cladding Single Mode		
12	The fiber is optimized for operation at 1310 nm and at 1550 nm.		
13	Nominal Mode Field Diameter: 9.3 µm		
14	Cladding Diameter: 125 µm		
15	PMD (ps/km): ≤ 0.2		
16	Cable Cut-off Wavelength: 1260nm		
17	**Attenuation (of cable with fibers):**		
	At 1310 nm: 0.34 dB/km		
	At 1550 nm : 0.24 dB/km		
18	Operating Temperature should be within -20°C to +60°C		
19	Make / Brand: Any globally reputed Manufacturer presence in India.		
12 Core SM 9/125 Outdoor Fibre Optic Armoured Cable			

Sl. No	Technical Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	12 Core Single Mode Outdoor Armored Fiber Optic Cable.		
2	Corrugated steel tape armoured		
3	Central loose tube with jelly compound		
4	Glass Yarns between steel tape & loose tube		
5	Sequencial meter marking		
6	The fiber should fulfill the requirement of ITU-T REC G.652D		
7	Outer Diameter: 9 ± 0.3mm (for 12 Core Cable)		
8	Thickness of HDPE Jacket: 1.8±0.2mm		
9	Pulling Tension: Short Term (2000N)		
10	Crush Load: 3000N/100mm		
11	Bend Radius: (20D)		
12	The fiber type is a Matched Cladding Single Mode		
13	The fiber is optimized for operation at 1310 nm and at 1550 nm.		
14	Nominal Mode Field Diameter: 9.2 µm		
15	Cladding Diameter: 125 µm		
16	PMD (ps/km): 0.2		
17	Cable Cut-off Wavelength: <= 1260nm		

18	Attenuation (of cable with fibers):		
	At 1310 nm: 0.36 dB/km		
	At 1550 nm : 0.22 dB/km		
19	Make / Brand: Any globally reputed Manufacturer presence in India .		

24 Core SM 9/125 Outdoor Fibre Optic Armoured Cable

Sl. No	Technical Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	24 Core Single Mode Outdoor Armoured Fiber Optic Cable.		
2	Corrugated steel tape armoured		
3	Central loose tube with jelly compound		
4	Glass Yarns between steel tape & loose tube		
5	Sequential meter marking		
6	The fiber should fulfill the requirement of ITU-T REC G.652D		
7	Outer Diameter: 9.5 ± 0.3mm (for 24 Core Cable)		
8	Thickness of HDPE Jacket: 1.8±0.2mm		
9	Pulling Tension: Short Term (2000N)		
10	Crush Load: 3000N/100mm		
11	Bend Radius: (20D)		
12	The fiber type is a Matched Cladding Single Mode		
13	The fiber is optimized for operation at 1310 nm and at 1550 nm.		
14	Nominal Mode Field Diameter: 9.2 µm		
15	Cladding Diameter: 125 µm		
16	PMD (ps/km): 0.2		
17	Cable Cut-off Wavelength: <= 1260nm		
18	**Attenuation (of cable with fibers):**		
	At 1310 nm: 0.36 dB/km		
	At 1550 nm : 0.22 dB/km		
19	Make / Brand: Any globally reputed Manufacturer presence in India		
Outdoor Weatherproof Customized Rack			

Sl. No	Feature	Technical Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	Metal Guage	18 SWG or Better		
2	Colour	Off White / Gray / Cream		
3	Colour Coating	Powder Coated		
4	Dimension	As Per Requirement (Weather Proof Design with cooling arrangement)		
	(W X H X D)			
5	Lock Facility	Double Lock facility		
Double Door DB Box				

Sl. No	Feature	Technical Specification		
1	Type	8 Way SPN MCB DB		
2	Enclosure	Double Door with IP42/43 protection		
3	Isolator	1 No. 32 Amp Double Pole (Loaded)		
4	MCB	6 Nos. 10 Amp / 6 Amp Single Pole (loaded)		
5	Supply	Single Phase 250V AC		
6	Brand / Make	Any globally reputed Manufacturer presence in India.		

- Bidder should submit all relevant data sheet/brochure of all quoted items and should also availablein respective OEM's official website.
- Bidder should indicate items mentioned in the OEM data sheet / brochure by marketing as mentioned in minimum specification in the RFP

Authorized Signatory (Signature In full): _____

Name and title of Signatory: _____

Stamp of the Company: _____

Zone – 2 (Bidhannagar)

Minimum Specification of 5 MP IR Vari-Focal Bullet Network Camera

Sl. No	Feature	Technical Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	Image Sensor	1/2.8" CMOS Sensor or Better		
2	Resolution	Minimum 2592 (H) × 1944 (V)		
3	Scanning System	Progressive		
4	Electronic Shutter Speed	Auto/Manual 1/15 s–1/100,000 s		
5	Min. Illumination	0.01 lux@F1.4 (Color) or Better		
		0.01 lux@F1.4 (B/W) or Better		
		0 lux (Illuminator on)		
6	S/N Ratio	>52 dB		
7	IR Illumination Distance	50 meter or Better		
8	Illuminator On/Off Control	Auto / Manual		
9	Lens Type	Motorized vari-focal		
10	Focal Length	OEM fitted 2.8 mm–12 mm or Better		
11	Iris Control	Auto/ Mannual		
12	**Professional, intelligent**			
	IVS (Perimeter Protection)	Support Intrusion, tripwire		
13	Video Compression	H.265+/ H.265/ H.264/ MJPEG		
14	Video Frame Rate	Main stream: 2592 × 1944 @ 30 fps or Better		
		Sub stream 1: D1 @ 30 fps or Better		
		Sub stream 2: 2048 × 1536 @ 8 fps or Better		
15		Sub stream 3: 1980 × 1080 @ 30 fps or Better		
16	Stream Capability	4 streams or Higher		
17	Resolution	2592 × 1944; 2592 × 1520; 2048 × 1536; 1920×1080; 720p; D1; VGA; 2CIF; CIF.		
18	Bit Rate Control	CBR/VBR		
19	Day/Night	Auto(ICR)/Color/B/W		
20	BLC	Should Support		
21	WDR	120 dB or Higher		
22	White Balance	Auto/ Natural/ Street lamp/ Outdoor		
23	Gain Control	Auto		
24	Noise Reduction	3D NR		
25	Motion Detection	Should Support		
26	Region of Interest (RoI)	Should Support		
27	Mirror	Should Support		
28	Image Rotation	Should Support		
29	Privacy Masking	Should Support		

30	Alarm Event	Storage full; network disconnection; IP conflict; motion detection; video tampering; intrusion; tripwire; audio detection.		
31	SDK and API available	Yes		
32	Network Protocol	HTTP; TCP; UDP; RTSP; RTCP; SMTP; FTP; SFTP; DHCP; DNS; DDNS; NTP; Multicast; ICMP; IGMP; PPPoE; SNMP; TLS/ SSL; Telnet/ SSH..		
33	Interoperability	ONVIF (Profile S/Profile G/Profile T)		
34	Storage	Micro SD card (support minimum 256 GB)		
35	Mobile Client	iOS; Android		
36	Operation Temperature / Humidity	-10 ºC to 55 ºC / Less than 95% RH		
37	Weather Proof Standard	IP67		
38	Certifications	FCC, CE, UL, BIS, IK10		
39	Make / Brand: Any globally reputed Manufacturer presence in India & having manufacturing facility in India.			

2 Megapixel 33x CMOS Sensor IR PTZ Network Camera

Sl no.	Feature	Technical Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	Image Sensor	1/2.8" CMOS or Better		
2	Effective Pixels	1920(H) x 1080(V) or Better		
3	Minimum Illumination	Colour: 0.001 Lux @F1.5; B/W: 0 Lux with IR		
4	Focal Length	The Camera should be provided with an OEM fitted 4.6~152 mm of focal length or Better		
5	White Balance	Auto, ATW, Indoor, Outdoor, Manual		
6	Focus Control	Auto / Manual		
7	Electronic Shutter	1/1s~1/30,000s or Better		
8	AGC control	Auto / Manual		
9	Back Light Compensation	WDR: 120dB or Better		
10	Optical Zoom	33x or Higher		
11	Digital Zoom	16x or Higher		
12	Pan Travel	0°~360° endless, Pan Speed: 0.1° ~ 120°/sec		
13	Tilt Travel	- 15° ~ 90° auto flip 180°, Tilt Speed: 0.1° ~120°/sec		

14	Manual Speed	Pan: 0.1° ~160° /s; Tilt: 0.1° ~120° /s		
15	Presents & Pattern	300 Preset, 4 Pattern, 8 Patrols		
16	Present Speed	Pan: 240° /s; Tilt: 180° /s		
17	IR Illumination Distance	200 meter or Better		
18	Privacy Masking	24 Areas or More		
19	Power up Action	Auto restore to previous PTZ and lens status after power failure		
20	Day/Night: IR Cut Filter	Auto (ICR) / Colour / B/W		
21	Video Compression	H.265+/H.265 & H.264+/H.264		
22	Video Streaming	Main stream: PAL: 25 fps (1920 x 1080, 1280 x 720); NTSC: 30 fps (1920 x 1080, 1280 x 720). Sub stream: PAL: 25 fps; NTSC: 30 fps. Third stream: PAL: 25 fps; NTSC: 30 fps.		
23	Audio Compression	G.711a/G.711M/ADPCM/ AAC_LC		
24	Motion Detection	Should Support		
25	ROI	Should Support		
26	Audio Streaming	1/1 channel In/Out		
27	Auto Tracking	Should Support		
28	IVS	Tripwire, Intrusion, bright lights etc.		
29	Networking	RJ-45/ RS485		
30	Protocols	IPv4; IPv6; HTTP; TCP; RTSP; SMTP; FTP/ SFTP; DHCP; DNS; DDNS; NTP; Multicast; IIGMP; PPPoE; SNMP.		
31	Event Trigger	Motion detection, Video tampering , Scene changing, Network disconnection, IP address conflict		
32	Alarm	6/2 channel In/Out		
33	Operating Temperature	-10°C ~ 55°C / Less than 95% RH		
34	Weather Proof Standard	IP66/ IP67		
35	Power Source	AC24V, PoE++ Both Support		
36	Certifications	FCC, CE, UL, BIS, IK10		
39	Make / Brand: Any globally reputed Manufacturer presence in India & having manufacturing facility in India.			

ANPR Camera

Sl no.	Feature	Technical Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	Main Processor	High performance embedded processor to extract and analyse vehicle metadata		
2	Image Sensor	1/2.8'' CMOS or Better		
3	Lens	Built-in 10 mm – 55 mm motorized vari-focal lens or Better		
4	Shutter Mode	Single shutter		
5	Electronic Shutter Speed	1/25 s–1/100000 s (manual/auto) or Better		
6	Exposure Mode	Full auto/ manual/ customized auto/ customized		
7	Iris Control	Fixed iris/manual iris/auto iris/P iris/ DC Drive		
8	Image Resolution	2688 × 1520 or Higher		
9	Video Resolution	4MP (2688 × 1520)/ 2MP (1920 × 1080)/ 720P (1280 × 720)/ 4CIF (704 × 576		
10	Video Frame Rate	Main Stream: 25fps (2688 × 1520, 1920 x 1080); Sub stream: 25 fps (1920 × 1080, 1280 x 720)		
11	Video Compression	H.265+/H.265/H.264M/H.264H/H.264B/MJPEG		
12	Picture Encoding Format	JPEG		
13	WDR	Minimum 140dB		
14	White Balance	Auto/outdoor/manual/local white balance/natural light/street light		
15	Noise Reduction	2DNR/3DNR		
16	HLC	Should Support		
17	Bad Pixel Correction	Should Support		
18	Edge Enhancement	Should Support		
19	Storage	Support SD card (Minimum 128GB)		
20	Image Tampering Prevention	Should Support Watermark and verification are available for videos and pictures		
21	Security	Authorized username and password, MAC address binding, HTTPS encryption, and network access control		
22	License Plate Recognition	Adopts self-developed algorithm to recognize license plates combining numbers and letters		

23	Vehicle Type Recognition	Should Support		
24	Vehicle Color Recognition	Should Support		
25	Motor Vehicle Violation Capture	Should Support		
26	Video Metadata	Should Support Motor vehicle: License plate, vehicle type, vehicle color, license plate color, vehicle logo, and more. Non-motor vehicle: Type (two-wheelers, three-wheelers), color, wearing a helmet or not, passenger (1, 2, 3, or more passengers)		
27	Vehicle recognition rate	≥98%		
28	Network	1 RJ-45 Ethernet port, 10/100/1000M Network transmission		
29	Alarm Input & Output	1 channel In & 1 channel Out		
30	Audio Input & Output	1 channel In & 1 channel Out		
31	Illuminator Number	4 illuminators (850nm IR LED illuminators, brightness adjustable)		
32	Power Supply	12V DC, 24V DC, PoE		
33	Operating Temperature	-10°C to 55°C		
34	Protection Grade	IP67/ IK10 or Better		
35	Certification	FCC, CE, BIS		
38	Make / Brand: Any globally reputed Manufacturer presence in India & having manufacturing facility in India.			

General Surveillance Management Server

Sl. No	Feature	Technical Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	Processor	Intel Xeon-Silver 4216 Processor or AMD EPYC 7282 or Higher		
2	No. of Core	16 Core or Higher		
	Processor speed	2.5 GHz or Higher		
7	Operating System	Microsoft Windows Server 2022 16 Core Standard loaded		
8	Generation	Gen10 or latest		
9	HDD	2 x 480GB SATA / SSD		
10	Power	500W Flex Slot Platinum Hot Plug Low Halogen Power Supply Kit		
11	Storage controller	Smart Array E208i-a SR Gen10 (8 Internal Lanes/No Cache) 12G SAS Modular LH Controller		

12	Memory, standard	64 GB DDR4 3200MHz with 16 DIMMs		
13	Mouse	Optical Mouse		
14	Keyboard	Keyboard		
15	Ethernet	Ethernet 1Gb X 4-port 331T Adapter		
16	Mounting	1x CMA for rail kit		
17	Form Factor	Rack		

Central Video Monitoring Software

Sl. No	Feature	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	Video Management Software with high scalable design and distributed deployment, easily expand the supported channels to 20,000 and central storage capacity to 4 PB. The multi-site function allows to incorporate multiple VMS platforms into one, and conveniently show their information on one PC client. With hot standby and N+1 redundancy.		
2	VMS Shall be based on Microsoft windows OS.		
3	VMS shall be open to IP camera integration in that respects VMS should support IP Cameras from Multiple OEM.		
4	The VMS shall be ONVIF compliant.		
5	VMS shall be open to any NAS (CIFS, SMB 2.0) integration.		
6	VMS shall support H.264 and MJPEG stream for both live view and Recording independently. Compression rate shall be manageable.		
7	The Video Management System shall support cameras with resolutions ranging from Standard Definition, High Definition (HD) and higher resolution		
8	The Video Management System shall show video across 4 displays per workstation - each display can have up to 25 viewing panes.		
9	VMS shall be able to connect with video wall through multi-display client.		
10	Users shall be able to move any image from one display screen to another via drag-and-drop		
11	The VMS shall allow the overlay of time and date information on live video panes		
12	Users shall be able to digitally zoom and also digitally scroll live video from any camera using the mouse wheel		
13	Users shall be able to replay currently viewed live video for replays from 10, 15 or 30 seconds before current time or from alarm time.		
14	The VMS shall allow users to reset the event count for a camera It should be able to display camera information in the On-Screen Display (OSD).		
	a. Camera name		

	b. Date and time			
15	VMS shall be accessible using any desktop client utility for Live view and Archive search			
16	VMS should support the two-way audio so that users shall be able to listen audio from multiple cameras through PC speakers and may speak to one or more cameras through a PC microphone			
17	VMS shall allow managing initial client logon, system configurations, logging, remote administration of recording servers, devices, security, rules, alerts and logging.			
18	VMS shall support at least 3 levels of users with various privileges to access the system functionality. Each category of users shall have selectable rights to perform various operations like Camera add/delete, Change camera settings, Configure storage, Control PTZ cameras, User management, etc			
19	VMS shall maintain a continuous log of server status messages, Camera connectivity, Storage status, Recording ON/OFF, User activity logs , etc which shall be accessed from the Workstations using different filters			
20	Each video streams shall be individually and independently configurable in term of resolution, frames and bandwidth			
21	VMS shall support video streams up to at least 25/30fps			
22	VMS shall support at least CIF, 2CIF, 4CIF/D1 and HD/Megapixel resolution			
23	PTZ Control	All PTZ control shall be user-restricted		
		Users shall be able to zoom a PTZ camera in or out using the PC mouse		
		Users shall be able to pan, tilt and zoom a PTZ camera displayed in a video pane or monitor using a joy stick on one of the supported CCTV keyboards		
		Users shall be able to adjust the iris of a PTZ camera using the on screen PTZ controls or a CCTV keyboard:-Open iris-Close-Auto-iris		
		The Video Management System shall support the following for cameras using the ONVIF interface or Camera Gateway		
		a. Pan, tilt and zoom control with mouse and joystick		
b. Go to pre-set				
c. Set pre-set				
24	The VMS shall have the capability of operating in an environment that requires multi-tasking, when using multiple cameras spread over a wide area			
25	VMS should have Pre and Post Event Recording			
26	VMS should have Motion Detection technology			

27	Software provides remote interface with a full live feed view, with digital zoom options, control of PTZ cameras, multiple simultaneous feeds, and image quality settings to improve performance through bandwidth reduction		
28	Software has built in feature to bring camera observation to mobile devices (require a software on a mobile device to view)		
29	Each camera setting can be adjusted individually according to client's requirement		
30	Schedule operation - All cameras can be fully scheduled individually		
31	View and record multiple cameras		
32	As many playback sessions as are required can be displayed at once		
33	Automatic control of supported PTZ cameras		
34	Alerting by email (with images)		
35	Software should have built in feature to bring camera observation to mobile devices (require a software on a mobile device to view)		
36	The software shall allow:		
A	Live display of cameras.		
B	Live display of camera sequences.		
C	Control of PTZ cameras.		
D	Playback of archived video.		
E	Retrieval of archived video.		
F	Instant Replay of live video.		
G	Configuration of system settings.		
H	Configuration and programming of P/T/Z cameras, features like camera addressing, BLC, auto tours, pre-sets etc.		
I	Video Analytics		
37	The software should be able to do video recording on any of the following options - inbuilt hard disks on the server, direct attached storage boxes attached to servers, network attached storage, storage area network.		
38	The software should be capable of handling camera and alarm icons on area maps. The area map should be configurable to pop up upon the receipt of an alarm received from a camera on the map. This can be on the same or other monitors on the PC.		
39	The software shall be able to select the required recording based on the time recording was activated, the duration of recording, operator activated recording, event activated recording.		
40	It shall be possible to search for recordings in the software by camera, date and time. If a data and time is specified, playback shall commence from that date and time. It shall be possible to playback more than one camera simultaneously.		
41	It Software shall allow operators to bookmark the concern videos & browse through a list of all bookmarks created on the system and select any bookmarked event for viewing. Software shall support industry standard for the interface of IP-based physical security products: ONVIF and shall be based on a server/client model.		

