

**PROCUREMENT OF IT HW FOR SIG UNIT/SUB UNIT FOR IMPL OF EXTENSION OF
ADN AND LAN OUT OF IT GRANT FOR FY 2024-25**

1. **Schedule of requirements.** List of items / services required is as follows:-

Ser No	Items	A/U	Qty	GeM Avbl/Non Avbl	Remarks
1.	HDMI Ethernet Extender 120 mtr	Pair	03	Yes	
2.	Media converter(OTE)	Pair	04	Yes	
3.	OTE Aggregator (14 device)	Nos	02	No	
4.	08 Port Switch	Nos	05	No	
5.	UTP cable CAT6	Roll	15	Yes	
6.	UPS 1 KVA	Nos	10	Yes	
7.	NAS 6TB	Nos	04	No	
8.	OFC	Mtr	5000	Yes	
9.	HDMI cable 20 mtr	Nos	10	Yes	
10.	HDMI cable 10 mtr	Nos	10	Yes	
11.	HDMI cable 05 mtr	Nos	10	Yes	
12.	USB to Ethernet	Nos	05	Yes	
13.	USB Extender 3.0 (15 mtr)	Nos	05	No	
14.	Patch Panels 24 Ports	Nos	01	No	
15.	UTP CAT6 Patch Cord (5 mtr)	Nos	10	Yes	
16.	04 Port POE switch	Nos	10	Yes	
17.	HDMI Switcher 4 x 4	Nos	2	No	
18.	E2K to E2K (SM Duplex) OFC Patch cord 10 mtr	Nos	10	No	
19.	Network Aggregator	Nos	1	No	
20.	Load Balancer	Nos	1	No	

2. **Technical Specification.** Specifications are as follows:-

Ser No	Nomenclature	Qualitative Requirement/ Parameter	Compliance (Yes/ No)	Make/ Model	Deviation/ Remarks
1.	HDMI Ethernet Extender				
	Video and Audio				
	Supported Resolutions	Up to 4K @ 60Hz (3840 x 2160) / 1080p @ 60Hz (1920 x 1080)			
	Video Bandwidth	18 Gbps (for 4K @ 60Hz)			
	HDMI Standard	HDMI 2.0b, HDCP 2.2			
	Audio Formats	LPCM, DTS-HD, Dolby TrueHD, 7.1 surround sound			
	Transmission Distance				
	Max Distance	Min 120m (394 ft) using Cat6/6a/7 cable			
	Ethernet Cable Requirements	Cat5e/Cat6/Cat7 cable for optimal performance			
	Connectivity				
	Input	1 x HDMI Type-A (Male to Male)			
	Output	1 x HDMI Type-A (Male to Male)			
	Features				
	IR Pass-Through	Supports IR remote control extension			
	EDID Management	Built-in EDID management for device compatibility			
	Latency	Near-zero latency for real-time video transmission			
	Compression Technology				
	Signal Compression	Visually lossless video compression			
	Power				
	Power Supply	5V or 12V DC power adapter			
	Power Consumption	≤10W for both transmitter and receiver			
	Construction				
	Material	Metal enclosure for durability and heat dissipation			
	Operating Temperature	0°C to 50°C (32°F to 122°F)			
	Compliance and Standards				
	Certifications	CE, FCC, RoHS compliant			
	Compatibility	Works with Blu-ray, PCs, laptops, set-top boxes			
2.	Media Converter (Optical to Ethernet)				
	Optical Port				
	Type	1 x SC/LC connector (depending on model)			
	Fiber Type	Single-mode or Multi-mode fiber			
	Wavelength	1310nm / 1550nm			
	Transmission Distance	Up to 20km (single-mode) / 2km (multi-mode)			

