Section-v

Technical Specification for CCTV Surveillance system

Bill of Quantity

Sl. No.	Particulars	Qty
1.	Outdoor Call Unit	01 No.
2.	Master Control Unit	01 No.
3.	Emergency Help Tower	01 No.
4.	30X Day/Night 60fps full HD PTZ IP Camera	01 No.
5.	5 MP Day & Night auto focus IR Bullet IP Camera	01 No.
6.	5 MP Day & Night auto focus IR Vandal Resistant Dome IP Camera	01 No.
7.	POE 8 port Switch	01 No.
8.	UTP Cat6e 500 Mhz Cable (305Mtr Drum Box)	01 Box
9.	IP 55 6 U Rack with all accessories	01 No.
10.	Horn speaker with inbuilt Amplifier compatible with Control & Call Unit.	01 No.
11.	SM OFC Patch Cord SC to LC type (3 Mtr)	01 No.
12.	12 Port Loaded LIU Rack mount fully loaded	01 No.
13.	SM 6 core armored Fiber cable (per meter)	01Mtr.
14.	SM Media Converter 10/100/1000	01 No.
15.	40 mm HDPE PLB pipe (per meter)	01 Mtr.
16.	Underground OFC laying in HDPE pipe in 3 feet depth	01 Mtr
17.	1.5 mm Armored Power Cable (per meter)	01 Mtr.
18.	IP camera Poll	01 No.
19.	Civil Construction & Fabrication for Emergency Help Tower	01 No.
20.	Per Camera Installations Charge.	Per Camera

Scope of Work :

- General requirements of Surveillance Camera System Supply, installation, testing and commissioning of security camera system CIP Area and others area as per the scope and terms below :
- The system hardware should be independent of any severer software for 24/7 surveillance, PA, Paging, and 2-way audio-video communication.
- The system should be PoE powered IP device or 24VDC power with2way audio-video function .
- The system should have2 channels, one for surveillance, and another for communication.
- The system hardware should have HD camera inbuilt in it for 24/7 surveillance as well as Emergency video communication .
- The system hardware should have inbuilt PA and paging functionality for all devices.
- The system hardware should be able to do self-connectivity check with status reporting .
- The system hardware should be able to do self-functionality check for inbuilt-speaker and microphone with status reporting.
- The system hardware should be compatible with IP-PABX system at both ends without any 3rd party intermediary software or hardware.
- The system hardware should be able to send emails based on predefined variables without any 3rd party intermediary software or hardware.
- The system hardware should be able to predefine calls as Normal, Priority, Urgent and set preference accordingly for overriding the established communication.
- The system hardware should have a provision to add as many relay inputs or outputs in order to Integrate with 3rdparty hardware.

Technical Specification

Item No. 1 : Outdoor Call Unit

Parameter	Minimum Specification
IP rating	IP65
Mechanical impact resistance	IK08
Front panel	stainless steel, 3 mm
Microphone	2 x digital MEMS microphones
Loudspeaker	Special membrane type for optimal sound quality
Amplifier	integrated class-D amplifier with 2.5 W
Sound pressure level	Max. 92 dB
Call indication	3 x multifunction LED (multi-colored)
Call button	Four backlit call button expandable upto 6
Audio transmission bandwidth	68 KBPS minimum
Audio Video transmission bandwidth	192 KBPS minimum
Type of Communication	Hands Free
Codecs	Audio: G.722, G.711 a-law and G.711 u-law; Video: H.264 (SIP video)
Operating temperature range	–40 °C to +65 °C (–40 °F to +149 °F)
Storage temperature range	–40 °C to +65 °C (–40 °F to +149 °F)
Relative humidity	up to 95%, not condensing
Connection	RJ45 jack for Ethernet and PoE, USB (Type A) and mini USB (Type A) for external devices
Power supply	PoE: IEEE 802.3af/at Class 3
Inbuilt Camera Image sensor	1/3 inch color CMOS
Camera Lens	F2.0, fixed aperture, 150° diagonal angle, 125° horizontal angle, 100° vertical angle
Camera illumination	5 LUX, Single LED for better illumination
Camera Resolution	1280 x 960
Video format	H.264, Motion JPEG (MJPEG)
Frame rate	30 FPS
Inbuilt SD Card Slot	upto 128 GB
Power Consumption	72 mA Standby & 155mA Maximum
Protocol	IPv4, IPv6, TCP, UDP, SIP, HTTP, HTTPS, RTSP, RTP, RTCP, IGMP, MLD, SMTP, FTP, DHCP, NTP, DNS
Encryption	TLS1.0, TLS1.1, TLS1.2
Packet Delivery	Unicast, Multicast
Audio Output	Impedance 600Ω 300vVMS (with 600Ω terminal)
Input	Contact Input Maximum 5 Form C dry contac (N/O or N/C)
Output	Contact Output Maximum 2 Form C dry contac (N/O or N/C) & 1 Audio Output
Paging Compatible	Yes , Inbuilt with Paging Sound Source
Recording	Internal capacity of 6 Days 24x7 Audio Video recording , Parallel 3rd Party recording facility with integeration
Onvif	Support the ONVIF "Profile S"
Server Requirement for Functioning	NO
Software require for Functioning	NO
Expandable Upto	9999 units
Others	Send e-mails / Schedule-linked messages if required through connectivity

Item No.2 : Master Control Unit

Parameter	Minimum Specification
Power source	Power-over-Ethernet(IEEE 802.3af Class 0)
Power consumption	*Standby 35mA, maximum 90mA*
Type of communication	Hands-free/Push-to-talk, Handset: Full-duplex/Push-to-talk
Monitor	7 inch TFT color LCD
SD Card Slot	upto 128 GB
On Board Camera	Yes Front Camera , with option of Privacy Cover
Material	Fire-retardant resin
LAN	Ethernet(10BASE-T, 100BASE-TX)
Audio codec	G.711(μ-law, A-law)、G.722
Video codec	H.264/AVC, Motion JPEG
Protocol	IPv4, IPv6, TCP, UDP, SIP, HTTP, HTTPS, RTSP, RTP, RTCP, IGMP, MLD, SMTP, FTP, DHCP, NTP, DNS
Encryption method	TLS1.0, TLS1.1, TLS1.2
Packet delivery	Unicast, Multicast
Input	Contact Input Maximum 4 Form C dry contac (N/O or N/C)
Output	Contact Output Maximum 2 Form C dry contac (N/O or N/C) & 1 Voice Input/ Output , External Speaker Output
Paging Compatible	Yes , Inbuilt with Paging Sound Source
Number of stations in address book	500 stations
Ambient temperature	0～40℃ (32～104°F)
Mounting	Desktop use (with desktop stand) or wall-mount
Auto Call Transfer	YES, Multi Party
Electrical box	3-gang box: wiring and fixing
ONVIF Profile	Support the ONVIF "Profile S"
Server Requirement for Fu	NO
Software require for Funct	NO
Expandable Upto	9999 units