42	VMS should use two independent streams Camera or IP encoders: One for Live View and other for recording. All settings for each stream including resolution, codecs, frame rate and compression level may be choose independently without affection overall system performance and IP device functionality.			
43	Software shall have the capacity to communicate with IP Cameras / Encoders using HTTPS secure protocol. It shall support any form of IP network connectivity, including: LAN/ WAN/ VPN/ Internet.			
44	All audio streams supplied from IP Camera / Encoders shall be digitally encoded in g711 (u-law)/ g721/ g723 or AAC compression formats and recorded simultaneously in real time.			
45	Software shall offer redundant architecture for recording in server. Roles shall move from one server to another without disturbing the regular operations. To minimize network traffic, Software must have ability to configure the key frame interval (I-frame) per second.			
46	All video streams supplied from IP cameras / Encoders shall be digitally encoded in MPEG-4/MPEG-2/MJPEG and H.264 compression formats and recorded simultaneously in real time			
47	Each camera's bit rate, frame rate and resolution shall be set independently and changing these settings will not affectthe recording and display settings of other cameras.			
48	Software shall support dynamically switch the video resolution according to the Tile Size on Monitoring Screen. High Resolution Video feed while watching single cameraon screen and Low Resolution Video feed while watching Cameras in Multiple tiles.			
49	Removed			
50	Removed			
51	Devices	Should Support Minimum 2,000 devices Per Server		
52	Auto-Registered Devices	Should Support Minimum 1,000 devices Per Server		
53	Video Devices and Channels	Should Support Minimum 1,000 devices; 2,000 channels Per Server		
54	Devices Added by ONVIF Protocol	Should Support Minimum 1,000 devices; 2,000 channels		
55	ANPR Channels	Should Support Minimum 500 channels		
56	Total Devices	Should Support Minimum 10,000 locations; 65,000 cameras		
57	Total Incoming Bandwidth	Should Support Minimum 600 Mbps		

58	Incoming Video Bandwidth	Should Support Minimum 600 Mbps		
59	Incoming Picture Bandwidth	Should Support Minimum 200 Mbps		
60	Total Outgoing Bandwidth	Should Support Minimum 600 Mbps		
61	Outgoing Video Bandwidth	Should Support Minimum 600 Mbps		
62	Outgoing Picture Bandwidth	Should Support Minimum 200 Mbps		
63	Total Storage Bandwidth	Should Support Minimum 600 Mbps		
64	Video Storage Bandwidth	Should Support Minimum 600 Mbps		
65	Picture Storage Bandwidth	Should Support Minimum 200 Mbps		
66	Prerecording Bandwidth for Alarm Recordings	Should Support Minimum 400 Mbps		
67	Maximum Capacity of Central Storage (IPSAN)	Should Support Minimum 400 TB, depending upon server capacity		
68	Total Events	Should Support Minimum 100 per second		
69	Storage of Events or Alarms without Pictures	Should Support Minimum 40 per second		
70	Alarms with Snapshots (Stored on Devices)	Should Support Minimum 20 per second		
71	Removed			

Client Workstation PC				
Sl. No	**Feature**	**Technical Specification**	**Specification (Quoted / Applicable – by the bidder)**	**Complied (Yes / No)**
1	Form factor	Tower Type		
2	Operating System	Win 11 SL/ Home 64 bit		
3	Processor & Chipset	Intel i7 12700/ AMD Ryzen 7 5700 or higher; Intel Q670/ AMD Pro 565 or higher		
4	RAM	32 GB DDR4 RAM		
5	Graphics Card	Minimum 4 GB		
6	Storage	512GB NVMe SSD or higher		
7	Power Supply	Min. 400W with 90% or higher efficiency		
8	I/O	Wireless Keyboard and Wireless Mouse, WiFi + BT, Total 10 USB ports, HDMI, DP/ VGA port		
9	Certifications	ISO 9001, 14001, 20001, 27001, EPEAT Gold, ROHS, CE, FCC, UL		
8 Ethernet Port PoE Switch				

Sl. No	Technical Specification		Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	No of Ports	8 10/100/1000 Base-T PoE ports & 2 Gigabit SFP ports		
2	Switching Capacity	20 Gbps or Better		
3	Forwarding Rate	Minimum 14.80 Mbps		
4	POE / POE+	IEEE 802.3af and 802.3at		
5	POE Power Budget	Minimum 130 W or Higher		
6	Power Supply	AC: 100V -240V, 50Hz ±10%		
7	Environment	Operating temperature/ Humidity: 0°C-45°C, 10%-90% non-condensation		
		Storage temperature/ Humidity: 0°C-70°C; 5%-95% non-condensation		
		Power Saving by: Link status, LED or Port Shutoff		
8	MAC Switching	Static configuration and dynamically learning of MAC address		
		Check and delete MAC address		
		Configuring of MAC address aging time		
		Up to 256 Static MAC entries		
		Limit on MAC address learning number		
		MAC address filtering function		
		MAC address size 8K		
9	Port Mirroring	One-to-One, Many-to-One		
		Supports Mirroring for Tx/Rx/Both		
10	V LAN	4K VLAN entries, 256 static VLAN		
		GVRP		
		1:1 and N:1 VLAN Mapping		
		Q-in-Q		
		Private VLAN, Voice VLAN		
11	STP	802.1D (STP), 802.1W (RSTP), 802.1S (MSTP)		
		BPDU protection, root protection and ring protection		
12	Multicast	IGMP v1/v2/v3		
		IGMP Snooping		
		IGMP Fast Leave		
		Multicast group policy and multicast number limit		
13	IPv6	ICMPv6, DHCPv6, ACLv6 and		

		IPv6 Telnet		
		IPv6 Neighbor Discovery		
		MLD v1/v2		
		MLD Snooping		
14	QoS	Traffic classification of each field of L2/L3/L4 protocol headers		
		CAR traffic control		
		802.1P/DSCP priority remark		
		Multiple queuing algorithms such as SP, WRR or SP+WRR		
		WRED		
		Traffic supervision and traffic shaping		
15	Security features	Identification and filtering of L2/L3/L4 based ACL		
		DOS or TCP attacks Prevention		
		Suppression of broadcast, multicast and unknown unicast packet		
		Port isolation		
		Port security, IP+MAC+port binding		
		DHCP Snooping, DHCP Option 82		
		IEEE 802.1x certification		
		Radius and Tacacs+		
16	Reliability	Static / LACP link aggregation		
17	Management and Maintenance	Console, Telnet, SSH 2.0		
		WEB based management		
		SNMP v1/v2/v3		
		TFTP		
		RMON		
18	Certification	CE, FCC, IEC 62368-1		
19	Make / Brand	Any globally reputed Manufacturer presence in India.		
16 Bay Video Storage Device				
Sl. No	**Feature**	**Technical Specification**	**Specification (Quoted / Applicable – by the bidder)**	**Complied (Yes / No)**
1	Main Processor	64-bit high-performance Intel processor or Higher		
2	Memory	Minimum 4GB		
3	Operating System	Embedded LINUX / Windows		
4	Video Stream Mode	640Mbps incoming and recording 320Mbps forwarding,		

		64Mbps playback		
5	IP SAN Mode	Storage bandwidth ≤2.7Gbps Write-through: 320Mbps; Write-back: 480Mbps		
6	Storage	Should Support 16 HDDs, 10TB or higher capacity for each SATA HDD.		
7	miniSAS	1 miniSAS ports, for storage extension		
8	HDD Installation	Additional HDD bracket, HDD hot-swap, HDD online replacement		
9	HDD Mode	Single, RAID 0/1/5/6/10/50/60, hot spare		
10	HDD Manager	Non-working HDD hibernation to guarantee sound ventilation, reduce power consumption and enhance HDD life span HDD bad track mapping to enhance HDD life span		
11	RAID Rebuild	Dynamically adjust RAID rebuild speed to guarantee system load balance		
12	Logic Volume Manager	Support iSCSI volume management, NAS(SMB/NFS/FTP) volume management		
13	Snapshot	Support snapshot function, create user volume toback data.		
14	Extract Frame	Support extracting P frame function. Customized extracting period and frame rate setup		
15	Cluster Service	N+M cluster service		
16	ANR	After disconnection, system can download the record file from the SD card on the network camera to maintain the full record file.		
17	Interface	2 data RJ-45 ports (10/100/1000Mbps)		
18	Network Mode	Multi-address, Fault-tolerance, Load balance, Link aggregation		
19	Network Function	HTTP, HTTPs, TCP/IP, IPv4/IPv6, UPnP, RTP, RTCP, RTSP, UDP, SMTP, NTP, DHCP, DDNS, IP Filter, PPPoE,DDNS, iSCSI, SMB, NFS, FTP.		
20	Interoperability	ONVIF		

21	Power Supply	AC100V ~ 240V,1 + 1 Redundant power		
22	Working Conditions	0°C ~ +40°C		
23	Certification	FCC, CE, UL, BIS, IK10		
24	Make / Brand	Any globally reputed Manufacturer presence in India.		

17U Floor Mount Standing Rack				
Sl. No	Technical Specification		Specification (Quoted / Applicable - by the bidder)	Complied (Yes/No)
1	19", 17U x 600mm width x 800mm depth Floor Standing Networking Rack			
2	It should confirm to DIN 41494 or equivalent ISO standard			
3	It should be welded construction with steel frame			
4	Single Lockable tough end glass front door			
5	Vented metal door at the back, Vented side panels			
6	Powdered coated standard finish			
7	4 sets of casters wheel			
8	4 sets of adjustable levelers			
10	Horizontal Cable Manager			
11	OEM should have valid ISO 9001, ISO 14001 & ISO 45001:2018 certified for design and development of LAN and WAN products, all the relevant certificates must be submitted along with the bid.			
12	Mounting Hardware set			
13	At least 2nos. Of FANs (180CFM) for cooling purpose			
14	Make / Brand	Any globally reputed Manufacturer presence in India.		

All SFP Core Switch

Sl. No	Technical Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	Layer-3 Fully Managed Switch having 24x 1G SFP slots with 4x combo 10/100/1000BaseT ports & 4x 10G SFP+ slots.		
2	SFP slots should support IEEE 802.3z & IEEE 802.3u compliant transceivers & SFP+ slots should support IEEE 802.3z & IEEE 802.3ae compliant transceivers		
3	The switch should be 19" Rack Mount size.		

	THE SWITCH SHOULD HAVE FOLLOWING BASIC FEATURE FROM DAY ONE:		
4	The switch should have RJ45/mini-USB console port for Out of band CLI management & ethernet port for out of band IP management. It should have minimum one alarm port.		
5	The switch should have intelligent fans with sensor that provides different fan speed based on different temperature.		
6	The switch should have support for redundant power supply.		
7	The switch should have built-in hardware feature for both external event detection & alarm action		
8	The switch should have switching capacity at least 128Gbps & packet forwarding rate at least 95Mpps for 64-bytes packet size		
9	The switch should have non-blocking architecture & wire-speed performance under fully loaded condition.		
10	The switch should have virtual stacking capability of at least 25 switches in a stack.		
11	The switch should have physical stacking capability with at least 8 units per stack & at least 40Gbps of stacking bandwidth.		
12	The switch should have feature for flexible management of switch resources		
13	The switch should have 6kV Surge protection on all RJ45 access ports		
	THE SWITCH SHOULD HAVE FOLLOWING LAYER-2 FEATURE FROM DAY ONE:		
14	a) At least 64K MAC address table size. At least 1K static MAC support.		
15	b) Jumbo frame support for at least 12KB frame size.		
16	c) Flow-control features: 802.3x for full duplex & Head-of-		

	line blocking prevention.		
17	d) UDLD or equivalent features.		
18	e) IEEE 802.1D (STP), 802.1w (RSTP) & 802.1s (MSTP) with at least 64 MSTP instances, Root Guard or equivalent features.		
19	f) Avoidance of the loop occurring in a single port connected to an unmanaged switch/hub by shutting down the corresponding port or corresponding VLAN		
20	g) Ethernet Ring Protection Switching (ERPS) with maximum 50milli second recovery time.		
21	h) IEEE 802.1AX & 802.3ad Link aggregation with at least 32 groups per device & at least 8 ports per groups. LACP.		
22	i) Port mirroring with at least 4 mirroring sessions. Should support Tx, Rx & both based mirroring. Should support one-to-one & many-to-one mirroring, flow-based mirroring, RSPAN.		
23	j) IGMP v1 v2 & v3 snooping with at least 8000 snooping groups. Should support IGMP snooping per VLAN, host-based IGMP snooping fast leave, at least 128 static IGMP groups, L2 multicast filtering		
24	k) MLD v1 & v2 snooping with at least 4000 snooping groups. Per VLAN MLD snooping. At least 128 static MLD groups.		
25	l) At least 4K VLAN groups, 802.1Q, 802.1v protocol based VLAN, Q-in-Q, GVRP with at least 4K dynamic VLANs, Voice VLAN, Port-based VLAN, MAC-based VLAN, private VLAN, VLAN trunking, MVR (Multicast VLAN Registration) or equivalent feature.		
	THE SWITCH SHOULD HAVE FOLLOWING LAYER-3 FEATURE FROM DAY ONE:		
26	a) At least 16K routing table entry size with at least 512 static route entry support.		
27	b) Default route, RIPv1, RIPv2, RIPng, OSPFv2, OSPFv3, BGPv4, BGPv4+, Policy based route, Route preference, Route Redistribution, Bidirectional Forwarding Detection, MSDP		
28	c) Multicast forwarding table size: at least 2000, IGMPv1v2v3, MLDv1v2, IGMP filtering, static IP multicast route, PIM-DM, PIM-SM, PIM-SSM, PIM-Sparse-Dense mode, DVMRPv3, PIM-SMv6.		
29	e) IPv6 tunnelling, VRRP, IP helper		
	THE SWITCH SHOULD HAVE FOLLOWING QOS FEATURE FROM DAY ONE:		
30	a) IEEE 802.1p, DSCP, at least 8 queues per port.		
31	b) Queue handling methods: strict, weighted round robin, weighted deficit round robin, WRED		
32	c) CoS & classification of packets based on following parameters: VLAN ID, 802.1p priority, MAC address, Ether type, DSCP, protocol type, IPv4 address, TCP/UDP port number, IPv6 address, IPv6 traffic class		
33	d) Port & flow based bandwidth control with minimum granularity 8Kbps.		
34	e) Time based QoS.		
	THE SWITCH SHOULD HAVE FOLLOWING SECURITY		

	FEATURE FROM DAY ONE:		
35	a) Access control list based on VLAN, MAC address, 802.1p priority, DSCP, protocol type, TCP/UDP port, IPv4 address, IPv6 address, IPv6 traffic class		
36	b) Time based ACL.		
37	c) Binding of IP address & MAC address with the interface. Dynamic ARP Inspection. IP Source Guard. DHCPv6 Guard, IPv6 Route Advertisement Guard, IPv6 Neighbour Discovery Inspection, Duplicate Address Detection		
38	d) SSHv2 for both IPv4 & IPv6, SSL (TLS 1.2) for both IPv4 & IPv6, Port security with at least 12K MACs per port.		
39	e) Broadcast, multicast & unicast storm control.		
40	f) Protection of the CPU from protocol control packet attack.		
41	g) DHCP server screening, DHCP client filtering, ARP spoofing prevention, BPDU attack prevention, DoS attack prevention		
42	h) IEEE 802.1x -- RFC 3580, web-based access control, MAC based access control, guest VLAN, Microsoft NAP, RADIUS accounting.		
43	i) Authentication supported based on : Local data base, RADIUS server		
44	j) Web based access control for IPv6		
45	k) At least 4 level user account for management access. RADIUS & TACACS+ authentication for management access.		
	THE SWITCH SHOULD HAVE FOLLOWING MANAGEMENT FEATURE FROM DAY ONE:		
46	a) Web based -GUI (IPv4 & IPv6), CLI, telnet server & client (IPv4 & IPv6) , TFTP client (IPv4 & IPv6), FTP client (IPv4 & IPv6), SFTP server, Zmodem, SNMPv1v2cv3, Syslog. sFlow, ICMPv6.		
47	b) RMONv1 & v2, LLDP, LLDP-MED, BooTP & DHCP client supporting both IPv4 & IPv6, DHCP relay option 82, DHCP relay option 60 & 61.		
48	c) Multiple images & configurations, SNTP, debug		
49	d) 802.3ah ethernet link OAM, 802.1ag CFM, Dying gasp.		
50	e) Inbuilt power saving technique on all Gigabit RJ-45 ports, IEEE 802.3az		
51	Secure Product Development Lifecycle Process Requirement Certification in accordance with IEC 62443-4-1: 2018 standard for cyber security capability		
52	All type of switches & transceivers should be from same make.		
53	All Core switches should be from same make.		