Ser No	Nomenclature	Qualitative Requirement/ Parameter	Compliance (Yes/ No)	Make/ Model	Deviation/ Remarks
	Ethernet Port				
	Speed	10/100/1000 Mbps RJ45 Ethernet			
	Duplex	Full-duplex or Half-duplex (auto-negotiation)			
	Auto MDI/MDIX	Supported for automatic crossover detection			
	Supported Standards				
	Ethernet Standards	IEEE 802.3, IEEE 802.3u, IEEE 802.3ab, IEEE 802.3z			
	Fiber Standards	IEEE 802.3z (for gigabit fiber connectivity)			
	Power				
	Power Input	External power adapter (5V DC, 1A or 12V DC, depending on model)			
	Power Consumption	≤5W			
	LED Indicators				
	Status LEDs	Power, Link/Activity, Speed, Fiber Link Status			
	Environmental Specifications				
	Operating Temperature	0°C to 50°C (32°F to 122°F)			
	Storage Temperature	-20°C to 70°C (-4°F to 158°F)			
	Operating Humidity	10% to 90% non-condensing			
	Compliance and Certifications				
	Certifications	CE, FCC, RoHS compliant			
3.	OTE Aggregator (14 device)				
	Chassis Capacity				
	Number of Slots	Minimum 14			
	Supported Modules	Media converter modules (fiber-to-copper, fiber-to-fiber, etc.)			
	Modular Design	Hot-swappable media converter modules			
	Supported Media Converters				
	Fiber Type	Supports both Single-mode and Multi-mode fiber converters			
	Ethernet Standards	IEEE 802.3, IEEE 802.3u, IEEE 802.3ab, IEEE 802.3z			
	Fiber Standards	IEEE 802.3z (Gigabit fiber), Fast Ethernet (100Base-FX)			
	Converter Types	Copper-to-fiber, fiber-to-fiber, copper-to-copper			
	Data Rates	Supports 10/100/1000 Mbps modules			
	Power				
	Power Supply	Dual redundant hot-swappable power supplies			

Ser No	Nomenclature	Qualitative Requirement/ Parameter	Compliance (Yes/ No)	Make/ Model	Deviation/ Remarks
	Power Input	AC: 100-240V, 50/60Hz			
	Power Consumption	≤100W (depends on the number of loaded modules)			
	Cooling System				
	Cooling Type	Built-in fans for active cooling			
	Fan Redundancy	Dual fan system with automatic failure detection			
	LED Indicators				
	Status LEDs	Power, Fan, Link/Activity, Slot Status			
	Management and Monitoring				
	Management Interface	SNMP v1/v2c/v3, Web-based management			
	Monitoring Features	Real-time link monitoring, port statistics, error reporting			
	Alarm System	Audible and visual alarms for power, temperature, and fan failures			
	Environmental Specifications				
	Operating Temperature	0°C to 50°C (32°F to 122°F)			
	Storage Temperature	-20°C to 70°C (-4°F to 158°F)			
	Humidity	10% to 90% non-condensing			
	Included Items	Chassis, power cords, rackmount brackets, user manual			
4.	8 Port POE Switch				
	Number of PoE Ports	8 x 10/100/1000 Mbps RJ45 Ports (PoE)			
	Number of Uplink Ports	2 x Gigabit Uplink Ports (RJ45 or SFP)			
	PoE Standards Supported	IEEE 802.3af (PoE), IEEE 802.3at (PoE+)			
	PoE Power Budget	Up to 150W total PoE budget			
	Maximum Power per Port	Up to 30W per port (PoE+)			
	Switching Capacity				
	Bandwidth	20 Gbps switching capacity			
	Forwarding Rate	14.88 Mpps (Million packets per second)			
	Network Standards				
	Ethernet Standards	IEEE 802.3, IEEE 802.3u, IEEE 802.3ab, IEEE 802.3x			
	VLAN Support	Supports IEEE 802.1Q VLAN Tagging			
	Link Aggregation	Supports IEEE 802.3ad Link Aggregation Control Protocol (LACP)			