Item No. 3 : Emergency Help TOWER	
Parameter	Minimum Specification
Type of Tower	Vandal Resistant Outdoor Tower, Hollow from Inside
Material of Tower	Steel
Height of Tower	12.5 Feet
Thickness	4mm minimum
Color Coating	25 micron Minimum
Tower Color	Red
Alphabetical Color	White
Side Content	Assistance & Emergency on both sides respectively
Dimension	12', 250x250 Holo Square , Emergency Help Tower for mounting of Flush Mount ECB having inbuilt PA system and HD CCTV, Camera, with Provision of mounting optional PTZ cameras on the top.

Item No:-4:- 30X Day/Night 60fps full HD PTZ IP Camera

Input / output	
Alarm input / output	4 Input (TTL 5Vdc), 2 Output (0.5A 120Vac,1A 24Vac) terminal block type
Audio input / output	one audio input / one audio output terminal block type (microphone not built in)
Live video	CVBS 1.0 Vp-p / 75 Ω terminal block type
Control Interface	RS-485, Half-Duplex, support MLP2
Video performance	
Low Light Mode (Color)	0.5 lux (1/30 sec, F1.6(Wide), 50IRE, AGC-Gain: 30dB ICR- OFF Color mode) 0.1 lux (1/30 sec, F1.6(Wide), 50IRE, AGC-Gain: 30dB ICR- ON B/W mode) 0.2 lux (1/ 8 sec, F1.6(Wide), 50IRE, AGC-Gain: 30dB ICR- OFF Color mode) 0.01 lux (1/ 8 sec, F1.6(Wide), 50IRE, AGC-Gain: 30dB ICR- ON B/W mode) 0 lux IR-ON
2D WDR	(90dB)
Video Streaming	
Video compression	H.264 Main and High Profile, Motion JPEG
Streaming	RTP/HTTP, RTP/TCP, RTP/UDP, Multicast
Bitrate	128Kbps – 12Mbps; Frame rate and bit rate controllable on- the-fly VBR / CBR / GOP supported
Power	
Power Input	AC/DC 24V, 80W
PoE	PoE (IEEE 802.3bt), 55W
Power Consumption	PoE++ (60W);Max. 55 W AC/DC24V;Max. 80 W
Video resolutions (H × V)	
1080p HD	1920 × 1080
720p HD	1280 × 720
D1	720 × 480, 720 × 576
CIF	352 × 240
Frame Rates	Dual-stream mode, H.264: up to 60 FPS @ 1920 × 1080, Motion JPEG: up to 30 FPS @ 720 × 480 2WDR mode, H.264: up to 30 FPS @ 1920 × 1080, Motion JPEG: up to 30 FPS @ 720 × 480
Night vision (infrared LED)	
Distance	150m
Peak wavelength	850nm
Beam spread	Automatically adjusted, Depending on the zoom ratio
Video Functions	
Day/Night (IR-cut filter)	Color (Day), Monochrome (Night), Auto
Scanning system	Progressive scan
White balance	ATW/Indoor(3200K)/Outdoor(5800K)/Manual (1800K – 10500K)
Shutter	Auto / manual 1 to 1/10,000
Exposure mode	Auto / Manual
Back light compensation	Off / BLC / WDR

Digital noise reduction	Off / On (2D, 3D)
Dynamic privacy zone mask	Off / On (up to 16 areas)
Auto mode	OFF / SCAN(16) / SEQ (256) / TOUR (16) / PATROL(16) / AUTO TRACKING
Web PTZ control	Pan, tilt, zoom-in / zoom-out, absolute position, and mouse click function
Schedule setting	Off / Auto Mode / Preset position
Digital image stabilization	Off / On
Sense Up+	Yes
Auto gain control	0 – 30dB
Other functions	Sharpness, Defog, Mirror effect
Sensor	
Sensor type	1/2.8" Type CMOS Sensor
Effective pixels	1944 (H) × 1224 (V) = 2,379,456 (pixels)
Total sensor pixels	1952 (H) × 1236 (V) = 2,412,672 (pixels)
Certifications	
CE	Compliance
FCC EMI Class B	Compliance
IP Rating	IP66 waterproof
Vandal Rating	IK10
Lens	
Zoom ratio	30X optical zoom
Focal length	4.3mm (WIDE) – 129mm (TELE)
Minimum aperture ratio	1:1.6 (WIDE)–5.0 (TELE)
Minimum object distance	10mm (WIDE end), 1.5m (TELE end)
Iris	F1.6–32, close
Angle field of view	Approx. 64.45° (H) 39.27° (V) (WIDE end), approx. 2.41° (H) 1.36° (V) (TELE end), (1080p mode)
Pan & Tilt	
Panning range	360° Endless
Panning mode	Manual, Auto, Manual Position, Sequential Position
Panning speed	Manual Approx. 0.1°/s – 120°/s 8 Steps, Preset Approx. 1°/s – 300°/s, Alarm Trigger Speed 300°/s
Tilting range	-30°–+210°
Tilting mode	Manual, Auto, Manual Position, Sequential Position
Tilting speed	Manual Approx. 0.1°/s – 120°/s 8 Steps, Preset Approx. 1°/s – 300°/s, Alarm Trigger Speed 300°/s
Integration	
Mobile application	iPhone, iPad, Android support
Video management	ONVIF Profile S
SD card recording	Support Micro SD/ SDHC/ SDXC card for circular recording
Firmware	Firmware upgrade via HTTP
Alarm event triggers	Alarm / motion / audio / Network loss detection
Alarm event actions	FTP, SMTP, HTTP post, SD card, SAMBA