Copper Core Switch

Sl. No	Technical Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	Core Switch - Layer-3 Fully Managed Switch having 20 X 1Gbps Copper Ports with 4x combo 1G SFP slots & 4x 10G SFP+ slots		
2	SFP slots should support IEEE 802.3z & IEEE 802.3u compliant transceivers & SFP+ slots should support IEEE 802.3z & IEEE 802.3ae compliant transceivers		
3	The switch should be 19" Rack Mount size.		
	THE SWITCH SHOULD HAVE FOLLOWING BASIC FEATURE FROM DAY ONE:		
4	The switch should have RJ45/mini-USB console port for Out of band CLI management & ethernet port for out of band IP management. It should have minimum one alarm port.		
5	The switch should have intelligent fans with sensor that provides different fan speed based on different temperature.		
6	The switch should have support for redundant power supply.		
7	The switch should have built-in hardware feature for both external event detection & alarm action		
8	The switch should have switching capacity at least 128Gbps & packet forwarding rate at least 95Mpps for 64-bytes packet size		
9	The switch should have non-blocking architecture & wire-speed performance under fully loaded condition.		
10	The switch should have virtual stacking capability of at least 25 switches in a stack.		
11	The switch should have physical stacking capability with at least 8 units per stack & at least 40Gbps of stacking bandwidth.		
12	The switch should have feature for flexible management of switch resources		
13	The switch should have 6kV Surge protection on all RJ45 access ports		
	THE SWITCH SHOULD HAVE FOLLOWING LAYER-2 FEATURE FROM DAY ONE:		
14	a) At least 64K MAC address table size. At least 1K static MAC support.		
15	b) Jumbo frame support for at least 12KB frame size.		
16	c) Flow-control features: 802.3x for full duplex & Head-of-line blocking prevention.		
17	d) UDLD or equivalent features.		
18	e) IEEE 802.1D (STP), 802.1w (RSTP) & 802.1s (MSTP) with at least 64 MSTP instances, Root Guard or equivalent features.		
19	f) Avoidance of the loop occurring in a single port		

	connected to an unmanaged switch/hub by shutting down the corresponding port or corresponding VLAN		
20	g) Ethernet Ring Protection Switching (ERPS) with maximum 50milli second recovery time.		
21	h) IEEE 802.1AX & 802.3ad Link aggregation with at least 32 groups per device & at least 8 ports per groups. LACP.		
22	i) Port mirroring with at least 4 mirroring sessions. Should support Tx, Rx & both based mirroring. Should support one-to-one & many-to-one mirroring, flow-based mirroring, RSPAN.		
23	j) IGMP v1 v2 & v3 snooping with at least 8000 snooping groups. Should support IGMP snooping per VLAN, host-based IGMP snooping fast leave, at least 128 static IGMP groups, L2 multicast filtering		
24	k) MLD v1 & v2 snooping with at least 4000 snooping groups. Per VLAN MLD snooping. At least 128 static MLD groups.		
25	l) At least 4K VLAN groups, 802.1Q, 802.1v protocol based VLAN, Q-in-Q, GVRP with at least 4K dynamic VLANs, Voice VLAN, Port-based VLAN, MAC-based VLAN, private VLAN, VLAN trunking, MVR (Multicast VLAN Registration) or equivalent feature.		
	THE SWITCH SHOULD HAVE FOLLOWING LAYER-3 FEATURE FROM DAY ONE:		
26	a) At least 16K routing table entry size with at least 512 static route entry support.		
27	b) Default route, RIPv1, RIPv2, RIPng, OSPFv2, OSPFv3, BGPv4, BGPv4+, Policy based route, Route preference, Route Redistribution, Bidirectional Forwarding Detection, MSDP.		
28	c) Multicast forwarding table size: at least 2000, IGMPv1v2v3, MLDv1v2, IGMP filtering, static IP multicast route, PIM-DM, PIM-SM, PIM-SSM, PIM-Sparse-Dense mode, DVMRPv3, PIM-SMv6.		
29	e) IPv6 tunnelling, VRRP, IP helper		
	THE SWITCH SHOULD HAVE FOLLOWING QOS FEATURE FROM DAY ONE:		
30	a) IEEE 802.1p, DSCP, at least 8 queues per port.		
31	b) Queue handling methods: strict, weighted round robin, weighted deficit round robin, WRED		
32	c) CoS & classification of packets based on following parameters: VLAN ID, 802.1p priority, MAC address, Ether type, DSCP, protocol type, IPv4 address, TCP/UDP port number, IPv6 address, IPv6 traffic class		
33	d) Port & flow based bandwidth control with minimum granularity 8Kbps.		
34	e) Time based QoS.		
	THE SWITCH SHOULD HAVE FOLLOWING SECURITY FEATURE FROM DAY ONE:		
35	a) Access control list based on VLAN, MAC address, 802.1p priority, DSCP, protocol type, TCP/UDP port, IPv4 address, IPv6 address, IPv6 traffic class		
36	b) Time based ACL.		

37	c) Binding of IP address & MAC address with the interface. Dynamic ARP Inspection. IP Source Guard. DHCPv6 Guard, IPv6 Route Advertisement Guard, IPv6 Neighbor Discovery Inspection, Duplicate Address Detection		
38	d) SSHv2 for both IPv4 & IPv6, SSL (TLS 1.2) for both IPv4 & IPv6, Port security with at least 12K MACs per port.		
39	e) Broadcast, multicast & unicast storm control.		
40	f) Protection of the CPU from protocol control packet attack.		
41	g) DHCP server screening, DHCP client filtering, ARP spoofing prevention, BPDU attack prevention, DoS attack prevention		
42	h) IEEE 802.1x -- RFC 3580, web-based access control, MAC based access control, guest VLAN, Microsoft NAP, RADIUS accounting.		
43	i) Authentication supported based on : Local data base, RADIUS server		
44	j) Web based access control for IPv6		
45	k) At least 4 level user account for management access. RADIUS & TACACS+ authentication for management access.		
	THE SWITCH SHOULD HAVE FOLLOWING MANAGEMENT FEATURE FROM DAY ONE:		
46	a) Web based -GUI (IPv4 & IPv6), CLI, telnet server & client (IPv4 & IPv6) , TFTP client (IPv4 & IPv6), FTP client (IPv4 & IPv6), SFTP server, Zmodem, SNMPv1v2cv3, Syslog. sFlow, ICMPv6.		
47	b) RMONv1 & v2, LLDP, LLDP-MED, BooTP & DHCP client supporting both IPv4 & IPv6, DHCP relay option 82, DHCP relay option 60 & 61.		
48	c) Multiple images & configurations, SNTP, debug		
49	d) 802.3ah ethernet link OAM, 802.1ag CFM, Dying gasp.		
50	e) Inbuilt power saving technique on all Gigabit RJ-45 ports, IEEE 802.3az		
51	Secure Product Development Lifecycle Process Requirement Certification in accordance with IEC 62443-4-1: 2018 standard for cyber security capability		
52	All type of switches & transceivers should be from same make.		
53	All Core switches should be from same make.		

600 VA Offline UPS

Feature		**Technical Specification**	**Specification (Quoted / Applicable – by the bidder)**	**Complied (Yes / No)**
INPUT	Voltage	220/230 VAC		
	Voltage Range	140-300 VAC		
	Frequency Range	50 Hz		
OUTPUT	AC Voltage Regulation (Battery Mode)	±10%		

	Frequency Range (Battery Mode)	50 Hz ±1 Hz		
	Transfer Time	Typical 2-6 ms		
	Waveform (Battery Mode)	Simulated Sine Wave		
	Overload	110% +/-10% Shutdown after 5 minutes		
BATTERY	Battery Type & Number	12 V/7 Ah x 1		
	Typical Recharge Time	6-8 hours up to 90% capacity		
TRANSFER TIME	Minimum line break for transfer to battery	Typical 4-8 msec		
INDICATORS	AC Mode	Green lighting		
	Battery Mode	Green flashing		
	Fault	Red lighting		
ALARMS	Battery Mode, Low Battery, Overload, Battery replacement, fault	Audible alarm		
PROTECTION	Full Protection	Overload, discharge, and overcharge protection		
ENVIRONMENT	Operating Environment	0-40 Deg C.		
	Storage Temp	-15℃ to 50℃		
	Humidity	0-95 % RH @ 0-40°C (non-condensing)		
	Noise Level	Less than 40dB		
Test reports	BIS registration	Require		
	NABL Approved government lab test report.	Require		

Make / Brand : Any globally reputed Manufacturer presence in India

3 KVA Online UPS `

Sl. No.	Feature	Technical Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	Capacity	3kVA/2.4 kW.		
2	Design	True online double		

		conversion design		
Input Characteristics.				
3	Nominal Input Voltage	230Vrms		
4	Nominal Input Frequency	50Hz.		
5	Input Power Factor	0.99		
6	Type of Rectifier	IGBT Based PWM Rectifier		
7	Input Voltage Range	110 VAC to 300 VAC		
8	Voltage Detection Tolerance ±3% Calibration	±3% Calibration		
9	Input Frequency Range	40-70Hz		
10	Inrush Limitation	7*IRMS_Nom		
11	Current Protection	With Fuse.		
Battery Parameters.				
12	Charging Method	Constant voltage constant current (CVCC)		
13	Charging current Capacity	Settable 1/2/4/6		
14	Type of Batteries	SMF VRLA, Li-ion, Tubular		
15	Back up time	2 Hours		
16	Minimum VAH required	4680		
17	Maximum Battery Leakage Current	500uA		
18	Charge Voltage Accuracy	±1%		
Output Parameters.				
19	Load power factor	0.8		
20	Nominal Output voltage	208/ 220/ 230/ 240 VAC Settable		
21	Output Frequency	Frequency Range (Battery Mode): 50 Hz ± 0.1 Hz; Frequency Range (Synchronized Range): 46Hz ~ 54 Hz @ 50Hz system		
22	Output Waveform	Pure sine wave		
23	Total Harmonic distortion (THD)	Less than 3% for Linear Load and Less than 6% for RCD Load		
24	Inverter	IGBT based PWM with Instantaneous Sine wave control		
25	Power Rating	3kVA/2.4 kW.		
26	Dynamic response	IEC62040-3 Classification 1		
27	Crest factor	3:1		
28	Duty.	Continuous duty		

29	Overload Capacity	AC mode:105%~110%: 10min、110%~130%: 1min、>130% : 1sec ;		
30	Frequency synchronization Band for Static. Bypass	46 - 54Hz		
31	Transfer (Inverter to Bypass)	0 ms		
32	Retransfer (Bypass to Inverter)	0 ms		
33	Automatic Bypass	Inbuilt		
34	Overall efficiency (AC to AC)	90%.		
Miscellaneous Function				
35	Intelligent Fans Speed Control	Require		
36	Auto Restart Function	Require		
Physical and Environmental Characteristics.				
37	Acoustic Noise Level	Less than 58dB @ 1 Meter		
38	Ambient Temperature	0 - 50 Deg C		
39	Storage Temperature	-15°C~60°C		
40	Humidity	<95 % and non-condensing		
41	Altitude	<1000m		
42	Enclosure Protection Grade	IP 20		
43	Cooling	Forced Air		
Metering (Digital display)				
44	Input voltage	Advanced LCD based Display System, able to monitor Input Voltage/Battery Voltage/ Output Voltage / Output Frequency/ Input Frequency/ Ambient Temperature.		
45	Battery voltage			
46	Output voltage			
47	Output current			
48	Output frequency			
49	Input Frequency			
50	Heat sink temperature			
Fault indicated on Digital Display Alarms		LED indication display		
51	input fail	Inbuilt and accessible on LCD Display.		
52	Battery Low			
53	Transfer to bypass and system fault			
54	LED Indications			
55	Protection	Overload/ Short Circuit/ Battery Deep Discharge/ Low Battery/ Reverse Battery/ Inverter Current Limitation/ Over		

		Temperature/ Output Overvoltage.		
56	Optional features	RS 232 communication port for interfacing, Remote monitoring		
Standards				
57	Low freq Conducted disturbance	IEC61000-2-2		
Other Standards				
58	Continuous Electromagnetic Susceptibility	IEC 61000-4-3		
59	Electrical Fast Transient Compatibility	IEC 61000-4-4		
60	Surge	EN 61000-4-5: 2005		
61	CRFI	IEC61000-4-6		
62	Magnetic Field Immunity	IEC 61000-4-8		
63	Transportation	IEC 60068-2-32,IEC 60068-2-64,IEC 60068.2-27		
64	Protection	IP-20		
65	NABL approved Government lab test certificate	Require		
66	ISO certifications	ISO 9001, ISO14001, ISO27001, ISO 45001:2018		
67	BIS registration	Require		
68	Make / Brand : Any globally reputed Manufacturer presence in India			

6 KVA Online UPS

Feature		**Technical Specification**	**Specification (Quoted / Applicable – by the bidder)**	**Complied (Yes / No)**
	Rating	6KVA/ 6kw 1In-1out		
System parameter	Technology	IGBT based Double conversion PWM based online UPS		
	Parallel mode	4 (N+1)		
	Installation mode	Rack/ Tower		
Input	Rated voltage	230vac 1-Phase ,3 wire		
	Voltage Range	176VAC -287VAC at full load, 100VAC to 287VAC		

		at half load		
	Rated Frequency	50Hz/ 60Hz		
	Frequency Range	40Hz ~ 70Hz		
	Power factor	0.99		
OUTPUT	Rated power	6KVA/ 6kw		
	Voltage	Single phase, 230VAC		
	Frequency synchronization range	Rated frequency±3Hz. Configurable range: ±0.5Hz ~ ±5Hz		
	Rated Power Factor	Unity		
	Crest Factor	3:1'		
	Voltage harmonic distortion	< 2% (linear load)		
	Voltage Regulation	1%		
	Dynamic response recovery time	60ms		
	Inverter Overload Capability on utility mode	At 25°C: 105% ~ 125%-5min; 125% ~ 150%-1min; 150%- more than 200ms		
	Programmable Outlet	Require		
	Inverter Overload Capability on battery mode	At 25°C :105% ~125%-60~ 30 s; >125%- more than 200ms		
Bypass	Static bypass	Inbuilt		
Efficiency	ECO Mode	96%		
	Online mode (AC-AC)	> 95%		
	Inverter Efficiency(DC-AC)	>92%		
BATTERY backup 5 kw (unity)	Type	Sealed, lead-acid, Tubular, LI-ION		
	back up 120 min	minimum 12480 VAH		
	Battery charging capacity	5A		
Transfer Time	Mains - Battery	0ms		
	Inverter-Bypass	Synchronous transfer: ≤0ms		
		Asynchronous transfer (default): ≤20ms		
Noise		<65db		
Panel display mode	Display type	Gravity sensor display		
	No of events stored	Max 256		
	Orientation	Gravity sense		
Environmental parameter	Operating temperature	0°C ~ 50°C		
	Storage temperature	-40°C ~ +70°C (battery excluded); -25°C ~ +55°C (battery included)		
	Relative humidity	5%RH ~ 95%RH, non-condensing		
	Altitude	≤3000m; derating when higher than 3000m		

Mechanical parameter	W*D*H (mm)	430 X 450 X 85		
	Weight (Kg)	11		
	Ventilation	Forced -air cooled		
	Ingress protection level	IP20		
	Color	Powder coated Black Texture finish		
	Cable entry	Rear		
Network Management	Smart RS232/USB	Supports Windows, Linux, Unix and MAC		
	SNMP	Inbuilt for web monitoring		
	MODBUS	Inbuilt for BMS connectivity		
	Remote alarm	Inbuilt		
	Optional SNMP	Power management from SNMP manager and web browser		
	Management software	Site monitor		
	Modbus	Inbuilt via multifunction port		
Certifications	Safety (CE)	IEC/EN62040-1-1		
	Electromagnetic Compatibility(EMC)	IEC/EN62040-2, IEC/EN61000-3-11, IEC/EN61000-3-12, YD/T1095-2008		
	Surge Protection	IEC/EN62040-2, meeting IEC/EN61000-4-5		
	Energy star	Approved		
	ROHS	Require		
	ISO Certifications	ISO 9001, ISO 14001, ISO 45001, ISO 27001		
	NABL Approved Government lab test report	Require		

Make / Brand : Any globally reputed Manufacturer presence in India

UTM Firewall Hardware Device

Hardware Platform:	**Specification (Quoted / Applicable – by the bidder)**	**Complied (Yes / No)**
• No built-in mechanical moving parts.		
• Should be Hardened OS based firewall		
• Should have flash based configuration storage with NO built in HDD		
The firewall should 5 x 1GbE RJ45 connectors, 1000 Base-TX (10/100/1000Mbps). 2 USB 3.0, 1 RJ45 RS232 console port. Wireless Radio Type and Frequency Band, 2x2 802.11ax Wi-Fi 6 dual band radios, 2.4 GHz: Data rates up to 573 Mbps, 5 GHz: Date rates up to 1.2 Gbps		