Ser No	Nomenclature	Qualitative Requirement/ Parameter	Compliance (Yes/ No)	Make/ Model	Deviation/ Remarks
	Power				
	Power Supply	Built-in AC power supply (100-240V, 50/60Hz)			
	Power Consumption	≤180W			
	Management Features				
	Management Type	Web-based GUI, SNMP v1/v2c/v3, CLI			
	PoE Scheduling	Allows scheduling of PoE ports to power on/off			
	Monitoring	Real-time port monitoring, traffic statistics, PoE status			
	Environmental Specifications				
	Operating Temperature	0°C to 40°C (32°F to 104°F)			
	Storage Temperature	-40°C to 70°C (-40°F to 158°F)			
5.	UTP Cable Cat 6				
	Conductor	Solid bare electrolytic grade copper : 23AWG			
	Insulation	Polyethylene			
	Jacket	PVC inner jacket and PE outer jacket			
	Temperature rating	-20°C to + 60°C			
	Marking	Sequential marking at every meter			
	Armoring	Aluminum wire			
	Filler	HDPE			
	Resistance unbalance	5% max			
	Capacitance unbalance	330pF/100m			
	Delay skew	<45nS			
	Impedance	100 ohms ± 15			
6.	HDMI Cable 20 mtr				
	Connector Type	HDMI 13.9 mm × 4.45 mm A Male to A Male			
	Type	Gold plated connector			
	ARC	Yes			
	Length	20			
	Version	Optical Fiber Based			
	Resolution	480p, 720p, 1080i and 1080p			
7.	HDMI Cable 10 mtr				
	Connector Type	HDMI 13.9 mm × 4.45 mm A Male to A Male			
	Type	Gold plated connector			
	ARC	Yes			
	Length	10 mtr			
	Version	Optical Fiber Based			
	Resolution	480p, 720p, 1080i and 1080p			
8.	HDMI Cable 5 mtr				
	Connector Type	HDMI 13.9 mm × 4.45 mm A Male to A Male			
	Type	Gold plated connector			
	ARC	Yes			
	Length	5 mtr			
	Version	Copper Based			
	Resolution	480p, 720p, 1080i and 1080p			

Ser No	Nomenclature	Qualitative Requirement/ Parameter	Compliance (Yes/ No)	Make/ Model	Deviation/ Remarks
9.	UPS 1 KVA				
	Power Factor	0.6VA			
	Capacity	1000VA			
	Input Voltage	200-245V AC			
	Input Frequency	50/60Hz			
	Output				
	Voltage	230V AC			
	Waveform	Simulated Sine Wave			
	No of PC Supported	2 or more			
	Transfer Time	4-8 ms			
	Outlet	Min 3 sockets			
	Certifications	ISO9001, ISO14001, BIS & ROHS			
	Temperature	Operating – 0~45 deg, Storage - -10~55 deg			
	Humidity	0~95%RH Non Condensing			
	Outlet	Min 3 sockets			
	Certifications	ISO9001, ISO14001, BIS & ROHS			
Temperature	Operating – 0~45 deg, Storage - -10~55 deg				
Humidity	0~95%RH Non Condensing				
10.	NAS 4 TB				
	Capacity	4 TB			
	Connector	USB-A 3.0 Ethernet RJ45 Gigabit Power Supply			
	Features	One central place to store everything Automatically backup your files Organize and easily find Anywhere Access Share and Collaborate Individual, private spaces for each user Plays well with others			
	Compatibility	Windows® 10+			
	Status LEDs	Unit: power Network port: Link, activity, speed			
	Environmental Specifications	Operating temperature: 5° to 35° Operating humidity: 90% maximum relative humidity, non-condensing Storage temperature: -20° to 65°			
11.	OFC 6 Core				
	Number of cores	6			
	Operating temperature	-20°C to +60°C			
	Jacket material	PVC, HDPE, or LSZH			
	Fiber type	Single mode OS1			
	Cable length	In drums/rolls			
	Outer diameter	5.3 mm or more			