Environmental	
Ambient operating temperature	-40°C to 50°C (-40°F to 122°F)
Operating humidity	0% – 90%
Network	
Ethernet	10/100/1000Mbps Base-T, RJ-45
Connectivity	ONVIF Profile S
Users	10 simultaneous users
PTZ preset scheduling	Yes, via Web interface
OSD	Text overlay for date, time, camera name, and PTZ position
OS	Embedded Linux 3.8.0
Audio	2-way audio, G.711 / PCM
Protocols	IPv4, IPv6, TCP, UDP, HTTP, HTTPS, SMTP, NTP, DDNS, UPnP, FTP, ARP, DHCP, PPPoE, DNS, RTSP, RTCP, Telnet, ICMP, IGMP, ONVIF Profile S, SNMP, SIP, Bonjour
IP Filter	Yes
Multi IP address	Yes
Main functions	
Control function	Pan and Tilt / Zoom and Focus / Iris and ICR / 256 Preset Position / Home Position
Digital zoom	16X
Zoom speed	0 – 7 Selectable [Fast: Approx. 6.0 Second (Tele to Wide) in Manual Mode]
Focus speed	0 – 7 Selectable [Fast: Approx. 6.0 Second (Far to Near) in Manual Mode]
Focus	Auto (Continue / Interval / Zoom Trigger / One Push), Manual Focus
Iris	Auto / Manual
Network Security	
User accounts	10 users account available
Access	Multiple user access levels with password protection
Encryption	Base 64 HTTP encryption
RTSP Authentication	On / Off

Item No: 5. 5MP Day & Night auto focus IR Bullet IP Camera

Video Resolutions (H x V)	
Resolution	5MP(2592 × 1944), 3.6MP(2560 × 1440), 3.1MP(2048 × 1536), 3MP(2304 × 1296), 2MP(1920 × 1080), 1.3MP(1280 × 960), 1MP(1280 × 720), D1(720 × 480, 720 × 576), VGA(640 × 480), CIF(352 × 240)
Maximum Frame Rate	Normal mode: up to 25 fps @ 2592 × 1944 HDR mode: up to 15 fps @ 2592 × 1944
Video Performance	
Min. Illumination	Color : 0.01 Lux at F1.4 ; B/W : 0.005 Lux at F1.4 ; 0 Lux with IR LED ON
Power and Environment	
Starting Temperature	-10°C – +50°C (14°F – 122°F)
Operating Temperature	-40°C – +50°C (-40°F – 122°F)

Storage Temperature	-25°C – +60°C (-13°F – 140°F)
Humidity	0% – 90% RH
Power Supply	DC12V ±10% (Terminal connector) / PoE+ (IEEE 802.3at compliant)
Power Consumption	DC12V, 12.5W / PoE+, 14.5W
Video Functions	
Scanning System	Progressive Scan
Infrared Cut Filter	Auto / Day (Color) / Night (Mono) / Schedule
White Balance	ATW-NARROW / ATW-WIDE / AWC(MANUAL)
Electrical Shutter	1/30(1/25)s – 1/30000s
Sense Up	Off / 1 Frame / 2 Frames
Sense Up+	Yes
Auto Gain Control	60 dB Variable Gain
S/N Ratio	More than 50dB (AGC off)
3D Noise Reduction	Off / 1 – 32 Selectable
2D WDR	Off / Auto / x2 / x3 / x4 (by normal mode) Support Onvif
High Dynamic Range	Up to 100dB (by HDR mode, 2 shutter line interleave)
Privacy Masking	Off / On (4 zones)
Image Effects	Brightness, Contrast, Hue, Saturation, Sharpness, Mirror, Flip, Rotation
Auto Focus	One Push
Smart IR	Yes
EV (Exposure Value)	Adjustable
Lens distorsion correction (LDC)	Yes
Lens / Night vision (infrared LED)	
Focal Length	2.8 – 12 mm (zoom / focus motorized)
Iris	F1.4 (W) – F2.8 (T)
Angle of View	87° (W) – 30°(T) (H) 62° (W) – 23°(T) (V) 114° (W) – 37° (T) (D)
Peak Wavelength	850nm
Beam Spread	60° , 90°
Radiant Distance	40M
Sensor	
Pick Up Element	1/2.8" CMOS image sensor
Effective Pixels	2616 (H) × 1964 (V) = 5,137,824 (pixels)
Certifications	
CE	Compliance
FCC	compliance
IP Rating	IP68
Integration	
Mobile Application	iPhone, iPad, Android support
Video Management	ONVIF Profile S / IVS events,
SD Card Recording	Support (128GB) Micro SD/SDHC/SDXC card for circular recording
Maintenance	Firmware update via HTTP and IP Scan; Firmware available at web site
IVS Basic	Motion Detection, Tampering Detection, Advanced Motion Detection, Tripwire, Traffic Light Detection, Object Counting

Event Triggers	Motion / Tamper / Audio / Alarm / Network lost detection
Event actions	FTP / SMTP / HTTP post / SD card / SAMBA / SMTP Trap
Casing Material	Aluminum alloy
Window	Ø75 Heat Resistant Glass & Rain repellent glass
Input / Output	
Audio Input / Output	Mono, 1.98 Vp-p , 2.2KΩ , Terminal Block
Audio	Two-way Audio, G.711 u-law / PCM / AAC, SIP
Alarm Input / Output	Digital 1 input (TTL, +3 – 5VDC) / 1 Output (MOS Relay contact N.O., Load.max. 40VDC,450mW/300mA,450mW), Terminal block
Network	
Ethernet	10/100 Mbps Base-T, RJ-45
ePTZ & Digital Zoom	Compliance
OS	Embedded Linux 3.10
Network Protocols	IPv4, IPv6, TCP, UDP, HTTP, HTTPS, SMTP, SIP, MQTT, QoS, SNMP V1/V2/V3, SNMP Trap and heart beat, NTP, DDNS, UPnP, FTP, ARP, DHCP, PPPoE, DNS, RTSP, RTCP, Telnet, ICMP, IGMP, ONVIF Profile S , SDDP, Bonjour , 802.1x
User accounts	10 user accounts available
Watermark	BMP logo
Log	Event & operation log & IVS event log
Schedule	Support holiday list
Network Storage	NAS (Support SAMBA/CIFS)
Video Streaming	
Video Compression	H.265/HEVC main profile, H.264 main and high profile , Motion JPEG
Video Streaming	RTP/HTTP, RTP/TCP, RTP/UDP, Multicast 4 configurable streams in H.265 and H.264 and Motion JPEG, configurable frame rate and bandwidth
Number of streams	4
Video Bitrate	128Kbps – 12Mbps; Frame rate and bit rate controllable on-the-fly; VBR / CBR / GOP supported, Fixed bitrate, Smart H.264/H.265
N**etwork Security**	
Encryption	Base64 HTTP encryption, HTTPS encryption
Authentication	Digest HTTP authentication, RTSP authentication, TLS, 802.1x, DDNS via HTTPS
Address Filter	IP address filter, MAC address filter
Access	Multiple user access levels with password protection
Users	10 simultaneous users
Multi IP address	Yes