Memory/Flash : RAM: DDR4 4GB, eMMC 4GB Storage Power supply - Input Ratings: 100-240V AC, 0.9A Max, 50-60Hz. Output Ratings: 12V DC, 2.5A, Power Consumption - 25 Watts		
Following IP Address Assignment should be supported by the device:		
• Static		
• PPPoE Client		
• DHCP Client		
Firewall should support internal DHCP Server		
Firewall should be able to act as DHCP Relay Agent		
Performance:		
The firewall should support minimum 3.14 Gbps Gbps Firewall throughput		
The firewall should support minimum 403 Mbps UTM(fullscan) throughput		
The firewall should support minimum 1.02 Gbps VPN (UDP 1518) throughput		
The firewall should support minimum 472 Mbps GAV throughput		
The firewall should support minimum 525 Mbps IPS (fullscan) throughput		
The firewall should support minimum 1,300,000 concurrent sessions(Bidirectional)		
New session per second should me minimum 16,000		
Authentication servers/processes:		
Support for user authentication services such as Active Directory, LDAP, RADIUS, Secure ID, Digital certificates, Local user group authentications.		
Should Support Single-Sign-On Feature		
Should be able to support Terminal Services client / Citrix Client		
Networking:		
Firewall should support port independence		
Firewall should support Link Failover (Active - Active and Active - Passive)		
Firewall should be able to operate in Routing mode or Bridge (Transparent) mode		
Should support automatic WAN failover as well as load sharing for outbound traffic.		
Should be able to support VPN Failover		
Should support Server Load Balancing		
Firewall must support VLAN Tagging (IEEE 802.1Q)		
Should support Policy-Based Routing		
Firewall should support Dynamic Routing (RIP v1 & v2, OSPF & BGP)		
The Firewall must provide NAT functionality, including dynamic and static NAT translations.		
Firewall should be able to support Port Forwarding.		
Should have option to configure traffic shaping / QOS		

Compatible to Centralized Management		
The firewall must support Active-Active as well as Active-Passive redundancy.		
Actibve/Active as well as Active/Passive HA Clustering can be achieved		
The cluster should support simple and minimal downtime during upgrade		
Should have option to create ALIASES to identify group of Hosts or networks with one Unique Name		
Should have option to create Customized Aliases based on User/Group , Host IP/IP Range & Interface		
VPN function:		
The VPN should be integrated with firewall and support the full Encryption & other standards and protocols:		
(a) DES, 3DES, AES		
(b) MD5 and SHA-1 authentication		
(c) Diffie-Hellman Group 1, Group 2, Group 5 ,Group14, Group 15, Group 19 and Group 20		
(d) Internet Key Exchange (IKE) algorithm		
(f) The new encryption standard AES 128, 192 & 25 (Advanced Encryption Standard)		
Should support IPSec, PPTP, L2TP & SSL VPN		
Should support 75 Site-to-Site Tunnels (BOVPN)		
Should support minimum 75 Mobile VPN tunnels (IPSec, SSL, L2TP)		
Security:		
Should support Reputation based Cloud Security feature		
Denial of Service (DoS) attacks such as ping of death, syn flood, UDP bomb, Land attack, Smurf, Fraggle and ICMP unreachable		
Should support Auto Blocking of Source IP address based on triggers		
should support real time spam detection & also supports proactive virus detection technology which detects and blocks the new outbreaks immediately and accurately.		
The following actions should be supported for SMTP traffic		
• Tagging		
• Drop		
• Deny		
• Quarantine		
Should support of blocking attachments based of file names or extension		
Should support of blacklisting / whitelisting		
Should support Language independent anti-spam solution		
Advance Recurring Pattern Detection - anti-spam technology, that rely on RBL and scoring.		
Support for quarantine feature		
Web URL filtering with 100+ category based database, with option to refer Online or can be stored on Local Management		

Station		
Should be able to define specific URL's to be Allowed/Blocked		
Users should be able to allow blocked website using password override feature		
IPS and AV signature database keep on updating with hourly basis		
Should have a built-in Signature IPS engine on the same unit for IPS		
Should have Server/Client Quota based Distributed Denial of Service Prevention		
Should have the feature to exclude certain hosts' traffic (IP addresses) to be scanned by IPS for particular signatures		
Gateway AV should be supported for real-time detection of viruses and malicious code for HTTP, HTTPS, FTP, SMTP, POP3, SIP.		
Should have configurable policy options to select what traffic to scan for viruses		
Should support Application control for Web 2.0 applications		
Should not have inhouse security services for AV, IPS, Antispam		
Administration:		
Dedicated Application based GUI management program for robust configuration and management.		
Option for Remote management, through WEBUI, CLI & Secure Management Software		
Administrative TCP/IP ports should be other than TCP 80 and TCP 443 to prevent brute-force attack.		
Should support only single administrative login for integrity purpose and deny consecutive administrative login attempts		
Support for role based administration of firewall		
Configurable connection timeout for the management interface.		
Real-time network connection map for connection status.		
Drag-and-drop VPN configuration capability.		
Comprehensive reporting suite without any additional cost.		
Offline policy files configuration and modification.		
The Firewall must send SNMP traps to Network Management Servers (NMS) in response to System failures.		
Ability to make a full backup of the entire flash disk as image file.		
Ability to make/edit configuration file offline for better administrative management, without connecting to the operating security device.		
Should have option to Change Default Web UI Port		
Should have option to schedule rebooting		
Monitoring, Logging and Reporting		
Live Traffic Monitor		
Real-time reporting with Drill Down Feature		
System Services Status Monitor		
Authenticated User List Monitor		

VPN Connections Monitoring		
IP/Host/User based Traffic Watch with option Block Source/Destination from the monitoring tool itself		
Protocol based Traffic Watch		
PDF Audit Reporting		
Remote Logging Support		
Remote Reporting Support		
Remote Monitoring Support		
Encrypted Log Channel		
Provision to generate automatic alerts via mails / syslog		
The Firewall must send SNMP traps to Network Management Servers (NMS) in response to System failures.		
Multi-Appliance Log Aggregation		
Logging and reporting solution should be provided at no extra cost and shouldn't need any license renewal		
1 day of data (reports) retention should be provided at no extra cost on cloud		
Make / Brand : Any globally reputed Manufacturer presence in India		

49" DISPLAY

Sl. No	Section	Feature	Technical Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	Panel	Screen Size	49" or higher		
2		Panel Technology	IPS or VA		
3		Aspect Ratio	16:09		
4		Native Resolution	3,840 x 2,160 (UHD)		
5		Backlight Unit Type	Edge		
6		Brightness (cd/m2)	500nit or higher		
7		Dynamic Contrast Ratio	1,000,000:1 or higher		
8		Viewing Angle (H x V)	178 x 178 or higher		
9		Response Time	8ms(G to G) or better		
10		Surface Treatment (Haze)	Haze 28% or higher		
11		Operation Hours	24x7 Hrs		
12		Orientation	Landscape & Portrait		
13	Connectivity	Input	HDMI (3), DP, DVI-D, Audio, USB (2)		
14		Output	HDMI/DP, Audio		
15		External Control	RS232C In/out, RJ45 (LAN) In, IR In		
16	Specificatio	VESA	200 x 200 or as per		

	n		OEM		
17	Key Feature	CPU-ARM Cortex-A53 1.1 GHz Quad, RAM-2GB DDR3-2133 (64bit), Memory-16GB, GPU-ARM Mali-T820 MP2 (650MHz), Built-in Wi-Fi, Temperature Sensor, Auto Brightness sensor, Acceleration(Gyro) Sensor, Local Key Operation, Embedded CMS, USB Plug & Play, Fail over, Background Image, Sync Mode, Multi-screen (PIP, PBP (4)), Screen Share, Play via URL, Rotation (Screen Rotation, External Input Rotation), Gapless Playback, Tile Mode Setting (Max. 15 × 15), Setting Data Cloning, SNMP, Control Manager, 3rd Party Compatibility (Creston Connected), Power (Smart Energy Saving, PM mode, Wake on LAN, Beacon, HDMI-CEC			
18	Environmental	Operation Temperature	0°C to 40°C		
19	Conditions	Operation Humidity	10% to 80%		
20	Power	Power Supply	100-240V~, 50/60Hz		
21		Power Type	Built-In Power		
22		Consumption: Smart Energy Saving / Max.	100W / 140W		
23	Software	Content Management Software	SuperSign CMS		
24	Compatibility	Control and Monitoring Software	SuperSign Control / Control+		
25	Certification	Safety	CB		
26		EMC	FCC Class "A" / CE / KC		
27		ErP / Energy Star	Yes / Yes		
28	Special Feature	Tilt (Facedown)	Max. 15°		
29		IP Rating	IP5x		

42U Floor Mount Standing Rack

Sl. No	Technical Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	19", 42U x 800mm width x 1000mm depth Floor Standing Networking Rack		
2	It should confirm to DIN 41494 or equivalent ISO standard		

3	It should be welded construction with steel frame		
4	Single Lockable tough end glass front door		
5	Vented dual metal door at the back, Vented side panels		
6	Powdered coated standard finish		
7	4 sets of casters wheel		
8	4 sets of adjustable levellers		
9	Horizontal Power Distribution Unit with 12 x 5/15A sockets Round Pin, 230 Volts AC, 32 Amp with Plug		
10	Horizontal Cable Manager		
11	Mounting Hardware set		
12	At least 4nos. Of FANs (360CFM) for cooling purpose		
13	Make / Brand : Any globally reputed Manufacturer presence in India		

27U Floor Mount Standing Rack

Sl. No	Technical Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	19", 27U x 800mm width x 800mm depth Floor Standing Networking Rack		
2	It should confirm to DIN 41494 or equivalent ISO standard		
3	It should be welded construction with steel frame		
4	Single Lockable tough end glass front door		
5	Vented dual metal door at the back, Vented side panels		
6	Powdered coated standard finish		
7	4 sets of casters wheel		
8	4 sets of adjustable levellers		
10	Horizontal Cable Manager		
11	Mounting Hardware set		
12	At least 2nos. Of FANs (180CFM) for cooling purpose		
13	Make / Brand : Any globally reputed Manufacturer presence in India		

24 Port LIU

Sl. No	Technical Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	24 Port Rack Mount LIU Fully Loaded with Single Mode LC Adapters and Pigtail (1 mtr)		
2	Aluminum & Cold Steel based material with powder coating for light mounting.		
3	Snap-in locker design, easy to change the adapter panels		
4	Should manage both splices and terminations		
5	Should have plastic Splice Tray capable of 24 fibers		
6	Should have 6 fiber magic sticker provision inside for 900um tight buffered fiber storing		
7	Accessory kit consists of cable ties, mounting ear screw		

8	Front-Mounted Cable Saddles for jumper management		
9	Removable Top & Front cover for better access to interior of LIU		
10	Rubber grommet allow for pre-terminated fiber trunk installation, protects cable and minimizes dust build-up		
11	Adapter panel - Cold steel		
12	Adapters should have compact design & high precision		
13	which perform well under various circumstances & maintain good plug retention strength.		
14	All fiber items should be from same make.		
15	Make / Brand : Any globally reputed Manufacturer presence in India		

1Gbps FO Transceiver

Sl. No	Technical Specification		
1	1 Gbps Single Mode Fibre Optic Transceiver (For Core Switch)		
2	1000BASE-LX Single Mode SFP Transceiver with Duplex LC Connector		
3	Support IEEE 802.3z standard		
4	At least 10Km distance support on single mode fiber interface		
5	Transceiver module should be hot pluggable. MSA Compliant		
6	TTL signal detect indicator, Metal enclosure for lower EMI		
7	Operating wavelength: 1310nm		
8	It should be of same make as Core Switches		
9	Secure Product Development Lifecycle Process Requirement Certification in accordance with IEC 62443-4-1: 2018 standard for cyber security capability		
10	All type of switches & transceivers should be from same make.		
11	All Core switches should be from same make.		
12	Make / Brand : Any globally reputed Manufacturer presence in India		

10Gbps FO Transceiver

Sl. No	Technical Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	10 Gbps Single Mode Fiber Optic Transceiver		
2	10GBASE-LR Single Mode SFP+ Transceiver with Duplex LC Connector		
3	Support IEEE 802.3ae standard		
4	At least 10Km distance support on single mode fiber interface		
5	Transceiver module should be hot pluggable. MSA		

	Compliant		
6	Operating wavelength: 1310nm		
7	Secure Product Development Lifecycle Process Requirement Certification in accordance with IEC 62443-4-1: 2018 standard for cyber security capability		
8	All type of switches & transceivers should be from same make.		
9	All Core switches should be from same make.		
10	Make / Brand : Any globally reputed Manufacturer presence in India	.	

LC-LC Fibre Optic Patch Cord

Sl. No	Technical Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	LC - LC SM FO Duplex Patch Cord 5 Meter Length		
	The optical fiber patch cords shall comply with the following specifications:		
2	Optical Fiber – Single mode - OS1		
3	Connector: Zirconia ceramic ferrule		
4	Pre-radiuses and pre-polished ferrule		
5	Duplex Type		
6	Color-coded Yellow for Single mode		
7	Insertion Loss : <0.3 db		
8	Cable: 9/125, SM		
9	Return Loss: >/= 50dB for UPC		
10	Durability: 1000 mating cycle		
11	Working Temp: (0 deg. C to 60 deg. C)		
12	Length: 5 Meter		
13	All fiber items should be from same make.		
14	Make / Brand: Any globally reputed Manufacturer presence in India.		
LC-LC Fibre Optic Patch Cord			

Sl. No	Technical Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	LC - LC SM FO Duplex Patch Cord 2 Meter Length		
	The optical fiber patch cords shall comply with the following specifications		
2	Optical Fiber – Single mode - OS1		
3	Connector: Zirconia ceramic ferrule		
4	Pre-radiuses and pre-polished ferrule		
5	Duplex Type		
6	Color-coded yellow for Single mode		
7	Insertion Loss : <0.3 db		
8	Cable: 9/125, SM		
9	Return Loss: >/= 50dB for UPC		
10	Durability: 1000 mating cycle		

11	Working Temp: (- 10 deg. C to + 60 deg. C)		
12	Length: 2 Meter		
13	All fiber items should be from same make.		
14	Make / Brand: Any globally reputed Manufacturer presence in India.		
UTP CAT-6 Outdoor Cable			
Sl. No	**Technical Specification**	**Specification (Quoted / Applicable – by the bidder)**	**Complied (Yes / No)**
1	Category 6 Outdoor cable shall be compliant with ANSI/TIA/EIA-568-C.2 & and ISO/IEC 11801 channel performance up to 85 mtr.		
2	Category 6 Outdoor cable shall be capable of enhanced performance for transmission of high-speed data, digital and analogue voice and video (RGB) signals on LANs.		
3	All Category 6 Outdoor cables shall meet or exceed the following characteristics:		
4	Construction: 4 twisted pairs separated by internal X shaped, 4 channel, full separator. Half shall not be accepted.		
5	Category 6 Outdoor cable shall be UV Resistant		
6	Conductor dia: 23 AWG		
7	Insulation: Polyethylene		
8	Insulation Diameter: 1.04 ± 0.05 mm		
9	Sheath Thickness: 0.5 ± 0.15 mm		
10	Pairing: Two insulated conductor twisted together		
11	No. of Pair: 4 pair separated by a separator		
12	Sequential meter marking should be available		
13	Color of Jacket: Black		
14	Outer Jacket: PE		
15	Inner Jacket: PVC		
16	Filler : Central Slit Film Cross Filler		
17	Outer Diameter: 7.1 mm		
18	BEND RADIUS: 8 X CABLE DIAMETER		
19	Thickness of Inner Jacket: 0.45 mm ± 0.05 mm		
20	Thickness of Outer Jacket : 0.55 mm ± 0.05 mm		
21	Electrical Parameters		
22	CONDUCTOR RESISTANCE (DC): 9.38Ω ohms /100mtr@20˚C. MAX.		
23	RESISTANCE UNBALANCE: 5%MAX		
24	MUTUAL CAPACITANCE: 5.6 nF/100 mtrs MAX.		
25	CAPACITANCE UNBALANCE PAIR/GROUND: 330pF/100M MAX		
26	DELAY SKEW: ≤45 nS/100M		
27	NORMAL VELOCITY OF PROPAGATION: 69%		
28	IMPEDANCE: 100 ± 15% Ω		
29	Temperature Rating: (- 20 to +60 C)		
30	Packing : 305 Mtrs.		
31	Generally confirming to EIA/TIA 568-C.2 and IEC/ISO 11801		

32	All Network Cable should be from same make.		
33	Make / Brand: Any globally reputed Manufacturer presence in India		
6 Core SM 9/125 Outdoor Fibre Optic Armoured Cable			
Sl. No	**Technical Specification**	**Specification (Quoted / Applicable – by the bidder)**	**Complied (Yes / No)**
1	6 Core Single Mode Outdoor Armored Fiber Optic Cable		
2	Electro Chromium Coated Corrugated Steel Tape (ECCS)		
3	Central loose tube with jelly compound		
4	Sequential meter marking		
5	Armoured Design with Steel music Wire		
6	Outer Diameter: 7.2±0.5mm (for 6 Core Cable)		
7	Thickness of HDPE Jacket: 1.8±0.2mm		
8	Pulling Tension: Short Term (1000N)		
9	Crush Load: 2000N/100mm		
10	Bend Radius: Short Term (20D)		
11	The fiber type is a Matched Cladding Single Mode		
12	The fiber is optimized for operation at 1310 nm and at 1550 nm.		
13	Nominal Mode Field Diameter: 9.3 µm		
14	Cladding Diameter: 125 µm		
15	PMD (ps/km): ≤ 0.2		
16	Cable Cut-off Wavelength: 1260nm		
17	**Attenuation (of cable with fibers):**		
	At 1310 nm: 0.34 dB/km		
	At 1550 nm : 0.24 dB/km		
18	Operating Temperature should be within -20°C to +60°C		
19	Make / Brand: Any globally reputed Manufacturer presence in India.		
12 Core SM 9/125 Outdoor Fibre Optic Armoured Cable			
Sl. No	**Technical Specification**	**Specification (Quoted / Applicable – by the bidder)**	**Complied (Yes / No)**
1	12 Core Single Mode Outdoor Armored Fiber Optic Cable.		
2	Corrugated steel tape armoured		
3	Central loose tube with jelly compound		
4	Glass Yarns between steel tape & loose tube		
5	Sequencial meter marking		
6	The fiber should fulfill the requirement of ITU-T REC G.652D		
7	Outer Diameter: 9 ± 0.3mm (for 12 Core Cable)		
8	Thickness of HDPE Jacket: 1.8±0.2mm		
9	Pulling Tension: Short Term (2000N)		
10	Crush Load: 3000N/100mm		
11	Bend Radius: (20D)		

12	The fiber type is a Matched Cladding Single Mode		
13	The fiber is optimized for operation at 1310 nm and at 1550 nm.		
14	Nominal Mode Field Diameter: 9.2 µm		
15	Cladding Diameter: 125 µm		
16	PMD (ps/km): 0.2		
17	Cable Cut-off Wavelength: <= 1260nm		
18	Attenuation (of cable with fibers):		
	At 1310 nm: 0.36 dB/km		
	At 1550 nm : 0.22 dB/km		
19	Make / Brand: Any globally reputed Manufacturer presence in India .		