Ser No	Nomenclature	Qualitative Requirement/ Parameter	Compliance (Yes/ No)	Make/ Model	Deviation/ Remarks
	Bend radius	20D short term, 10D long term			
	Jacket thickness	1.8 mm or more			
	Operational wavelength	1310–1550 nanometers			
	Stability Strands	FRP + Yarn + Strands Iron			
	Function	For outdoor hanging			
12.	USB to Ethernet Converter				
	Device Interfaces	USB Type A Connector			
	Standards	USB Specification Version 3.0, USB Specification Version 2.0			
	Minimum System Requirements	Operating system: Microsoft Windows 11/10/8/7/Vista/XP SP3			
	Network Interface	Ethernet (RJ45)			
13.	USB Extender 3.0 (15 mtr)				
	Type Start	USB type A Male			
	Type End	USB type A Female			
	Length	Minimum 15 mtr			
	Housing	Plastic Braided			
	Compatible	USB Type 1.0, 2.0			
	Plug & Play	Yes			
	Powered	No			
	Data Rate	Upto 5GBPS			
	Operating Temperature	0°C to 40°C (32°F to 104°F)			
	Storage Temperature	-40°C to 70°C (-40°F to 158°F)			
14.	Patch Panel 24 port				
	Identification	ID plate, PVC, Transparent color with paper			
	Panel	SPCC, 1.5mm thickness with Black (RAL 9005) color painted			
	Housing	ABS, UL 94V-0			
	Contact Brackets	PC, UL 94V-2, Transparent color			
	Material	Phosphor Bronze with Nickel Plated			
	Finish	50 micro-inches Gold plated on plug contact area			
	Housing	PC+ Glass Fiber, UL 94V-2			
	Terminal	phosphor Bronze with Tin plated			
	Jack Bracket Set	ABS, UL 94V-0			
	PCB	FR4, UL 94V-0			
	Fully Loaded	Yes			
	Ventilation	Yes			
15.	UTP Patch Cord 5 mtr				
	Length	5 mtr			
	Conductor	Solid bare electrolytic grade copper : 23AWG			
	Insulation	Polyethylene			
	Jacket	PVC inner jacket and PE outer jacket			
	Temperature rating	-20°C to + 60°C			

Ser No	Nomenclature	Qualitative Requirement/ Parameter	Compliance (Yes/ No)	Make/ Model	Deviation/ Remarks
	Marking	Sequential marking at every meter			
	Armoring	Aluminum wire			
	Filler	HDPE			
	Resistance unbalance	5% max			
	Capacitance unbalance	330pF/100m			
16.	04 port POE Switch				
	Number of PoE Ports	4 x 10/100/1000 Mbps RJ45 Ports (PoE)			
	Number of Uplink Ports	1 x Gigabit Uplink Ports (RJ45 or SFP)			
	PoE Standards Supported	IEEE 802.3af (PoE), IEEE 802.3at (PoE+)			
	PoE Power Budget	Up to 100W total PoE budget			
	Maximum Power per Port	Up to 30W per port (PoE+)			
	Switching Capacity				
	Bandwidth	20 Gbps switching capacity			
	Forwarding Rate	14.88 Mpps (Million packets per second)			
	Network Standards				
	Ethernet Standards	IEEE 802.3, IEEE 802.3u, IEEE 802.3ab, IEEE 802.3x			
	VLAN Support	Supports IEEE 802.1Q VLAN Tagging			
	Link Aggregation	Supports IEEE 802.3ad Link Aggregation Control Protocol (LACP)			
	Power				
	Power Supply	Built-in AC power supply (100-240V, 50/60Hz)			
	Power Consumption	≤180W			
	Management Features				
	Management Type	Web-based GUI, SNMP v1/v2c/v3, CLI			
	PoE Scheduling	Allows scheduling of PoE ports to power on/off			
	Monitoring	Real-time port monitoring, traffic statistics, PoE status			
	Environmental Specifications				
	Operating Temperature	0°C to 40°C (32°F to 104°F)			
	Storage Temperature	-40°C to 70°C (-40°F to 158°F)			
17.	E2K to LCK (SM Duplex) OFC Patch cord 10 mtr				
	Connector Type	E2K to LCK	Yes		
	Fiber Grade	(G 657 A1) (Compatible with G.652.D)	Yes		
	Wavelength	1310/1550nm	Yes		
	Insertion Loss	≤ 0.3 dB	Yes		
	Return Loss	≥50dB	Yes		
	Bend Radius	Fiber core 15 mm min	Yes		
	Bend Radius	Fiber cable 25D/5D min(dynamic/static)	Yes		
	OFC Patch Cord	10 meter	Yes		