Item No: 6. 5MP Day & Night auto focus IR Vandal Resistant Dome IP Camera

Video Resolutions (H x V)	
Resolution	5MP(2592 × 1944), 3.6MP(2560 × 1440), 3.1MP(2048 × 1536), 3MP(2304 × 1296), 2MP(1920 × 1080), 1.3MP(1280 × 960), 1MP(1280 × 720), D1(720 × 480, 720 × 576), VGA(640 × 480), CIF(352 × 240)
Maximum Frame Rate	Normal mode: up to 25 fps @ 2592 × 1944 HDR mode: up to 15 fps @ 2592 × 1944

Video Performance	
Min. Illumination	Color : 0.01 Lux at F1.4 ; B/W : 0.005 Lux at F1.4 ; 0 Lux with IR LED ON
Power and Environment	
Starting Temperature	-10°C – +50°C (14°F – 122°F)
Operating Temperature	-40°C – +50°C (-40°F – 122°F)
Storage Temperature	-25°C – +60°C (-13°F – 140°F)
Humidity	0% – 90% RH
Power Supply	DC12V ±10% / PoE (IEEE 802.3af compliant)
Power Consumption	DC12V, 7.5W / PoE, 9W
Video Functions	
Scanning System	Progressive Scan
Infrared Cut Filter	Auto / Day (Color) / Night (Mono) / Schedule
White Balance	ATW-NARROW / ATW-WIDE / AWC(MANUAL)
Electrical Shutter	1/30(1/25)s – 1/30000s
Sense Up	Off / 1 Frame / 2 Frames
Sense Up+	Yes
Auto Gain Control	60 dB Variable Gain
S/N Ratio	More than 50dB (AGC off)
3D Noise Reduction	Off / 1 – 32 Selectable
2D WDR	Off / Auto / x2 / x3 / x4 (by normal mode) Support Onvif
High Dynamic Range	Up to 100dB (by HDR mode, 2 shutter line interleave)
Privacy Masking	Off / On (4 zones)
Image Effects	Brightness, Contrast, Hue, Saturation, Sharpness, Mirror, Flip, Rotation
Auto Focus	One Push
Smart IR	Yes
EV (Exposure Value)	Adjustable
Lens distorsion correction (LDC)	Yes
Lens / Night vision (infrared LED)	
Focal Length	2.8 – 12 mm (zoom / focus motorized)
Iris	F1.4 (W) – F2.8 (T)
Angle of View	87° (W) – 30°(T) (H) 62° (W) – 23°(T) (V) 114° (W) – 37°(T) (D)
Peak Wavelength	850nm
Beam Spread	60° , 90°
Radiant Distance	30M
Sensor	
Pick Up Element	1/2.8" CMOS image sensor
Effective Pixels	2616 (H) × 1964 (V) = 5,137,824 (pixels)
Certifications	
CE	Compliance
FCC	Compliance
IP Rating	IP67
Vandal Resistant Rating	IK10
Integration	
Mobile Application	iPhone, iPad, Android support

Video Management	ONVIF Profile S / IVS events,
SD Card Recording	Support (128GB) Micro SD/SDHC/SDXC card for circular recording.
Maintenance	Firmware update via HTTP and IP Scan; Firmware available at web site
IVS Basic	Motion Detection, Tampering Detection, Advanced Motion Detection, Tripwire, Traffic Light Detection, Object Counting
Event Triggers	Motion / Tamper / Audio / Alarm / Network lost detection / SmartEvent
Event actions	FTP / SMTP / HTTP post / SD card / SAMBA / SMTP Trap
Languages	English,
Mechanical	
Casing Material	Aluminum alloy
Input / Output	
Audio Input / Output	Mono, 1.98 Vp-p , 2.2KΩ , Terminal Block
Audio	Two-way Audio, G.711 u-law / PCM / AAC, SIP
Alarm Input / Output	Digital 1 input (TTL, +3 – 5VDC) / 1 Output (MOS Relay contact N.O., Load.max. 40VDC,450mW/300mA,450mW), Terminal block
Network	
Ethernet	10/100 Mbps Base-T, RJ-45
ePTZ & Digital Zoom	Yes, ROI (Region of Interest)
OSD	Position configurable text overlay for date, time, camera ID, event status and watermark with customizable user demand data
OS	Embedded Linux 3.10
Network Protocols	IPv4, IPv6, TCP, UDP, HTTP, HTTPS, SMTP, SIP, MQTT, QoS, SNMP V1/V2/V3, SNMP Trap and heart beat, NTP, DDNS, UPnP, FTP, ARP, DHCP, PPPoE, DNS, RTSP, RTCP, Telnet, ICMP, IGMP, ONVIF Profile S , SDDP, Bonjour , 802.1x
User accounts	10 user accounts available
Log	Event & operation log & IVS event log
Schedule	Support holiday list
Network Storage	NAS (Support SAMBA/CIFS)
Video Streaming	
Video Compression	H.265/HEVC main profile, H.264 main and high profile , Motion JPEG
Video Streaming	RTP/HTTP, RTP/TCP, RTP/UDP, Multicast 4 configurable streams in H.265 and H.264 and Motion JPEG, configurable frame rate and bandwidth
Number of streams	4
Video Bitrate	128Kbps – 12Mbps; Frame rate and bit rate controllable on-the-fly; VBR / CBR / GOP supported, Fixed bitrate, Smart H.264/H.265
Network Security	
Encryption	Base64 HTTP encryption, HTTPS encryption
Authentication	Digest HTTP authentication, RTSP authentication, TLS, 802.1x, DDNS via HTTPS
Address Filter	IP address filter, MAC address filter
Access	Multiple user access levels with password protection
Users	10 simultaneous users
Multi IP address	Yes

Item No. 7 GIGABIT POE SWITCH

• **Ethernet** :10/100/1000 8 port switch (with 4 port PoE) 53 W

Item No. 8

UTP Cat 6e 500 Mhz Cable (305Mtr Drum Box)