24 Core SM 9/125 Outdoor Fibre Optic Armoured Cable

Sl. No	Technical Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	24 Core Single Mode Outdoor Armoured Fiber Optic Cable.		
2	Corrugated steel tape armoured		
3	Central loose tube with jelly compound		
4	Glass Yarns between steel tape & loose tube		
5	Sequential meter marking		
6	The fiber should fulfill the requirement of ITU-T REC G.652D		
7	Outer Diameter: 9.5 ± 0.3mm (for 24 Core Cable)		
8	Thickness of HDPE Jacket: 1.8±0.2mm		
9	Pulling Tension: Short Term (2000N)		
10	Crush Load: 3000N/100mm		
11	Bend Radius: (20D)		
12	The fiber type is a Matched Cladding Single Mode		
13	The fiber is optimized for operation at 1310 nm and at 1550 nm.		
14	Nominal Mode Field Diameter: 9.2 µm		
15	Cladding Diameter: 125 µm		
16	PMD (ps/km): 0.2		
17	Cable Cut-off Wavelength: <= 1260nm		
18	**Attenuation (of cable with fibers):**		
	At 1310 nm: 0.36 dB/km		
	At 1550 nm : 0.22 dB/km		
19	Make / Brand: Any globally reputed Manufacturer presence in India		
Outdoor Weatherproof Customized Rack			

Sl. No	Feature	Technical Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	Metal Guage	18 SWG or Better		
2	Colour	Off White / Gray / Cream		

3	Colour Coating	Powder Coated		
4	Dimension	As Per Requirement (Weather Proof Design with cooling arrangement)		
	(W X H X D)			
5	Lock Facility	Double Lock facility		
Double Door DB Box				
Sl. No	**Feature**	**Technical Specification**		
1	Type	8 Way SPN MCB DB		
2	Enclosure	Double Door with IP42/43 protection		
3	Isolator	1 No. 32 Amp Double Pole (Loaded)		
4	MCB	6 Nos. 10 Amp / 6 Amp Single Pole (loaded)		
5	Supply	Single Phase 250V AC		
6	Brand / Make	Any globally reputed Manufacturer presence in India.		

- Bidder should submit all relevant data sheet/brochure of all quoted items and should also availablein respective OEM's official website.
- Bidder should indicate items mentioned in the OEM data sheet / brochure by marketing as mentioned in minimum specification in the RFP

Authorized Signatory (Signature In full): _____

Name and title of Signatory: _____

Stamp of the Company: _____

Zone - 3

Minimum Specification of 5 MP IR Vari-Focal Bullet Network Camera

Sl. No	Feature	Technical Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	Image Sensor	1/2.8" CMOS Sensor or Better		
2	Resolution	Minimum 2592 (H) × 1944 (V)		
3	Scanning System	Progressive		
4	Electronic Shutter Speed	Auto/Manual 1/15 s–		

		1/100,000 s		
5	Min. Illumination	0.01 lux@F1.4 (Color) or Better		
		0.01 lux@F1.4 (B/W) or Better		
		0 lux (Illuminator on)		
6	S/N Ratio	>52 dB		
7	IR Illumination Distance	50 meter or Better		
8	Illuminator On/Off Control	Auto / Manual		
9	Lens Type	Motorized vari-focal		
10	Focal Length	OEM fitted 2.8 mm–12 mm or Better		
11	Iris Control	Auto/ Mannual		
12	**Professional, intelligent**			
	IVS (Perimeter Protection)	Support Intrusion, tripwire		
13	Video Compression	H.265+/ H.265/ H.264/ MJPEG		
14	Video Frame Rate	Main stream: 2592 × 1944 @ 30 fps or Better		
		Sub stream 1: D1 @ 30 fps or Better		
		Sub stream 2: 2048 × 1536 @ 8 fps or Better		
15		Sub stream 3: 1980 × 1080 @ 30 fps or Better		
16	Stream Capability	4 streams or Higher		
17	Resolution	2592 × 1944; 2592 × 1520; 2048 × 1536; 1920×1080; 720p; D1; VGA; 2CIF; CIF.		
18	Bit Rate Control	CBR/VBR		
19	Day/Night	Auto(ICR)/Color/B/W		
20	BLC	Should Support		
21	WDR	120 dB or Higher		
22	White Balance	Auto/ Natural/ Street lamp/ Outdoor		
23	Gain Control	Auto		
24	Noise Reduction	3D NR		
25	Motion Detection	Should Support		
26	Region of Interest (RoI)	Should Support		
27	Mirror	Should Support		
28	Image Rotation	Should Support		
29	Privacy Masking	Should Support		
30	Alarm Event	Storage full; network disconnection; IP conflict; motion detection; video tampering; intrusion; tripwire; audio detection.		
31	SDK and API available	Yes		

32	Network Protocol	HTTP; TCP; UDP; RTSP; RTCP; SMTP; FTP; SFTP; DHCP; DNS; DDNS; NTP; Multicast; ICMP; IGMP; PPPoE; SNMP; TLS/ SSL; Telnet/ SSH.		
33	Interoperability	ONVIF (Profile S/Profile G/Profile T)		
34	Storage	Micro SD card (support minimum 256 GB)		
35	Mobile Client	iOS; Android		
36	Operation Temperature / Humidity	-10 ºC to 55 ºC / Less than 95% RH		
37	Weather Proof Standard	IP67		
38	Certifications	FCC, CE, UL, BIS, IK10, NEMA 4X		
39	Make / Brand	Any globally reputed Manufacturer presence in India & having manufacturing facility in India.		

2 Megapixel 33x CMOS Sensor IR PTZ Network Camera

Sl no.	Feature	Technical Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	Image Sensor	1/2.8" CMOS or Better		
2	Effective Pixels	1920(H) x 1080(V) or Better		
3	Minimum Illumination	Colour: 0.001 Lux @F1.5; B/W: 0 Lux with IR		
4	Focal Length	The Camera should be provided with an OEM fitted 4.6~152 mm of focal length or Better		
5	White Balance	Auto, ATW, Indoor, Outdoor, Manual		
6	Focus Control	Auto / Manual		
7	Electronic Shutter	1/1s~1/30,000s or Better		
8	AGC control	Auto / Manual		
9	Back Light Compensation	WDR: 120dB or Better)		
10	Optical Zoom	33x or Higher		
11	Digital Zoom	16x or Higher		
12	Pan Travel	0°~360° endless, Pan Speed: 0.1° ~ 120°/sec		
13	Tilt Travel	- 15° ~ 90° auto flip 180°, Tilt Speed: 0.1° ~120°/sec		
14	Manual Speed	Pan: 0.1° ~160° /s; Tilt: 0.1° ~120° /s		

15	Presents & Pattern	300 Preset, 4 Pattern, 8 Patrols		
16	Present Speed	Pan: 240° /s; Tilt: 180° /s		
17	IR Illumination Distance	200 meter or Better		
18	Privacy Masking	24 Areas or More		
19	Power up Action	Auto restore to previous PTZ and lens status after power failure		
20	Day/Night: IR Cut Filter	Auto (ICR) / Colour / B/W		
21	Video Compression	H.265+/H.265 & H.264+/H.264		
22	Video Streaming	Main stream: PAL: 25 fps (1920 x 1080, 1280 x 720); NTSC: 30 fps (1920 x 1080, 1280 x 720). Sub stream: PAL: 25 fps; NTSC: 30 fps. Third stream: PAL: 25 fps; NTSC: 30 fps.		
23	Audio Compression	G.711a/G.711M/ADPCM/ AAC_LC		
24	Motion Detection	Should Support		
25	ROI	Should Support		
26	Audio Streaming	1/1 channel In/Out		
27	Auto Tracking	Should Support		
28	IVS	Tripwire, Intrusion, bright lights etc.		
29	Networking	RJ-45/ RS485		
30	Protocols	IPv4; IPv6; HTTP; TCP; RTSP; SMTP; FTP/ SFTP; DHCP; DNS; DDNS; NTP; Multicast; IIGMP; PPPoE; SNMP.		
31	Event Trigger	Motion detection, Video tampering , Scene changing, Network disconnection, IP address conflict		
32	Alarm	6/2 channel In/Out		

33	Operating Temperature	-10°C ~ 55°C / Less than 95% RH		
34	Weather Proof Standard	IP66/ IP67		
35	Power Source	AC24V, PoE++ Both Support		
36	Certifications	FCC, CE, UL, BIS, IK10		
37	Make / Brand	Any globally reputed Manufacturer presence in India & having manufacturing facility in India.		

ANPR Camera

Sl no.	Feature	Technical Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	Main Processor	High performance embedded processor to extract and analyse vehicle metadata		
2	Image Sensor	1/2.8'' CMOS or Better		
3	Lens	Built-in 10 mm – 50 mm motorized vari-focal lens or Better		
4	Shutter Mode	Single shutter		
5	Electronic Shutter Speed	1/25 s–1/100000 s (manual/auto) or Better		
6	Exposure Mode	Full auto/ manual/ customized auto/ customized		
7	Iris Control	Fixed iris/manual iris/auto iris/P iris/ DC Drive		
8	Image Resolution	2688 × 1520 or Higher		
9	Video Resolution	4MP (2688 × 1520)/ 2MP (1920 × 1080)/ 720P (1280 × 720)/ 4CIF (704 × 576		
10	Video Frame Rate	Main Stream: 25fps (2688 × 1520, 1920 x 1080); Sub stream: 25 fps (1920 × 1080, 1280 x 720)		
11	Video Compression	H.265+/H.265/H.264M/H.264H /H.264B/MJPEG		
12	Picture Encoding Format	JPEG		
13	WDR	Minimum 140dB		

14	White Balance	Auto/outdoor/manual/local white balance/natural		
		light/street light		
15	Noise Reduction	2DNR/3DNR		
16	HLC	Should Support		
17	Bad Pixel Correction	Should Support		
18	Edge Enhancement	Should Support		
19	Storage	Support SD card (Minimum 128GB)		
20	Image Tampering Prevention	Should Support Watermark and verification are available for videos and pictures		
21	Security	Authorized username and password, MAC address binding, HTTPS encryption, and network access control		
22	License Plate Recognition	Adopts self-developed algorithm to recognize license plates combining numbers and letters		
23	Vehicle Type Recognition	Should Support		
24	Vehicle Color Recognition	Should Support		
25	Motor Vehicle Violation Capture	Should Support		
26	Video Metadata	Should Support Motor vehicle: License plate, vehicle type, vehicle color, license plate color, vehicle logo, and more. Non-motor vehicle: Type (two-wheelers, three-wheelers), color, wearing a helmet or not, passenger (1, 2, 3, or more passengers)		
27	Vehicle recognition rate	≥98%		
28	Network	1 RJ-45 Ethernet port, 10/100/1000M Network transmission		
29	Alarm Input & Output	1 channel In & 1 channel Out		
30	Audio Input & Output	1 channel In & 1 channel Out		
31	Illuminator Number	4 illuminators (850nm IR LED illuminators, brightness adjustable)		
32	Power Supply	12V DC, 24V DC, PoE		

33	Operating Temperature	-10°C to 55°C		
34	Protection Grade	IP67/ IK10 or Better		
35	Certification	FCC, CE, BIS		

General Surveillance Management Server

Sl. No	Feature	Technical Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	Processor	Intel Xeon-Silver 4216 Processor or AMD EPYC 7282 or Higher		
2	No. of Core	16 Core or Higher		
	Processor speed	2.5 GHz or Higher		
7	Operating System	Microsoft Windows Server 2022 16 Core Standard loaded		
8	Generation	Gen10 or latest		
9	HDD	2 x 480GB SATA / SSD		
10	Power	500W Flex Slot Platinum Hot Plug Low Halogen Power Supply Kit		
11	Storage controller	Smart Array E208i-a SR Gen10 (8 Internal Lanes/No Cache) 12G SAS Modular LH Controller		
12	Memory, standard	64 GB DDR4 3200MHz with 16 DIMMs		
13	Mouse	Optical Mouse		
14	Keyboard	Keyboard		
15	Ethernet	Ethernet 1Gb X 4-port 331T Adapter		
16	Mounting	1x CMA for rail kit		
17	Make / Brand	Any globally reputed Manufacturer presence in India.		

Central Video Monitoring Software

Sl. No	Feature	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	Video Management Software with high scalable design and distributed deployment, easily expand the supported channels to 20,000 and central storage capacity to 4 PB. The multi-site function allows to incorporate multiple VMS platforms into one, and conveniently show their information on one PC client. With hot standby and N+1 redundancy.		

2	VMS Shall be based on Microsoft windows OS.		
3	VMS shall be open to IP camera integration in that respects VMS should support IP Cameras from Multiple OEM.		
4	The VMS shall be ONVIF compliant.		
5	VMS shall be open to any NAS (CIFS, SMB 2.0) integration.		
6	VMS shall support H.264 and MJPEG stream for both live view and Recording independently. Compression rate shall be manageable.		
7	The Video Management System shall support cameras with resolutions ranging from Standard Definition, High Definition (HD) and higher resolution		
8	The Video Management System shall show video across 4 displays per workstation - each display can have up to 25 viewing panes.		
9	VMS shall be able to connect with video wall through multi-display client.		
10	Users shall be able to move any image from one display screen to another via drag-and-drop		
11	The VMS shall allow the overlay of time and date information on live video panes		
12	Users shall be able to digitally zoom and also digitally scroll live video from any camera using the mouse wheel		
13	Users shall be able to replay currently viewed live video for replays from 10, 15 or 30 seconds before current time or from alarm time.		
14	The VMS shall allow users to reset the event count for a camera It should be able to display camera information in the On-Screen Display (OSD).		
	a. Camera name		
	b. Date and time		
15	VMS shall be accessible using any desktop client utility for Live view and Archive search		
16	VMS should support the two-way audio so that users shall be able to listen audio from multiple cameras through PC speakers and may speak to one or more cameras through a PC microphone		
17	VMS shall allow managing initial client logon, system configurations, logging, remote administration of recording servers, devices, security, rules, alerts and logging.		
18	VMS shall support at least 3 levels of users with various privileges to access the system functionality. Each category of users shall have selectable rights to perform various operations like Camera add/delete, Change camera settings, Configure storage, Control PTZ cameras, User management, etc		
19	VMS shall maintain a continuous log of server status messages, Camera connectivity, Storage status, Recording ON/OFF, User activity logs , etc which shall be accessed from the Workstations using different filters		

20	Each video streams shall be individually and independently configurable in term of resolution, frames and bandwidth			
21	VMS shall support video streams up to at least 25/30fps			
22	VMS shall support at least CIF, 2CIF, 4CIF/D1 and HD/Megapixel resolution			
23	PTZ Control	All PTZ control shall be user-restricted		
		Users shall be able to zoom a PTZ camera in or out using the PC mouse		
		Users shall be able to pan, tilt and zoom a PTZ camera displayed in a video pane or monitor using a joy stick on one of the supported CCTV keyboards		
		Users shall be able to adjust the iris of a PTZ camera using the on screen PTZ controls or a CCTV keyboard:-Open iris-Close-Auto-iris		
		The Video Management System shall support the following for cameras using the ONVIF interface or Camera Gateway		
		a. Pan, tilt and zoom control with mouse and joystick		
b. Go to pre-set				
c. Set pre-set				
24	The VMS shall have the capability of operating in an environment that requires multi-tasking, when using multiple cameras spread over a wide area			
25	VMS should have Pre and Post Event Recording			
26	VMS should have Motion Detection technology			
27	Software provides remote interface with a full live feed view, with digital zoom options, control of PTZ cameras, multiple simultaneous feeds, and image quality settings to improve performance through bandwidth reduction			
28	Software has built in feature to bring camera observation to mobile devices (require a software on a mobile device to view)			
29	Each camera setting can be adjusted individually according to client's requirement			
30	Schedule operation - All cameras can be fully scheduled individually			
31	View and record multiple cameras			
32	As many playback sessions as are required can be displayed at once			
33	Automatic control of supported PTZ cameras			
34	Alerting by email (with images)			