Ser No	Nomenclature	Qualitative Requirement/ Parameter	Compliance (Yes/ No)	Make/ Model	Deviation/ Remarks
18.	HDMI Switcher 4 x 4				
	Audio	Yes			
	AV Input	HDMI			
	AV output	HDMI			
	Ports	4 or more			
	Rack Mountable	Yes			
	Bandwidth	18 Gbps			
	Wide Screen Support	Yes			
	Connector A	4 x HDMI Female			
	Connector B	4 x HDMI Female			
	Led Indicator	Power, Active port			
	Input Current	Max 1.5 A			
	Input Voltage	230 V AC			
	Power Source	Adaptor included			
	Humidity	20-90%			
	Op Temp	0 to 40 deg C			
	Storage Temp	-20 to 60 deg C			
Certifications	CE, FCC, RoHS compliant				
19.	Network Aggregator				
	Chassis Capacity				
	Number of Fixed WAN ports	2			
	No of Fixed LAN ports	6			
	No of WAN ports	4			
	WAN Port Rate	1 x 10/100/1000 BASE-T Ports			
	No of LAN/WAN Ports	3			
	LAN Port Rate	9 x 10/100/1000 Base T Ports			
	No of 10/100/1000 Base -T Ports	10			
	Total No of RJ45 ports	10			
	Flash memory	256 MB			
	SDRAM	512MB			
	CPU	1.35GHz *2			
	Mounting	1 U Rack type			
	LEDs	Sys, Per RJ45 ports			
	Reset Buttons	Yes			
	Cooling	Natural Cooling			
	Operating Humidity	10-90% (Non Condensing)			
	Storage Humidity	5-95% (Non Condensing)			
	Port Surge Protection	+4KV			
	Max Power Consumption	<25W			
	Internet Connection Type	PPPoE, DHCP, Static IP			
	Throughput	1500Mbps			
	PPPoE Client	Yes			
	PPPoE Server	Yes			
	PPPoE Concurrent Connection	128			

Ser No	Nomenclature	Qualitative Requirement/ Parameter	Compliance (Yes/ No)	Make/ Model	Deviation/ Remarks
	Max no of VLANs	Yes			
	VLAN Priority	Yes			
	No of IPSEC VPN Tunnel	64			
20	Load Balancer				
	Standards and Protocols	IEEE 802.3, 802.3u, 802.3ab, IEEE 802.3x, IEEE 802.1q TCP/IP, DHCP, ICMP, NAT, PPPoE, NTP, HTTP, HTTPS, DNS, IPsec, PPTP, L2TP, OpenVPN, SNMP			
	Flash	128 MB			
	Performance	Concurrent Session – 150,000, New Sessions /Second – 2,600			
	NAT (Static/Dynamic IP)	Upload: 945.77 Mbps Download: 945.56 Mbps Bi-Directional: 1808.29 Mbps			
	NAT (L2TP)	Upload: 845.64 Mbps Download: 802.65 Mbps Bi-Directional: 931.96 Mbps			
	IPsec VPN Throughput	ESP-MD5-AES256: 171.26 Mbps ESP-SHA1-AES256: 224.86 Mbps ESP-SHA2-AES256: 248.04 Mbps			
	L2TP VPN Throughput	Unencrypted: 864.65 Mbps Encrypted: 47.11 Mbps			
	WAN Connection Type	Static/Dynamic IP PPPoE, PPTP, L2TP, Mobile Broadband: 4G/3G modem for backup via USB port			
	MAC Clone	Modify WAN/LAN MAC Address			
	DHCP	DHCP Server/Client DHCP Address Reservation Multi-net DHCP* Multi-IP Interfaces*			
	IPv6	Static IP / SLAAC / DHCPv6 / PPPoE / 6to4Tunnel / Pass Through			
	VLAN	802.1Q VLAN			
	Advanced Routing	Static Routing, Policy Routing			
	Load Balance	Intelligent Load Balance Application Optimized Routing Link Backup (Timing\$, Failover) Online Detection			
	Security	SPI Firewall VPN Pass through FTP/H.323/PPTP/SIP/IPsec ALG, DoS Defence, Ping of Death Local Management			
	Session Limit	IP-based Session Limit			
	IP-based Session Limit	Source/Destination IP Based Access Control			
	Management Features	Automatic Device Discovery Intelligent Network Monitoring Abnormal Event Warnings Unified Configuration Reboot Schedule Captive Portal Configuration			

Ser No	Nomenclature	Qualitative Requirement/ Parameter	Compliance (Yes/ No)	Make/ Model	Deviation/ Remarks
	Certification	CE, FCC, RoHS			
	Environment	Operating Temperature: 0–40 °C (32–104 °F); Storage Temperature: -40–70 °C (-40–158 °F) Operating Humidity: 10–90% RH non-condensing Storage Humidity: 5–90% RH non-condensing			