Item No. 09 IP 55 6U Rack with accessories

IP 55 Outdoor Pole	Rack 6U X 550mm W X 500 mm D
Construction of Material	1.2/1.5mm Thick CRCA sheet
Each rack includes	A very compact design, welded structure with front accessible, The side panels are integrated type & welded with canopy & bottom cover ,Rigid frame that can be fixed to the pole, Front Door with Filter, Louver & T type Lock, 90CFM, 230V AC Fan - 2 Nos, front door, Self adhesive thermal foam from inside
Door Hinges Cable PG 11 19" Angles 6U Powder Coating	2 Nos 6 Nos At bottom side for cable entry 2 Nos for equipment Thickness is 60 to 80 microns

Item No.	Description of items
10	Horn speaker with inbuilt Amplifier compatible with Control & Call Unit.
11	SM OFC Patch Cord SC to LC type (3 Mtr)
12	12 Port Loaded LIU Rack mount fully loaded
13	SM 6 core armored Fiber cable (per meter)
14	SM Media Converter 10/100/1000
15	40 mm HDPE PLB pipe (per meter)
16	Underground OFC laying in HDPE pipe in 3 feet depth
17	1.5 mm Armored Power Cable (per meter)
18.	IP Camera Poll 20 feet Height , min. 55 Kg weight, Proper Hole and brackets inbuilt for 3 cameras , Have capsity for take load of 35 kg on within 6 feet from the top of the pole. Must be supply with proper pent and protected with anti-rust including installation & foundation of Poll.
19	Civil Construction & Fabrication for Emergency Help Tower
20	Per Camera Installation Charge : Cover Laying Charges (Includes - G.I Pipe ,PVC Pipe, Capping / Casing, Screw and related Accessories Splicing & Termination and OTDR report One to another location)

Details of Location

Sl. No.	Location	Connection from Near Switch	Camera	IP 55 BOX	Media Converter	CCTV Pole	Power Cable	Fiber Cable	Fiber Pigtail	HDPE pipe	Digging	UTP Cable	Switch 8 port	Conduit pipe 3/4 in
	Corner Ensulatore Room	Library	2	1	2	1	360	370	12	350	350		2	
	Juan Ward	Frued Ward	1	1	2	1	50	50	12	40	40		2	
	CPWD Digiset Type III Area	RHC Ward	1	1	2	1	120	130	12	100	100		2	
	Between Library & Ensulatore room corner		2	1	2	1	180	185	12	175	175		2	
	Girls hostel	New Boy's Hostel	4									4 boxes	4	120 mtr
		Total	**10**	**4**	**8**	**4**	**710**	**735**	**48**	**665**	**665**	**1220 MTR**	**12**	**120 mtr**

Special Requirements

1. Installation, testing & commissioning should be done on site on turnkey basis.
2. The instrument should be supplied with all standard accessories and instruction manual.
3. Warranty 5 year.
4. AMC / CMC rates must be provided for 5 years after the warranty period.
5. A firm assurance of manufacturer to be given regarding the supply of spares/accessories for next 5 years after the warranty period.
6. Items & Locations may be change as per requirement.

Section-V

Technical Specifications for High Definition Transcranial Direct Current Stimulator (HDtDCS) with hybrid EEG

Main Features

1. The system should be a comprehensive transcranial Cortical Stimulation (tCS) system which should be able to perform the following cortical stimulation paradigms:

a. Transcranial Direct Current Stimulation (tDCS)
b. Transcranial Alternating Current Stimulation (tACS)
c. Transcranial Random Noise Stimulation (tRNS)
d. Sham Stimulation

2. The system should be high definition with minimum no of channels being 32
3. Should be able to record EEG
4. Stimulation should be compatible with simultaneous EEG monitoring (not necessarily on the same site)
5. Stimulation and EEG monitoring should be possible at the same site with the same electrode (not simultaneously)
6. EEG monitoring should be possible before, during and after stimulation
7. The system should have flexible electrode placement based on the 10-10 system
8. EEG should have minimum following specifications or better

a. EEG sampling rate: 500 SPS
b. EEG bandwidth 0-125 Hz (DC coupled)
c. EEG resolution 24 bits – 0.05 μV
d. EEG measurement noise: <1 μV RMS
e. Common mode rejection: < -115 dB
f. EEG input impedance: 1 GΩ

9. The system should be able to adapt to customized waveforms
10. Stimulation system should have the following minimum characteristics:

a. Stimulation sampling rate: 1000 SPS
b. Stimulation frequency range: 0-250 Hz (tACS); 0-500 Hz (tRNS)
c. Sham and double blind mode
d. Current resolution: 1 μA
e. Maximum voltage: ± 15V per electrode (allows 30 V of stimulation potential difference)
f. Data transmission: wireless (wi-fi network) and wired (USB cable)
g. Current accuracy: More than or equal to 1%

11. The following should be the stimulation safety parameters:

a. Maximum current per channel: ± 2mA
b. Maximum total injected current: 8 mA (by all electrodes, at any time)
c. Maximum duration per session: 1 hour
d. Electrode impedance check before and during the stimulation
e. Automatic abort function if impedance exceeds 20 kΩ
f. Manual abort function possible at any time

Other Requirements:

12. Holter mode use should be present for offline data storage in microSD card with a minimum capacity of 128 GB or better

13. The system should have 3 axis accelerometer @ 100 SPS (sampling rate)
14. Battery operating time: 8 hours (combined EEG/tCS) or better
15. EEG output should be EDF+ (16 bits), ASCII data files or TCP/IP raw data streaming
16. Stimulation output: ASCII data files
17. OS compatibility: Windows and MAC OS X (must be compatible with latest versions)
18. Sponge electrodes (35 cm^2, 25 cm^2 and 8cm^2) to be used with saline solution for stimulation
19. Gel based electrodes for both stimulation or EEG recording
20. Should be supplied with Dry Electrode Cap for EEG recording
21. Should be able to receive external triggers via software or via hardware using a TTL connection
22. EEG visualization in the software (time domain, spectrum, spectrogram, band power, scalp map and cortical map using inverse modeling)
23. Stimulation electric field visualization based on a realistic head model
24. Should have facility to use together with cloud service for remote session controlled by the user
25. Should be supplied with stimulation template to focus on a specific region of the brain. Should have the facilities to use MRI image of patient of optimization.
26. Should be MRI and/or fMRI compatible and price should be quoted separately as optional.
27. Should have the facility for MEG compatibility and price should be quoted separately as optional.