35	Software should have built in feature to bring camera observation to mobile devices (require a software on a mobile device to view)		
36	The software shall allow:		
A	Live display of cameras.		
B	Live display of camera sequences.		
C	Control of PTZ cameras.		
D	Playback of archived video.		
E	Retrieval of archived video.		
F	Instant Replay of live video.		
G	Configuration of system settings.		
H	Configuration and programming of P/T/Z cameras, features like camera addressing, BLC, auto tours, pre-sets etc.		
I	Video Analytics		
37	The software should be able to do video recording on any of the following options - inbuilt hard disks on the server, direct attached storage boxes attached to servers, network attached storage, storage area network.		
38	The software should be capable of handling camera and alarm icons on area maps. The area map should be configurable to pop up upon the receipt of an alarm received from a camera on the map. This can be on the same or other monitors on the PC.		
39	The software shall be able to select the required recording based on the time recording was activated, the duration of recording, operator activated recording, event activated recording.		
40	It shall be possible to search for recordings in the software by camera, date and time. If a data and time is specified, playback shall commence from that date and time. It shall be possible to playback more than one camera simultaneously.		
41	It Software shall allow operators to bookmark the concern videos & browse through a list of all bookmarks created on the system and select any bookmarked event for viewing. Software shall support industry standard for the interface of IP-based physical security products: ONVIF and shall be based on a server/client model.		
42	VMS should use two independent streams Camera or IP encoders: One for Live View and other for recording. All settings for each stream including resolution, codecs, frame rate and compression level may be choose independently without affection overall system performance and IP device functionality.		
43	Software shall have the capacity to communicate with IP Cameras / Encoders using HTTPS secure protocol. It shall support any form of IP network connectivity, including: LAN/ WAN/ VPN/ Internet.		
44	All audio streams supplied from IP Camera / Encoders shall be digitally encoded in g711 (u-law)/ g721/ g723		

	or AAC compression formats and recorded simultaneously in real time.			
45	Software shall offer redundant architecture for recording in server. Roles shall move from one server to another without disturbing the regular operations. To minimize network traffic, Software must have ability to configure the key frame interval (I-frame) per second.			
46	All video streams supplied from IP cameras / Encoders shall be digitally encoded in MPEG-4/MPEG-2/MJPEG and H.264 compression formats and recorded simultaneously in real time			
47	Each camera's bit rate, frame rate and resolution shall be set independently and changing these settings will not affect the recording and display settings of other cameras.			
48	Software shall support dynamically switch the video resolution according to the Tile Size on Monitoring Screen. High Resolution Video feed while watching single camera on screen and Low Resolution Video feed while watching Cameras in Multiple tiles.			
49	Removed			
50	Removed			
51	Devices	Should Support Minimum 2,000 devices Per Server		
52	Auto-Registered Devices	Should Support Minimum 1,000 devices Per Server		
53	Video Devices and Channels	Should Support Minimum 1,000 devices; 2,000 channels Per Server		
54	Devices Added by ONVIF Protocol	Should Support Minimum 1,000 devices; 2,000 channels		
55	ANPR Channels	Should Support Minimum 500 channels		
56	Total Devices	Should Support Minimum 10,000 locations; 65,000 cameras		
57	Total Incoming Bandwidth	Should Support Minimum 600 Mbps		
58	Incoming Video Bandwidth	Should Support Minimum 600 Mbps		
59	Incoming Picture Bandwidth	Should Support Minimum 200 Mbps		
60	Total Outgoing Bandwidth	Should Support Minimum 600 Mbps		
61	Outgoing Video Bandwidth	Should Support Minimum 600 Mbps		
62	Outgoing Picture	Should Support Minimum		

	Bandwidth	200 Mbps		
63	Total Storage Bandwidth	Should Support Minimum 600 Mbps		
64	Video Storage Bandwidth	Should Support Minimum 600 Mbps		
65	Picture Storage Bandwidth	Should Support Minimum 200 Mbps		
66	Prerecording Bandwidth for Alarm Recordings	Should Support Minimum 400 Mbps		
67	Maximum Capacity of Central Storage (IPSAN)	Should Support Minimum 400 TB, depending upon server capacity		
68	Total Events	Should Support Minimum 100per second		
69	Storage of Events or Alarms without Pictures	Should Support Minimum 40 per second		
70	Alarms with Snapshots (Stored on Devices)	Should Support Minimum 20 per second		
71	Removed			
Client Workstation PC				

Sl. No	**Feature**	**Technical Specification**		
1	Form factor	Tower Type		
2	Operating System	Win 11 SL/ Home 64 bit		
3	Processor & Chipset	Intel i7 12700/ AMD Ryzen 7 5700 or higher; Intel Q670/ AMD Pro 565 or higher		
4	RAM	32 GB DDR4 RAM		
5	Graphics Card	Minimum 4 GB		
6	Storage	512GB NVMe SSD or higher		
7	Power Supply	Min. 400W with 90% or higher efficiency		
8	I/O	Wireless Keyboard and Wireless Mouse, WiFi + BT, Total 10 USB ports, HDMI, DP/ VGA port		
9	Certifications	ISO 9001, 14001, 20001, 27001, EPEAT Gold, ROHS, CE, FCC, UL		
Sl. No	**Feature**	**Technical Specification**		
1	Main Processor	64-bit high-performance Intel processor or Higher		
2	Memory	Minimum 4GB		
3	Operating System	Embedded LINUX / Windows		
4	Video Stream Mode	640Mbps incoming and recording 320Mbps forwarding, 64Mbps playback		
5	Storage	Should Support 16 HDDs,		

		16TB or higher capacity for each SATA HDD.		
6	miniSAS	1 miniSAS ports, for storage extension		
7	HDD Installation	Additional HDD bracket, HDD hot-swap, HDD online replacement		
8	HDD Mode	Single, RAID 0/1/5/6/10/50/60, hotspare		
9	HDD Manager	Non-working HDD hibernation to guarantee sound ventilation, reduce power consumption and enhance HDD life span HDD bad track mapping to enhance HDD life span		
10	RAID Rebuild	Dynamically adjust RAID rebuild speed to guarantee system load balance		
11	Logic Volume Manager	Support iSCSI volume management, NAS(SMB/NFS/FTP) volume management		
12	Snapshot	Support snapshot function, create user volume to back data.		
13	Extract Frame	Support extracting P frame function. Customized extracting period and frame rate setup		
14	Cluster Service	N+M cluster service		
15	ANR	After disconnection, system can download the record file from the SD card on the network camera to maintain the full record file.		
16	Interface	2 data RJ-45 ports (10/100/1000Mbps)		
17	Network Mode	Multi-address, Fault-tolerance, Load balance, Link aggregation		
18	Network Function	HTTP, HTTPs, TCP/IP, IPv4/IPv6, UPnP, RTP, RTCP, RTSP, UDP, SMTP, NTP, DHCP, DDNS, IP Filter, PPPoE,DDNS, iSCSI, SMB, NFS, FTP.		
19	Interoperability	ONVIF		
20	Power Supply	AC100V ~ 240V,1 + 1		

		Redundant power		
21	Working Conditions	5°C ~ 40°C		
22	Certification	FCC, CE, UL, BIS, IK10		
23	Make / Brand	Any globally reputed Manufacturer presence in India.		
8 Ethernet Port PoE Switch				
Sl. No	**Technical Specification**			
1	No of Ports	8 10/100/1000 Base-T PoE ports & 2 Gigabit SFP ports		
2	Switching Capacity	20 Gbps or Better		
3	Forwarding Rate	Minimum 14.80 Mbps		
4	POE / POE+	IEEE 802.3af and 802.3at		
5	POE Power Budget	Minimum 130 W or Higher		
6	Power Supply	AC: 100V -240V, 50Hz ±10%		
7	Environment	Operating temperature/ Humidity: 0°C-45°C, 10%-90% non-condensation		
		Storage temperature/ Humidity: 0°C-70°C; 5%-95% non-condensation		
		Power Saving by: Link status, LED or Port Shutoff		
8	MAC Switching	Static configuration and dynamically learning of MAC address		
		Check and delete MAC address		
		Configuring of MAC address aging time		
		Up to 256 Static MAC entries		
		Limit on MAC address learning number		
		MAC address filtering function		
		MAC address size 8K		
9	Port Mirroring	One-to-One, Many-to-One		
		Supports Mirroring for Tx/Rx/Both		
10	V LAN	4K VLAN entries, 256 static VLAN		
		GVRP		
		1:1 and N:1 VLAN Mapping		
		Q-in-Q		
		Private VLAN, Voice		

		VLAN		
11	STP	802.1D (STP), 802.1W (RSTP), 802.1S (MSTP)		
		BPDU protection, root protection and ring protection		
12	Multicast	IGMP v1/v2/v3		
		IGMP Snooping		
		IGMP Fast Leave		
		Multicast group policy and multicast number limit		
13	IPv6	ICMPv6, DHCPv6, ACLv6 and IPv6 Telnet		
		IPv6 Neighbor Discovery		
		MLD v1/v2		
		MLD Snooping		
14	QoS	Traffic classification of each field of L2/L3/L4 protocol headers		
		CAR traffic control		
		802.1P/DSCP priority remark		
		Multiple queuing algorithms such as SP, WRR or SP+WRR		
		WRED		
		Traffic supervision and traffic shaping		
15	Security features	Identification and filtering of L2/L3/L4 based ACL		
		DOS or TCP attacks Prevention		
		Suppression of broadcast, multicast and unknown unicast packet		
		Port isolation		
		Port security, IP+MAC+port binding		
		DHCP Snooping, DHCP Option 82		
		IEEE 802.1x certification		
		Radius and Tacacs+		
16	Reliability	Static / LACP link aggregation		
17	Management and Maintenance	Console, Telnet, SSH 2.0		
		WEB based management		
		SNMP v1/v2/v3		
		TFTP		
		RMON		

18	Certification	CE, FCC, IEC 62368-1		
19	Make / Brand	Any globally reputed Manufacturer presence in India.		

All SFP Core Switch

Sl. No	Technical Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	Layer-3 Fully Managed Switch having 24x 1G SFP slots with 4x combo 10/100/1000BaseT ports & 4x 10G SFP+ slots.		
2	SFP slots should support IEEE 802.3z & IEEE 802.3u compliant transceivers & SFP+ slots should support IEEE 802.3z & IEEE 802.3ae compliant transceivers		
3	The switch should be 19" Rack Mount size.		
	THE SWITCH SHOULD HAVE FOLLOWING BASIC FEATURE FROM DAY ONE:		
4	The switch should have RJ45/mini-USB console port for Out of band CLI management & ethernet port for out of band IP management. It should have minimum one alarm port.		
5	The switch should have intelligent fans with sensor that provides different fan speed based on different temperature.		
6	The switch should have support for redundant power supply.		
7	The switch should have built-in hardware feature for both external event detection & alarm action		
8	The switch should have switching capacity at least 128Gbps & packet forwarding rate at least 95Mpps for 64-bytes packet size		
9	The switch should have non-blocking architecture & wire-speed performance under fully loaded condition.		
10	The switch should have virtual stacking capability of at least 25 switches in a stack.		
11	The switch should have physical stacking capability with at least 8 units per stack & at least 40Gbps of stacking bandwidth.		
12	The switch should have feature for flexible management of switch resources		
13	The switch should have 6kV Surge protection on all RJ45 access ports		
	THE SWITCH SHOULD HAVE FOLLOWING LAYER-2 FEATURE FROM DAY ONE:		
14	a) At least 64K MAC address table size. At least 1K static MAC support.		
15	b) Jumbo frame support for at least 12KB frame size.		
16	c) Flow-control features: 802.3x for full duplex & Head-of-line blocking prevention.		
17	d) UDLD or equivalent features.		
18	e) IEEE 802.1D (STP), 802.1w (RSTP) & 802.1s (MSTP) with		

	at least 64 MSTP instances, Root Guard or equivalent features.		
19	f) Avoidance of the loop occurring in a single port connected to an unmanaged switch/hub by shutting down the corresponding port or corresponding VLAN		
20	g) Ethernet Ring Protection Switching (ERPS) with maximum 50milli second recovery time.		
21	h) IEEE 802.1AX & 802.3ad Link aggregation with at least 32 groups per device & at least 8 ports per groups. LACP.		
22	i) Port mirroring with at least 4 mirroring sessions. Should support Tx, Rx & both based mirroring. Should support one-to-one & many-to-one mirroring, flow-based mirroring, RSPAN.		
23	j) IGMP v1 v2 & v3 snooping with at least 8000 snooping groups. Should support IGMP snooping per VLAN, host-based IGMP snooping fast leave, at least 128 static IGMP groups, L2 multicast filtering		
24	k) MLD v1 & v2 snooping with at least 4000 snooping groups. Per VLAN MLD snooping. At least 128 static MLD groups.		
25	l) At least 4K VLAN groups, 802.1Q, 802.1v protocol based VLAN, Q-in-Q, GVRP with at least 4K dynamic VLANs, Voice VLAN, Port-based VLAN, MAC-based VLAN, private VLAN, VLAN trunking, MVR (Multicast VLAN Registration) or equivalent feature.		

	THE SWITCH SHOULD HAVE FOLLOWING LAYER-3 FEATURE FROM DAY ONE:		
26	a) At least 16K routing table entry size with at least 512 static route entry support.		
27	b) Default route, RIPv1, RIPv2, RIPng, OSPFv2, OSPFv3, BGPv4, BGPv4+, Policy based route, Route preference, Route Redistribution, Bidirectional Forwarding Detection, MSDP		
28	c) Multicast forwarding table size: at least 2000, IGMPv1v2v3, MLDv1v2, IGMP filtering, static IP multicast route, PIM-DM, PIM-SM, PIM-SSM, PIM-Sparse-Dense mode, DVMRPv3, PIM-SMv6.		
29	e) IPv6 tunnelling, VRRP, IP helper		
	THE SWITCH SHOULD HAVE FOLLOWING QOS FEATURE FROM DAY ONE:		
30	a) IEEE 802.1p, DSCP, at least 8 queues per port.		
31	b) Queue handling methods: strict, weighted round robin, weighted deficit round robin, WRED		
32	c) CoS & classification of packets based on following parameters: VLAN ID, 802.1p priority, MAC address, Ether type, DSCP, protocol type, IPv4 address, TCP/UDP port number, IPv6 address, IPv6 traffic class		
33	d) Port & flow based bandwidth control with minimum granularity 8Kbps.		
34	e) Time based QoS.		
	THE SWITCH SHOULD HAVE FOLLOWING SECURITY FEATURE FROM DAY ONE:		
35	a) Access control list based on VLAN, MAC address, 802.1p priority, DSCP, protocol type, TCP/UDP port,		

	IPv4 address, IPv6 address, IPv6 traffic class		
36	b) Time based ACL.		
37	c) Binding of IP address & MAC address with the interface. Dynamic ARP Inspection. IP Source Guard. DHCPv6 Guard, IPv6 Route Advertisement Guard, IPv6 Neighbour Discovery Inspection, Duplicate Address Detection		
38	d) SSHv2 for both IPv4 & IPv6, SSL (TLS 1.2) for both IPv4 & IPv6, Port security with at least 12K MACs per port.		
39	e) Broadcast, multicast & unicast storm control.		
40	f) Protection of the CPU from protocol control packet attack.		
41	g) DHCP server screening, DHCP client filtering, ARP spoofing prevention, BPDU attack prevention, DoS attack prevention		
42	h) IEEE 802.1x -- RFC 3580, web-based access control, MAC based access control, guest VLAN, Microsoft NAP, RADIUS accounting.		
43	i) Authentication supported based on : Local data base, RADIUS server		
44	j) Web based access control for IPv6		
45	k) At least 4 level user account for management access. RADIUS & TACACS+ authentication for management access.		
	THE SWITCH SHOULD HAVE FOLLOWING MANAGEMENT FEATURE FROM DAY ONE:		
46	a) Web based -GUI (IPv4 & IPv6), CLI, telnet server & client (IPv4 & IPv6) , TFTP client (IPv4 & IPv6), FTP client (IPv4 & IPv6), SFTP server, Zmodem, SNMPv1v2cv3, Syslog. sFlow, ICMPv6.		
47	b) RMONv1 & v2, LLDP, LLDP-MED, BooTP & DHCP client supporting both IPv4 & IPv6, DHCP relay option 82, DHCP relay option 60 & 61.		
48	c) Multiple images & configurations, SNTP, debug		
49	d) 802.3ah ethernet link OAM, 802.1ag CFM, Dying gasp.		
50	e) Inbuilt power saving technique on all Gigabit RJ-45 ports, IEEE 802.3az		
51	Secure Product Development Lifecycle Process Requirement Certification in accordance with IEC 62443-4-1: 2018 standard for cyber security capability		

52	All type of switches & transceivers should be from same make.		
53	All Core switches should be from same make.		

Copper Core Switch

Sl. No	Technical Specification	**Specification (Quoted / Applicable – by the bidder)**	**Complied (Yes / No)**

1	Core Switch - Layer-3 Fully Managed Switch having 20 X 1Gbps Copper Ports with 4x combo 1G SFP slots & 4x 10G SFP+ slots		
2	SFP slots should support IEEE 802.3z & IEEE 802.3u compliant transceivers & SFP+ slots should support IEEE 802.3z & IEEE 802.3ae compliant transceivers		
3	The switch should be 19" Rack Mount size.		
	THE SWITCH SHOULD HAVE FOLLOWING BASIC FEATURE FROM DAY ONE:		
4	The switch should have RJ45/mini-USB console port for Out of band CLI management & ethernet port for out of band IP management. It should have minimum one alarm port.		
5	The switch should have intelligent fans with sensor that provides different fan speed based on different temperature.		
6	The switch should have support for redundant power supply.		
7	The switch should have built-in hardware feature for both external event detection & alarm action		
8	The switch should have switching capacity at least 128Gbps & packet forwarding rate at least 95Mpps for 64-bytes packet size		
9	The switch should have non-blocking architecture & wire-speed performance under fully loaded condition.		
10	The switch should have virtual stacking capability of at least 25 switches in a stack.		
11	The switch should have physical stacking capability with at least 8 units per stack & at least 40Gbps of stacking bandwidth.		
12	The switch should have feature for flexible management of switch resources		
13	The switch should have 6kV Surge protection on all RJ45 access ports		
	THE SWITCH SHOULD HAVE FOLLOWING LAYER-2 FEATURE FROM DAY ONE:		
14	a) At least 64K MAC address table size. At least 1K static MAC support.		
15	b) Jumbo frame support for at least 12KB frame size.		
16	c) Flow-control features: 802.3x for full duplex & Head-of-line blocking prevention.		
17	d) UDLD or equivalent features.		
18	e) IEEE 802.1D (STP), 802.1w (RSTP) & 802.1s (MSTP) with at least 64 MSTP instances, Root Guard or equivalent features.		
19	f) Avoidance of the loop occurring in a single port connected to an unmanaged switch/hub by shutting down the corresponding port or corresponding VLAN		
20	g) Ethernet Ring Protection Switching (ERPS) with maximum 50milli second recovery time.		
21	h) IEEE 802.1AX & 802.3ad Link aggregation with at least 32 groups per device & at least 8 ports per groups. LACP.		
22	i) Port mirroring with at least 4 mirroring sessions.		

	Should support Tx, Rx & both based mirroring. Should support one-to-one & many-to-one mirroring, flow-based mirroring, RSPAN.		
23	j) IGMP v1 v2 & v3 snooping with at least 8000 snooping groups. Should support IGMP snooping per VLAN, host-based IGMP snooping fast leave, at least 128 static IGMP groups, L2 multicast filtering		
24	k) MLD v1 & v2 snooping with at least 4000 snooping groups. Per VLAN MLD snooping. At least 128 static MLD groups.		
25	l) At least 4K VLAN groups, 802.1Q, 802.1v protocol based VLAN, Q-in-Q, GVRP with at least 4K dynamic VLANs, Voice VLAN, Port-based VLAN, MAC-based VLAN, private VLAN, VLAN trunking, MVR (Multicast VLAN Registration) or equivalent feature.		
	THE SWITCH SHOULD HAVE FOLLOWING LAYER-3 FEATURE FROM DAY ONE:		
26	a) At least 16K routing table entry size with at least 512 static route entry support.		
27	b) Default route, RIPv1, RIPv2, RIPng, OSPFv2, OSPFv3, BGPv4, BGPv4+, Policy based route, Route preference, Route Redistribution, Bidirectional Forwarding Detection, MSDP.		
28	c) Multicast forwarding table size: at least 2000, IGMPv1v2v3, MLDv1v2, IGMP filtering, static IP multicast route, PIM-DM, PIM-SM, PIM-SSM, PIM-Sparse-Dense mode, DVMRPv3, PIM-SMv6.		
29	e) IPv6 tunnelling, VRRP, IP helper		
	THE SWITCH SHOULD HAVE FOLLOWING QOS FEATURE FROM DAY ONE:		
30	a) IEEE 802.1p, DSCP, at least 8 queues per port.		
31	b) Queue handling methods: strict, weighted round robin, weighted deficit round robin, WRED		
32	c) CoS & classification of packets based on following parameters: VLAN ID, 802.1p priority, MAC address, Ether type, DSCP, protocol type, IPv4 address, TCP/UDP port number, IPv6 address, IPv6 traffic class		
33	d) Port & flow based bandwidth control with minimum granularity 8Kbps.		
34	e) Time based QoS.		
	THE SWITCH SHOULD HAVE FOLLOWING SECURITY FEATURE FROM DAY ONE:		
35	a) Access control list based on VLAN, MAC address, 802.1p priority, DSCP, protocol type, TCP/UDP port, IPv4 address, IPv6 address, IPv6 traffic class		
36	b) Time based ACL.		
37	c) Binding of IP address & MAC address with the interface. Dynamic ARP Inspection. IP Source Guard. DHCPv6 Guard, IPv6 Route Advertisement Guard, IPv6 Neighbor Discovery Inspection, Duplicate Address Detection		
38	d) SSHv2 for both IPv4 & IPv6, SSL (TLS 1.2) for both IPv4 & IPv6, Port security with at least 12K MACs per port.		

39	e) Broadcast, multicast & unicast storm control.		
40	f) Protection of the CPU from protocol control packet attack.		
41	g) DHCP server screening, DHCP client filtering, ARP spoofing prevention, BPDU attack prevention, DoS attack prevention		
42	h) IEEE 802.1x -- RFC 3580, web-based access control, MAC based access control, guest VLAN, Microsoft NAP, RADIUS accounting.		
43	i) Authentication supported based on : Local data base, RADIUS server		
44	j) Web based access control for IPv6		
45	k) At least 4 level user account for management access. RADIUS & TACACS+ authentication for management access.		
	THE SWITCH SHOULD HAVE FOLLOWING MANAGEMENT FEATURE FROM DAY ONE:		
46	a) Web based -GUI (IPv4 & IPv6), CLI, telnet server & client (IPv4 & IPv6) , TFTP client (IPv4 & IPv6), FTP client (IPv4 & IPv6), SFTP server, Zmodem, SNMPv1v2cv3, Syslog. sFlow, ICMPv6.		
47	b) RMONv1 & v2, LLDP, LLDP-MED, BooTP & DHCP client supporting both IPv4 & IPv6, DHCP relay option 82, DHCP relay option 60 & 61.		
48	c) Multiple images & configurations, SNTP, debug		
49	d) 802.3ah ethernet link OAM, 802.1ag CFM, Dying gasp.		
50	e) Inbuilt power saving technique on all Gigabit RJ-45 ports, IEEE 802.3az		
51	Secure Product Development Lifecycle Process Requirement Certification in accordance with IEC 62443-4-1: 2018 standard for cyber security capability		
52	All type of switches & transceivers should be from same make.		
53	All Core switches should be from same make.		

600 VA Offline UPS

Feature		**Technical Specification**	**Specification (Quoted / Applicable – by the bidder)**	**Complied (Yes / No)**
INPUT	Voltage	220/230 VAC		
	Voltage Range	140-300 VAC		
	Frequency Range	50 Hz		
OUTPUT	AC Voltage Regulation (Battery Mode)	±10%		
	Frequency Range (Battery Mode)	50 Hz ±1 Hz		
	Transfer Time	Typical 2-6 ms		

	Waveform (Battery Mode)	Simulated Sine Wave		
	Overload	110% +/-10% Shutdown after 5 minutes		
BATTERY	Battery Type & Number	12 V/7 Ah x 1		
	Typical Recharge Time	6-8 hours up to 90% capacity		
TRANSFER TIME	Minimum line break for transfer to battery	Typical 4-8 msec		
INDICATORS	AC Mode	Green lighting		
	Battery Mode	Green flashing		
	Fault	Red lighting		
ALARMS	Battery Mode, Low Battery, Overload, Battery replacement, fault	Audible alarm		
PROTECTION	Full Protection	Overload, discharge, and overcharge protection		
ENVIRONMENT	Operating Environment	0-40 Deg C.		
	Storage Temp	-15℃ to 50℃		
	Humidity	0-95 % RH @ 0-40°C (non-condensing)		
	Noise Level	Less than 40dB		
Test reports	BIS registration	Require		
	NABL Approved government lab test report.	Require		

3 KVA Online UPS `

Sl. No.	**Feature**	**Technical Specification**	**Specification (Quoted / Applicable – by the bidder)**	**Complied (Yes / No)**
1	Capacity	3kVA/2.4 kW.		
2	Design	True online double conversion design		
Input Characteristics.				

3	Nominal Input Voltage	230Vrms		
4	Nominal Input Frequency	50Hz.		
5	Input Power Factor	0.99		
6	Type of Rectifier	IGBT Based PWM Rectifier		
7	Input Voltage Range	110 VAC to 300 VAC		
8	Voltage Detection Tolerance ±3% Calibration	±3% Calibration		
9	Input Frequency Range	40-70Hz		
10	Inrush Limitation	7*IRMS_Nom		
11	Current Protection	With Fuse.		
Battery Parameters.				
12	Charging Method	Constant voltage constant current (CVCC)		
13	Charging current Capacity	Settable 1/2/4/6		
14	Type of Batteries	SMF VRLA, Li-ion, Tubular		
15	Back up time	2 Hours		
16	Minimum VAH required	4680		
17	Maximum Battery Leakage Current	500uA		
18	Charge Voltage Accuracy	±1%		
Output Parameters.				
19	Load power factor	0.8		
20	Nominal Output voltage	208/ 220/ 230/ 240 VAC Settable		
21	Output Frequency	Frequency Range (Battery Mode): 50Hz ± 0.1 Hz; Frequency Range (Synchronized Range): 46Hz ~ 54 Hz @ 50Hz system		
22	Output Waveform	Pure sine wave		
23	Total Harmonic distortion (THD)	Less than 3% for Linear Load and Less than 6% for RCD Load		
24	Inverter	IGBT based PWM with Instantaneous Sine wave control		
25	Power Rating	3kVA/2.4 kW.		
26	Dynamic response	IEC62040-3 Classification 1		
27	Crest factor	3:1		
28	Duty.	Continuous duty		
29	Overload Capacity	AC mode:105%~110%:		

		10min、110%~130%: 1min、>130% : 1sec ;		
30	Frequency synchronization Band for Static. Bypass	46 - 54Hz		
31	Transfer (Inverter to Bypass)	0 ms		
32	Retransfer (Bypass to Inverter)	0 ms		
33	Automatic Bypass	Inbuilt		
34	Overall efficiency (AC to AC)	90%.		
Miscellaneous Function				
35	Intelligent Fans Speed Control	Require		
36	Auto Restart Function	Require		
Physical and Environmental Characteristics.				
37	Acoustic Noise Level	Less than 58dB @ 1 Meter		
38	Ambient Temperature	0 - 50 Deg C		
39	Storage Temperature	-15°C~60°C		
40	Humidity	<95 % and non-condensing		
41	Altitude	<1000m		
42	Enclosure Protection Grade	IP 20		
43	Cooling	Forced Air		
Metering (Digital display)				
44	Input voltage	Advanced LCD based Display System, able to monitor Input Voltage/Battery Voltage/ Output Voltage / Output Frequency/ Input Frequency/ Ambient Temperature.		
45	Battery voltage			
46	Output voltage			
47	Output current			
48	Output frequency			
49	Input Frequency			
50	Heat sink temperature			
Fault indicated on Digital Display Alarms		LED indication display		
51	input fail	Inbuilt and accessible on LCD Display.		
52	Battery Low			
53	Transfer to bypass and system fault			
54	LED Indications			
55	Protection	Overload/ Short Circuit/ Battery Deep Discharge/ Low Battery/ Reverse Battery/ Inverter Current Limitation/ Over Temperature/ Output Overvoltage.		

56	Optional features	RS 232 communication port for interfacing, Remote monitoring		
Standards				
57	Low freq Conducted disturbance	IEC61000-2-2		
Other Standards				
58	Continuous Electromagnetic Susceptibility	IEC 61000-4-3		
59	Electrical Fast Transient Compatibility	IEC 61000-4-4		
60	Surge	EN 61000-4-5: 2005		
61	CRFI	IEC61000-4-6		
62	Magnetic Field Immunity	IEC 61000-4-8		
63	Transportation	IEC 60068-2-32,IEC 60068-2-64,IEC 60068.2-27		
64	Protection	IP-20		
65	NABL approved Government lab test certificate	Require		
66	ISO certifications	ISO 9001, ISO14001, ISO27001, ISO 45001:2018		
67	BIS registration	Require		
68	Make / Brand	Any globally reputed Manufacturer presence in India.		

UTM Firewall Hardware Device

Hardware Platform:	**Specification (Quoted / Applicable – by the bidder)**	**Complied (Yes / No)**
• No built-in mechanical moving parts.		
• Should be Hardened OS based firewall		
• Should have flash based configuration storage with NO built in HDD		
The firewall should 5 x 1GbE RJ45 connectors, 1000 Base-TX (10/100/1000Mbps). 2 USB 3.0, 1 RJ45 RS232 console port. Wireless Radio Type and Frequency Band, 2x2 802.11ax Wi-Fi 6 dual band radios, 2.4 GHz: Data rates up to 573 Mbps, 5 GHz: Date rates up to 1.2 Gbps		
• Memory/Flash : RAM: DDR4 4GB, eMMC 4GB Storage Power supply - Input Ratings: 100-240V AC, 0.9A Max, 50-60Hz. Output Ratings: 12V DC, 2.5A, Power Consumption - 25 Watts		
Following IP Address Assignment should be supported by the device:		

• Static		
• PPPoE Client		
• DHCP Client		
Firewall should support internal DHCP Server		
Firewall should be able to act as DHCP Relay Agent		
Performance:		
The firewall should support minimum 3.14 Gbps Gbps Firewall throughput		
The firewall should support minimum 403 Mbps UTM(fullscan) throughput		
The firewall should support minimum 1.02 Gbps VPN (UDP 1518) throughput		
The firewall should support minimum 472 Mbps GAV throughput		
The firewall should support minimum 525 Mbps IPS (fullscan) throughput		
The firewall should support minimum 1,300,000 concurrent sessions(Bidirectional)		
New session per second should me minimum 16,000		
Authentication servers/processes:		
Support for user authentication services such as Active Directory, LDAP, RADIUS, Secure ID, Digital certificates, Local user group authentications.		
Should Support Single-Sign-On Feature		
Should be able to support Terminal Services client / Citrix Client		
Networking:		
Firewall should support port independence		
Firewall should support Link Failover (Active - Active and Active - Passive)		
Firewall should be able to operate in Routing mode or Bridge (Transparent) mode		
Should support automatic WAN failover as well as load sharing for outbound traffic.		
Should be able to support VPN Failover		
Should support Server Load Balancing		
Firewall must support VLAN Tagging (IEEE 802.1Q)		
Should support Policy-Based Routing		
Firewall should support Dynamic Routing (RIP v1 & v2, OSPF & BGP)		
The Firewall must provide NAT functionality, including dynamic and static NAT translations.		
Firewall should be able to support Port Forwarding.		
Should have option to configure traffic shaping / QOS		
Compatible to Centralized Management		
The firewall must support Active-Active as well as Active-Passive redundancy.		
Actibve/Active as well as Active/Passive HA Clustering can be achieved		
The cluster should support simple and minimal downtime during upgrade		

Should have option to create ALIASES to identify group of Hosts or networks with one Unique Name		
Should have option to create Customized Aliases based on User/Group , Host IP/IP Range & Interface		
VPN function:		
The VPN should be integrated with firewall and support the full Encryption & other standards and protocols:		
(a) DES, 3DES, AES		
(b) MD5 and SHA-1 authentication		
(c) Diffie-Hellman Group 1, Group 2, Group 5 ,Group14, Group 15, Group 19 and Group 20		
(d) Internet Key Exchange (IKE) algorithm		
(f) The new encryption standard AES 128, 192 & 25 (Advanced Encryption Standard)		
Should support IPSec, PPTP, L2TP & SSL VPN		
Should support 75 Site-to-Site Tunnels (BOVPN)		
Should support minimum 75 Mobile VPN tunnels (IPSec, SSL, L2TP)		
Security:		
Should support Reputation based Cloud Security feature		
Denial of Service (DoS) attacks such as ping of death, syn flood, UDP bomb, Land attack, Smurf, Fraggle and ICMP unreachable		
Should support Auto Blocking of Source IP address based on triggers		
should support real time spam detection & also supports proactive virus detection technology which detects and blocks the new outbreaks immediately and accurately.		
The following actions should be supported for SMTP traffic		
• Tagging		
• Drop		
• Deny		
• Quarantine		
Should support of blocking attachments based of file names or extension		
Should support of blacklisting / whitelisting		
Should support Language independent anti-spam solution		
Advance Recurring Pattern Detection - anti-spam technology, that rely on RBL and scoring.		
Support for quarantine feature		
Web URL filtering with 100+ category based database, with option to refer Online or can be stored on Local Management Station		
Should be able to define specific URL's to be Allowed/Blocked		
Users should be able to allow blocked website using password override feature		
IPS and AV signature database keep on updating with hourly basis		
Should have a built-in Signature IPS engine on the same unit for IPS		