Special Requirements:

28. The system should be supplied with a compatible, high end, movable, strong, multifunction and durable trolley made or supplied by the principal/manufacturer.
29. Should be supplied with one high performance desktop/laptop computer with latest processor with high processing speed at least 3.0 GHz, Memory (RAM) of minimum 16 GB, Hard drive capacity of at least 2 TB, 2 Tb of external HDD, all data transfer ports including high speed ethernet port, USB 3.0, and high end color laser printer.
30. The CD/DVD/Bluray writer should be able to archive EEG data on a CD/DVD/Blu-ray, which should have the capability to be read on any Windows/Mac, based PC without any additional software. Similar archiving should be available with Pen drives or any other removable storage media.
31. Only vendor who is able to quote and deliver all equipment/machines will be considered.
32. The system should comply with CE and IEC standards and quality. Device should be CE 93/42/EEC marked and meet the following standards: EN 60601-1-1, EN 60601-1-2, EN 60601-1-26
33. The system delivery should include installation on turnkey basis with dedicated onsite training to end users by the authorized representatives from the principal manufacturers.
34. Warranty must be 5 year.
35. Should also quote for CMC / AMC for the next five years. A firm assurance of manufacturer to be given regarding the supply of spares/ accessories for 5 years after the warranty period.

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Section-V

Technical Specification for Digital Radiography System with Single Detector for Whole Body Digital radiography

1. Specifications for Digital X-ray Machine

a. A fully digital radiography system capable of detector exposure and image acquisition on vertical, horizontal and oblique position to perform all skeletal body and chest radiography. Complete system operation with control of generator, X-ray tube and imaging system from a single integrated user interface should be possible.
b. The system should have wired two detectors in bucky stand and table, with one integrated control console capable of controlling Generator, X ray tube, imaging system from the central console.
c. System should have a ceiling mounted X ray tube support capable of motorized movement in Z axis direction /electromagnetic breaks with fully counter balanced mechanism.

2. Generator:

a. Generator should be of latest technology with High-frequency, multiples generator with inverter principle and automatic exposure control (AEC) for constant output.
b. Output – Minimum 80 kW or higher.
c. kV range should be atleast 40 kV – 150k V
d. Output at 100 kV should be atleast 800 mA or more
e. It should have automatic exposure control device (AEC)
f. It should have digital display or kV and mAs and ms in the console and the tube housing
g. It should have overloading protection.

3. X-ray tube and Collimator

a. The X-ray tube should be ceiling mounted with rotating anode with high speed of 8000 RPM or higher, fully compatible with the generator and must have dual focus. Focal spot of the following size are required:
b. Large focus: 1.2 mm or less
c. Small focus: 0.6 mm or less
d. Tube should be with anode heat storage capacity of 800 k HU or more
e. The X-ray tube should have Multi leaf collimator having halogen lamp/bright light source.
f. Collimator should have a rotation of up a maximum of + 45º, should have manual and motorized control and controllable using the organ programs.
g. The X-ray tube should be manufactured by the manufacturer of the X-Ray system.

4. Ceiling mounted column support

a. Ceiling mounted tube support with Auto tracking in z- direction should be provided
b. Movement should be motorized.
c. A color touch screen should be available on the X ray tube for control and display of multiple functions. Touch screen should correct display orientations, when the tube is rotated also.
d. Vertical rotation of atleast 180 cm or more should be available
e. It should have provision of auto centering in z- direction
f. Minimum focus to ceiling distance should be atleast 80 cm or more.
g. Specify the horizontal and vertical tube rotation angle around the respective axes.
h. Tube rotation should be possible in the horizontal and vertical axis and rotation of tube about vertical axis at +/- 90 degree should be possible with stop position at 0 degree, 90 degree and 180 degrees.
i. Specify the horizontal and vertical travel range of the tube

5. Patient Table

a. Horizontal Table with four ways floating table top.

6. Vertical Bucky stand with integrated detector

a. The unit should be provided with Vertical Bucky with tilt facility
b. It should have provision to do chest radiography without grid
c. The vertical Bucky stand should accommodate an integrated solid state detector of size atleast 43 cm x 43 cm
d. The minimum grid ratio of the moving grid on the vertical Bucky should be 10:1 and not less.
e. Tilt of the vertical Bucky must be possible between - 20º to + 90º with stop at 0 deg. & 90 deg.
f. Tube tracking should be possible in the vertical direction
g. It should have automatic exposure control.

7. Integrated Detector system in the patient table:

a. The detector in the table should be of solid state flat detector
b. The size of detector should be atleast 34 cm x 39 cm or more.
c. The activity detector matrix should be 2 K x 2 K or more
d. The pixel size should be atleast 150 µm or less
e. The resolution should be minimum of 3.4 lines pair/millimeter
f. Detector Quantum Efficiency (D.Q.E) should be more than 50% or more at 14 bits/Pixels.
g. Two replaceable batteries with capacity atleast 3hrs in normal operations.

8. Image acquisition and image processing based on body part and viewing position

a. The digital workstation should be based on the latest high speed processor of at least 12 bit
b. It should have the possibility of acquiring the image from the detector system and retrieval of patient list and examination data from Hospital/Radiology Information systems (HIS/RIS) should be possible.
c. It should have image storage disk of 10,000 images or more.
d. The system should have ready DICOM Interface and networking capability with RIS/HIS/PACS
e. Post processing function must be available.
f. Console station must be provided for image processing, image display, post processing function and networking with anti-glare color monitor of LCD type with size atleast 20 inch with matrix of 1024 x 1024 or higher
g. Dry laser camera of 500 dpi or more for printing the images on film should be available.

9. Essential Accessories

a. Voltage stabilizer for the complete DR system should be quoted along with the unit, It should be of required capacity and the make and capacity of the voltage stabilizer should be specified.
b. On line 3kva UPS with suitable rating and 60 minutes back up for console / digital system should be supplied with DR systems

10. Warranty

a. The system delivery should include installation on turnkey basis with dedicated onsite training to end users by the representatives from the principal manufacturers.
b. Warranty must be at least 5 years.
c. Should also quote for CMC / AMC for the next five years. A firm assurance of manufacturer to be given regarding the supply of spares/ accessories including the x-ray tube and Flat panel detector for 5 years after the warranty period.

11. Others

a. Buy back of Allenger Make X-Ray machine (300 mA).
b. The detector, generator and the X-ray tube of the system at least two of them should be supplied from the same manufacturer so that the parameters match with accuracy. The system should be supplied only by reputed X-ray manufacturers with good track record of life of the DR systems including X-ray tube, detector etc. Also the detector and software should be from the same manufacturer. The company should have proven track record in Govt. sector.
c. The system should have all necessary approvals such as ISO, EN ISO, CE /FDA approval and AERB Type approved.
d. Atleast five (05) installations of DR system in the country.

Section-V

Technical Specification for items /commodities/work required for development of one conference room for academic and training activities and development of One In Charge Room, One Sr. Consultant Room, 03 Nos. of Consultant Room at S. S. Raju Centre for Addiction Psychiatry of CIP

S. No.	Commodities/Works/Items	Area/No.
1.	Table- Area approx. 65 sqft.:- Oval shaped conferenced table will made up of 19 mm & 12 mm thick gurjan core face water proof pine wood ply, top of the table covered with Matty laminate. There will be two Drawer in both side of the table with electrical switch inside the table for power output for multi uses.	65 Sqft. Approx.
2.	Table will be made of 19 mm & 12 mm thick pine wood ply with gurjan core finish, top of the table covered with Matty laminate. There will be two drawers in centre of the table. There will be an electrical switch inside the table for power output for multi uses. (Area: approx. 30 Sqft., In charge Room, Area: approx. 15 Sqft., Senior Consultant Room , Area: approx. 15 X 3 = 45 Sqft., 03 Nos. of Consultant Room,)	90 Sqft. Approx.
3.	Table for Printer (Area: Approx. 20 Sqft. for Conference Room)	20 Sqft. Approx.
4.	Wooden Flooring- 4'*6" wooden plank (premium quality) with thickness 8mm, water absorption <0.5%, braking strength >35N/mm2 (Approx. Area 400 sqft with skirting, for Conference Room, Area: 185 Sqft for In Charge Room, Area: 185 Sqft for In Sr. Consultant Room, Approx. Area 185 sqft X 3 = 555 Sq. ft. for 03 Nos. of Consultant Room)	1325 Sqft Approx.
5.	Stool (H 20"XW12"X D12") Primary material- Metal, Seating Height-16 ") 01 No. for Incharge Room, 01 No. for Sr. Consultant Room, 03 Nos. for 3 Nos. of consultant Room)	5 Nos.
6.	Executive Chair with full length back support; adjustable lumbar support and instant seat height adjustment (16 Nos. for Conference Room , 01 No. for In Charge Room, 01 No. for Sr. Consultant Room, 03 Nos. for 3 Nos. Consultant Room)	21 Nos.
7.	Normal Executive Chair 3 Nos. for In Charge Room, 03 Nos. for Sr. Consultant Room, 9 Nos. for 3 Nos. each for 03 Nos. of Consultant Room	15 Nos.
8.	Centre Table with Glass top (Area: Approx. 4X2 Sqft=8 Sqft, for In charge Room)	1 No(8 Sqft Approx.
9.	Designer Shelf with Drawer in 3 shelf (Size-4X4=16 sq.ft. Approx. for In charge Room)	1 No. (16 Sqft Approx.)
10.	Shelf with Drawer (Size 3X 3= 9Sqft for Sr. Consultant Room, Size 3X 3= 9Sqft X 3 = 27 Sq.ft. for 3 Nos. of. Consultant Room)	4 Nos.(36 Sqft)
11.	Bathroom Door Size-7X3=21 sqft. Approx. for In charge Room)	21 Sqft Approx.
12.	3 Seater Sofa with Cushion 1 Nos. for In charge Room, 1 No. for Sr. Consultant Room)	02 Sets
13.	Wall Pilling: Wall will be covered with 12mm thick pure water proof ply final finish with matching veneer and polish. (Area: Approx. 476 Sqft. For In Charge Room)	476 Sqft. Approx.
14.	False ceiling: 12mm Thick Gypsum Board Size: 6x4 will be hang on GI Channel Gap will be filled with fiber tape and final finished with Compound. (Area: Approx. 250 Sqft FOR In Charge Room, Size: 250 Sqft for Sr. Consultant Room, Size: 250 Sqft for Consultant Room).	750 Sqft Approx.
15.	Wall Paper and Texture on Wall (Area: Approx. 772 Sqft. for Conference Room, Area: Approx. 476 Sqft. for 1 No. of Sr. Consultant Room Area: Approx. 476 Sqft. X 3 = 1428 sqft for 03 Nos. of Consultant Room,)	2676 sqft Approx.
16.	Blinds (Size 100sqft. Approx. for Conference Room, Size: 32 sqft for In charge Room, Size: 32 sqft for Sr. Consultant Room, Size: 32 sqft X 3 = 66 Sqft for 3 Nos. of Consultant Room)	230 sqft Approx.

17.	Door- 32 mm thick flush door, with 1mm thick laminate, 18" handle of both sides. Size-7X3.5=24.5 Approx. for Conference Room, Size-7X3.5=24.5 Approx. for In charge Room, Size-7X3.5=24.5 Approx. for Sr. Consultant Room, Size-7X3.5=24.5 X 3 = 73.5 sqft Approx. for 3 Nos. of Consultant Room)	147 Sqft Approx.
18.	Door Pilling: Size-30 Rft. Approx. for Conference Room, Size-30 Rft. Approx. for In Charge Room, Size-30 Rft. Approx. for Sr. Consultant Room, Size 30rft approx. X 3= 90 rft approx. for 03 Nos. of Consultant Room,)	180 Rft. Approx.
19.	Bathroom Partition (Approx. Area 50 sqft for In charge Room)	50 Sqft Approx.
20.	Commode Pan with water Tap for In charge Room)	1 No.
21.	Wash Basin with fittings for In charge Room)	1 No.
22.	Plumbing for 1 Lot for In charge Room)	1 Lot
23.	Exhaust Fan for In charge Room)	1 No.
24.	Ceiling LED Light 18Watt 12 Nos. for Conference Room, 12 Nos. for In Charge Room, 8 Nos. for Sr. Consultant Room, 24 Nos. (8 Nos each Room) for 3 Nos. Consultant Room)	56 Nos.
25.	Cassette AC 2 Ton With 5 KVA Automatic Stabilizer, with Bracket, Copper Pipe 2 Nos. for Conference Room, 1 No for In Charge Room,.	3 Nos.
26.	Cassette AC 1.5 Ton With 4 KVA Automatic Stabilizer, with Bracket, Copper Pipe 1 No. for Sr. Consultant Room, 03 Nos. for 3 Nos. Consultant Room)	4 Nos.
27.	49"LED TV Full HD Smart TV (In Charge Room)	1 No.
28.	Electric Work 1 Lot for Conference Room, 1 lot for Sr. Consultant Room, 03 Lots. for 3 Nos. Consultant Room)	5 Lots
29.	I/O Box – 6 Nos for Conference Room, 1 no. for In charge Room, 1 No. for Sr. Consultant Room, 03 Nos. for 3 Nos. Consultant Room))	11 Nos.
30.	Utility Box (Area: approx. 18 qft., for In charge Room, Area: approx. 40 Sqft., Senior Consultant Room , Area: approx. 40 Sqft X 3 = 120 sqft for 03 Nos. of Consultant Room,)	5 Nos. (2188 Sqft Approx.)
31.	Switch 24-Port for Conference Room	1 No.
32.	UTP CAT6 Cable (in Box) for Conference Room	2 Boxes
33.	Conduit Pipe (in Meter) (120 meters) for Conference Room	120 mtrs
34.	AV System For Conference Room(As mentioned Below from A to K)	01 Set
A	Professional Grade wireless AV transmission gateway with Two cross one switching System	1 No.
B	Professional Grade Point Source Speaker with OEM Bracket	2 Nos.
C	Professional Grade Multi Channel Amplifier for Point Sources	1 No.
D	Industrial Grade CPU with Digital Signal Processor for Unified Applications	1 No.
E	Professional Grade 20 meters HDMI 2.0 Active Optical Cable	2 Nos.
F	Professional Grade 5 meters HDMI Patch Cords	2 Nos.
G	16 AWG Speaker Cable (In 100 Meters)	1 No.
H	Professional Grade Microphone system with Central Control unit with gooseneck Microphone:	1 No.
I	Professional Grade Client Unit with Gooseneck Microphone (One for Two seating):	8 Nos.
J	10 meters Connecting Cable for Discussion Units with Control Unit:	1 No.
k	Installation Of the system	1 Lot
35.	86 Inches Professional Grade Display(For 1 No. of Conference Room)	1 No.