Should have Server/Client Quota based Distributed Denial of Service Prevention		
Should have the feature to exclude certain hosts' traffic (IP addresses) to be scanned by IPS for particular signatures		
Gateway AV should be supported for real-time detection of viruses and malicious code for HTTP, HTTPS, FTP, SMTP, POP3, SIP.		
Should have configurable policy options to select what traffic to scan for viruses		
Should support Application control for Web 2.0 applications		
Should not have inhouse security services for AV, IPS, Antispam		
Administration:		
Dedicated Application based GUI management program for robust configuration and management.		
Option for Remote management, through WEBUI, CLI & Secure Management Software		
Administrative TCP/IP ports should be other than TCP 80 and TCP 443 to prevent brute-force attack.		
Should support only single administrative login for integrity purpose and deny consecutive administrative login attempts		
Support for role based administration of firewall		
Configurable connection timeout for the management interface.		
Real-time network connection map for connection status.		
Drag-and-drop VPN configuration capability.		
Comprehensive reporting suite without any additional cost.		
Offline policy files configuration and modification.		
The Firewall must send SNMP traps to Network Management Servers (NMS) in response to System failures.		
Ability to make a full backup of the entire flash disk as image file.		
Ability to make/edit configuration file offline for better administrative management, without connecting to the operating security device.		
Should have option to Change Default Web UI Port		
Should have option to schedule rebooting		
Monitoring, Logging and Reporting		
Live Traffic Monitor		
Real-time reporting with Drill Down Feature		
System Services Status Monitor		
Authenticated User List Monitor		
VPN Connections Monitoring		
IP/Host/User based Traffic Watch with option Block Source/Destination from the monitoring tool itself		
Protocol based Traffic Watch		
PDF Audit Reporting		
Remote Logging Support		
Remote Reporting Support		
Remote Monitoring Support		
Encrypted Log Channel		

Provision to generate automatic alerts via mails / syslog		
The Firewall must send SNMP traps to Network Management Servers (NMS) in response to System failures.		
Multi-Appliance Log Aggregation		
Logging and reporting solution should be provided at no extra cost and shouldn't need any license renewal		
1 day of data (reports) retention should be provided at no extra cost on cloud		

49" DISPLAY

Sl. No	Section	Feature	Technical Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	Panel	Screen Size	49" or higher		
2		Panel Technology	IPS or VA		
3		Aspect Ratio	16:09		
4		Native Resolution	3,840 x 2,160 (UHD)		
5		Backlight Unit Type	Edge		
6		Brightness (cd/m2)	500nit or higher		
7		Dynamic Contrast Ratio	1,000,000:1 or higher		
8		Viewing Angle (H x V)	178 x 178 or higher		
9		Response Time	8ms(G to G) or better		
10		Surface Treatment (Haze)	Haze 28% or higher		
11		Operation Hours	24x7 Hrs		
12		Orientation	Landscape & Portrait		
13	Connectivity	Input	HDMI (3), DP, DVI-D, Audio, USB (2)		
14		Output	HDMI/DP, Audio		
15		External Control	RS232C In/out, RJ45 (LAN) In, IR In		
16	Specification	VESA	200 x 200 or as per OEM		
17	Key Feature	CPU-ARM Cortex-A53 1.1 GHz Quad, RAM-2GB DDR3-2133 (64bit), Memory- 16GB, GPU-ARM Mali-T820 MP2 (650MHz), Built-in Wi-Fi, Temperature Sensor, Auto Brightness sensor, Acceleration(Gyro) Sensor, Local Key Operation, Embedded CMS, USB Plug & Play, Fail over, Background Image, Sync Mode, Multi- screen (PIP, PBP (4)), Screen Share, Play via URL, Rotation (Screen Rotation, External Input Rotation), Gapless Playback, Tile Mode Setting (Max. 15 × 15), Setting Data Cloning, SNMP, Control Manager, 3rd Party Compatibility (Creston Connected), Power			

		(Smart Energy Saving, PM mode, Wake on LAN, Beacon, HDMI-CEC			
18	Environmental	Operation Temperature	0°C to 40°C		
19	Conditions	Operation Humidity	10% to 80%		
20	Power	Power Supply	100-240V~, 50/60Hz		
21		Power Type	Built-In Power		
22		Consumption: Smart Energy Saving / Max.	100W / 140W		
23	Software	Content Management Software	SuperSign CMS		
24	Compatibility	Control and Monitoring Software	SuperSign Control / Control+		
25	Certification	Safety	CB		
26		EMC	FCC Class "A" / CE / KC		
27		ErP / Energy Star	Yes / Yes		
28	Special Feature	Tilt (Facedown)	Max. 15°		
29		IP Rating	IP5x		

42U Floor Mount Standing Rack

Sl. No	Technical Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	19", 42U x 800mm width x 1000mm depth Floor Standing Networking Rack		
2	It should confirm to DIN 41494 or equivalent ISO standard		
3	It should be welded construction with steel frame		
4	Single Lockable tough end glass front door		
5	Vented dual metal door at the back, Vented side panels		
6	Powdered coated standard finish		
7	4 sets of casters wheel		
8	4 sets of adjustable levellers		
9	Horizontal Power Distribution Unit with 12 x 5/15A sockets Round Pin, 230 Volts AC, 32 Amp with Plug		
10	Horizontal Cable Manager		
11	Mounting Hardware set		
12	At least 4nos. Of FANs (360CFM) for cooling purpose		

27U Floor Mount Standing Rack

Sl. No	Technical Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	19", 27U x 800mm width x 800mm depth Floor Standing Networking Rack		
2	It should confirm to DIN 41494 or equivalent ISO standard		
3	It should be welded construction with steel frame		
4	Single Lockable tough end glass front door		
5	Vented dual metal door at the back, Vented side panels		
6	Powdered coated standard finish		
7	4 sets of casters wheel		
8	4 sets of adjustable levellers		
10	Horizontal Cable Manager		
11	Mounting Hardware set		
12	At least 2nos. Of FANs (180CFM) for cooling purpose		

24 Port LIU

Sl. No	Technical Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	24 Port Rack Mount LIU Fully Loaded with Single Mode LC Adapters and Pigtail (1 mtr)		
2	Aluminum & Cold Steel based material with powder coating for light mounting.		
3	Snap-in locker design, easy to change the adapter panels		
4	Should manage both splices and terminations		
5	Should have plastic Splice Tray capable of 24 fibers		
6	Should have 6 fiber magic sticker provision inside for 900um tight buffered fiber storing		
7	Accessory kit consists of cable ties, mounting ear screw		
8	Front-Mounted Cable Saddles for jumper management		
9	Removable Top & Front cover for better access to interior of LIU		
10	Rubber grommet allow for pre-terminated fiber trunk installation, protects cable and minimizes dust build-up		
11	Adapter panel - Cold steel		
12	Adapters should have compact design & high precision		
13	which perform well under various circumstances & maintain good plug retention strength.		
14	All fiber items should be from same make.		

15	Make / Brand: Any globally reputed Manufacturer presence in India.			
1Gbps FO Transceiver				
Sl. No	**Technical Specification**			
1	1 Gbps Single Mode Fibre Optic Transceiver (For Core Switch)			
2	1000BASE-LX Single Mode SFP Transceiver with Duplex LC Connector			
3	Support IEEE 802.3z standard			
4	At least 10Km distance support on single mode fiber interface			
5	Transceiver module should be hot pluggable. MSA Compliant			
6	TTL signal detect indicator, Metal enclosure for lower EMI			
7	Operating wavelength: 1310nm			
8	It should be of same make as Core Switches			
9	Secure Product Development Lifecycle Process Requirement Certification in accordance with IEC 62443-4-1: 2018 standard for cyber security capability			
10	All type of switches & transceivers should be from same make.			
11	All Core switches should be from same make.			
12	Make / Brand: Any globally reputed Manufacturer presence in India.			
10Gbps FO Transceiver				
Sl. No	**Technical Specification**		**Specification (Quoted / Applicable – by the bidder)**	**Complied (Yes / No)**
1	10 Gbps Single Mode Fiber Optic Transceiver			
2	10GBASE-LR Single Mode SFP+ Transceiver with Duplex LC Connector			
3	Support IEEE 802.3ae standard			
4	At least 10Km distance support on single mode fiber interface			
5	Transceiver module should be hot pluggable. MSA Compliant			
6	Operating wavelength: 1310nm			
7	Secure Product Development Lifecycle Process Requirement Certification in accordance with IEC 62443-4-1: 2018 standard for cyber security capability			
8	All type of switches & transceivers should be from same make.			
9	All Core switches should be from same make.			
	Make / Brand	Any globally reputed Manufacturer presence in India.		

LC-LC Fibre Optic Patch Cord

Sl. No	Technical Specification		Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	LC - LC SM FO Duplex Patch Cord 5 Meter Length			
	The optical fiber patch cords shall comply with the following specifications:			
2	Optical Fiber – Single mode - OS1			
3	Connector: Zirconia ceramic ferrule			
4	Pre-radiuses and pre-polished ferrule			
5	Duplex Type			
6	Color-coded Yellow for Single mode			
7	Insertion Loss : <0.3 db			
8	Cable: 9/125, SM			
9	Return Loss: >/= 50dB for UPC			
10	Durability: 1000 mating cycle			
11	Working Temp: (0 deg. C to 60 deg. C)			
12	Length: 5 Meter			
13	All fiber items should be from same make.			
14	Make / Brand	Any globally reputed Manufacturer presence in India.		
	LC-LC Fibre Optic Patch Cord			

Sl. No	Technical Specification		Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	LC - LC SM FO Duplex Patch Cord 2 Meter Length			
	The optical fiber patch cords shall comply with the following specifications			
2	Optical Fiber – Single mode - OS1			
3	Connector: Zirconia ceramic ferrule			
4	Pre-radiuses and pre-polished ferrule			
5	Duplex Type			
6	Color-coded yellow for Single mode			
7	Insertion Loss : <0.3 db			
8	Cable: 9/125, SM			
9	Return Loss: >/= 50dB for UPC			
10	Durability: 1000 mating cycle			
11	Working Temp: (- 10 deg. C to + 60 deg. C)			
12	Length: 2 Meter			
13	All fiber items should be from same make.			
14	Make / Brand	Any globally reputed		

		Manufacturer presence in India.		

UTP CAT-6 Outdoor Cable		

Sl. No	**Technical Specification**		**Specification (Quoted / Applicable – by the bidder)**	**Complied (Yes / No)**
1	Category 6 Outdoor cable shall be compliant with ANSI/TIA/EIA-568-C.2 & and ISO/IEC 11801 channel performance up to 85 mtr.			
2	Category 6 Outdoor cable shall be capable of enhanced performance for transmission of high-speed data, digital and analogue voice and video (RGB) signals on LANs.			
3	All Category 6 Outdoor cables shall meet or exceed the following characteristics:			
4	Construction: 4 twisted pairs separated by internal X shaped, 4 channel, full separator. Half shall not be accepted.			
5	Category 6 Outdoor cable shall be UV Resistant			
6	Conductor dia: 23 AWG			
7	Insulation: Polyethylene			
8	Insulation Diameter: 1.04 ± 0.05 mm			
9	Sheath Thickness: 0.5 ± 0.15 mm			
10	Pairing: Two insulated conductor twisted together			
11	No. of Pair: 4 pair separated by a separator			
12	Sequential meter marking should be available			
13	Color of Jacket: Black			
14	Outer Jacket: PE			
15	Inner Jacket: PVC			
16	Filler : Central Slit Film Cross Filler			
17	Outer Diameter: 7.1 mm			
18	BEND RADIUS: 8 X CABLE DIAMETER			
19	Thickness of Inner Jacket: 0.45 mm ± 0.05 mm			
20	Thickness of Outer Jacket : 0.55 mm ± 0.05 mm			
21	Electrical Parameters			
22	CONDUCTOR RESISTANCE (DC): 9.38Ω ohms /100mtr@20˚C. MAX.			
23	RESISTANCE UNBALANCE: 5%MAX			
24	MUTUAL CAPACITANCE: 5.6 nF/100 mtrs MAX.			
25	CAPACITANCE UNBALANCE PAIR/GROUND: 330pF/100M MAX			
26	DELAY SKEW: ≤45 nS/100M			
27	NORMAL VELOCITY OF PROPAGATION: 69%			
28	IMPEDANCE: 100 ± 15% Ω			
29	Temperature Rating: (- 20 to +60 C)			
30	Packing : 305 Mtrs.			
31	Generally confirming to EIA/TIA 568-C.2 and IEC/ISO 11801			
32	All Network Cable should be from same make.			
33	Make / Brand	Any globally reputed Manufacturer presence in India.		

6 Core SM 9/125 Outdoor Fibre Optic Armoured Cable		

Sl. No	Technical Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	6 Core Single Mode Outdoor Armored Fiber Optic Cable		
2	Electro Chromium Coated Corrugated Steel Tape (ECCS)		
3	Central loose tube with jelly compound		
4	Sequential meter marking		
5	Armoured Design with Steel music Wire		
6	Outer Diameter: 7.2±0.5mm (for 6 Core Cable)		
7	Thickness of HDPE Jacket: 1.8±0.2mm		
8	Pulling Tension: Short Term (1000N)		
9	Crush Load: 2000N/100mm		
10	Bend Radius: Short Term (20D)		
11	The fiber type is a Matched Cladding Single Mode		
12	The fiber is optimized for operation at 1310 nm and at 1550 nm.		
13	Nominal Mode Field Diameter: 9.3 µm		
14	Cladding Diameter: 125 µm		
15	PMD (ps/km): ≤ 0.2		
16	Cable Cut-off Wavelength: 1260nm		
17	**Attenuation (of cable with fibers):**		
	At 1310 nm: 0.34 dB/km		
	At 1550 nm : 0.24 dB/km		
18	Operating Temperature should be within -20°C to +60°C		
19	Make / Brand: Any globally reputed Manufacturer presence in India.		

12 Core SM 9/125 Outdoor Fibre Optic Armoured Cable			
Sl. No	**Technical Specification**	**Specification (Quoted / Applicable – by the bidder)**	**Complied (Yes / No)**
1	12 Core Single Mode Outdoor Armored Fiber Optic Cable.		
2	Corrugated steel tape armoured		
3	Central loose tube with jelly compound		
4	Glass Yarns between steel tape & loose tube		
5	Sequencial meter marking		
6	The fiber should fulfill the requirement of ITU-T REC G.652D		
7	Outer Diameter: 9 ± 0.3mm (for 12 Core Cable)		
8	Thickness of HDPE Jacket: 1.8±0.2mm		
9	Pulling Tension: Short Term (2000N)		
10	Crush Load: 3000N/100mm		
11	Bend Radius: (20D)		
12	The fiber type is a Matched Cladding Single Mode		
13	The fiber is optimized for operation at 1310 nm and at 1550 nm.		
14	Nominal Mode Field Diameter: 9.2 µm		
15	Cladding Diameter: 125 µm		

16	PMD (ps/km): 0.2			
17	Cable Cut-off Wavelength: <= 1260nm			
18	Attenuation (of cable with fibers):			
	At 1310 nm: 0.36 dB/km			
	At 1550 nm : 0.22 dB/km			
19	Make / Brand	Any globally reputed Manufacturer presence in India.		

24 Core SM 9/125 Outdoor Fibre Optic Armoured Cable

Sl. No	Technical Specification		Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	24 Core Single Mode Outdoor Armoured Fiber Optic Cable.			
2	Corrugated steel tape armoured			
3	Central loose tube with jelly compound			
4	Glass Yarns between steel tape & loose tube			
5	Sequential meter marking			
6	The fiber should fulfill the requirement of ITU-T REC G.652D			
7	Outer Diameter: 9.5 ± 0.3mm (for 24 Core Cable)			
8	Thickness of HDPE Jacket: 1.8±0.2mm			
9	Pulling Tension: Short Term (2000N)			
10	Crush Load: 3000N/100mm			
11	Bend Radius: (20D)			
12	The fiber type is a Matched Cladding Single Mode			
13	The fiber is optimized for operation at 1310 nm and at 1550 nm.			
14	Nominal Mode Field Diameter: 9.2 µm			
15	Cladding Diameter: 125 µm			
16	PMD (ps/km): 0.2			
17	Cable Cut-off Wavelength: <= 1260nm			
18	**Attenuation (of cable with fibers):**			
	At 1310 nm: 0.36 dB/km			
	At 1550 nm : 0.22 dB/km			
19	Make / Brand	Any globally reputed Manufacturer presence in India.		

Outdoor Weatherproof Customized Rack				
Sl. No	**Feature**	**Technical Specification**	**Specification (Quoted / Applicable – by the bidder)**	**Complied (Yes / No)**
1	Metal Guage	18 SWG or Better		
2	Colour	Off White / Gray / Cream		
3	Colour Coating	Powder Coated		
4	Dimension	As Per Requirement (Weather Proof Design with cooling arrangement)		
	(W X H X D)			
5	Lock Facility	Double Lock facility		
Double Door DB Box				

Sl. No	**Feature**	**Technical Specification**	**Specification (Quoted / Applicable – by the bidder)**	**Complied (Yes / No)**
1	Type	8 Way SPN MCB DB		
2	Enclosure	Double Door with IP42/43 protection		
3	Isolator	1 No. 32 Amp Double Pole (Loaded)		
4	MCB	6 Nos. 10 Amp / 6 Amp Single Pole (loaded)		
5	Supply	Single Phase 250V AC		
6	Brand / Make	Any globally reputed Manufacturer presence in India.		

- Bidder should submit all relevant data sheet/brochure of all quoted items and should also availablein respective OEM's official website.
- Bidder should indicate items mentioned in the OEM data sheet / brochure by marketing as mentioned in minimum specification in the RFP

Authorized Signatory (Signature In full): _____

Name and title of Signatory: _____

Stamp of the Company: _____