34.Specification For AV System (Conference Room)

A. Professional Grade AV Transmission Gateway				
Sl. No.	Parameter	Technical Specifications	Compliance (Yes/No)	Deviations
I.	System	It shall consist of One AV Gateway Unit with Four USB 2.0 based or better Wireless Transmitters.		
II.	Scalability	It shall be scalable to support Twenty Eight or more Transmission units.		
III.	Bandwidth	It shall have a communication bandwidth of Three Hundred mbps or more.		
IV.	Signal Trasmission	It shall support signal transmission between Gateway Receiver and Transmitter upto Thirty Five meters or better.		
V.	Integration	It shall get integrated with the calling device.		
VI.	Annotation	It shall be able to send and receive annotation controls wirelessly when an interactive device is connected to the gateway data output.		
VII.	Platforms	It shall support platforms like ipad, iOS, Mac, Windows or more.		
VIII.	Resolutions	It shall support Full HD or HD or more resolutions.		
IX.	Switching	This along with the Transmitters shall work as wireless 4x1 switching system and shall give access to the latest Wireless Transitter whose transmission switch is put to Momentary Close Circuit State.		
X.	Video Interface	It shall have HDMI Output Interface for Video and Audio.		
XI.	Audio Interface	It shall have 3.5mm Setero Audio Interface or better.		
XII.	Data Interface	It shall have atleast 1 USB 2.0 Port and atleast 1 USB 3.0 Port.		
XIII.	Network Interface	It shall have RJ-45 Interface for Wired Network and WLAN for connecting to wireless networks.		
B. Professional Grade Point Source Speaker with Bracket				
Sl. No.	Parameter	Technical Specifications	Compliance (Yes/No)	Deviations
I	Audio	Supply, Installation, Testing and Commissioning of Loudspeakers with Drivers 2x 10" LF or 1x 15inch / 1 x 1,4" HF Coaxial , Frequency range 60 - 18K Hz; Power capacity programm / peak:1000/2000W ; Impedance- 8 Ohm , Coverage range (h x v) 60° x 40°/90° x 50°, rotatable HF-Horn; Sensitivity 1 W / 1 m - 106 dB,SPLmax / peak 138 dB,		
C. Professional Grade Amplifier for Point Sources				
Sl. No.	Parameter	Technical Specifications	Compliance (Yes/No)	Deviations
I	Amplification	SITC of Four Channel amplifier with inbuilt DSP, 1500W @2ohm , 1200W @4 ohm; 1200W @8ohm and 3000W @4Ohm and 2400W@8Ohm in bridge mode; Maximum output voltage 140Vpeak and 45Apeak current; Frequency Response 20Hz-20KHz;S/N Ratio- 110dBA; Crosstalk >70dB@1Khz;THD+N < 0.2%; Slew Rate->50V/microSec; Damping Factor >500@ 20-100Hz; A/D and D/A Converters of 24bit/48KHz; DSP Inbuilt Preset Memory; Crossover Filters - linear phase (FIR), Butterworth, Linkwitz-Riley, Bessel: 6 dB/oct to 48 dB/oct (IIR);Input Equalizers - Raised-cosine, custom FiR, parametric iiR: peaking, hi/lo-shelving, all-pass, band-pass, band-stop, hi/lo-pass; Output Equalizer ; Limiters - P TruePower™, RMS voltage, RMS current, Peak limiter; Audio signal input 1 x 12 pin Phoenix MC 1.5/12-ST-3.81 - Signal input – MAIN; Loudspeakers 1 x 8 pin Phoenix DFK-PC 4/8-G-7.62 - Signal output; Network/data 1 x USB plug -speakers presets, separate input and output DSP.		

D. Industrial Grade CPU				
Sl. No.	Parameter	Technical Specifications	Compliance (Yes/No)	Deviations
I.	Processor	It shall have Core i5 or better processor		
II.	RAM	It shall have 8 GB or more RAM		
III.	HDD	It shall have 1 TB or more HDD.		
IV.	Video Interface	It shall have at least two HDMI or DP outputs		
V.	Form Factor	It shall have Mini Form Factor		
VI.	USB 3.0	It shall have at least 2 USB 3.0 Ports		
VII.	USB 2.0	It shall have at least 2 USB 2.0 Ports		
VIII.	RJ-45	It shall have at least 1 RJ-45 port		
IX.	AEC	It shall have inbuilt echo cancellation with external Microphone integration or shall be supplied with full duplex DSP with USB Port.		
X.	Keyboard/Mouse	It shall be supplied with wireless Keyboard and Mouse		
E. Professional Grade 20 meters HDMI 2.0 Active Optical Cable				
Sl. No.	Parameter	Technical Specifications	Compliance (Yes/No)	Deviations
I.	Cable Length and Type	20 meters HDMI Active Optical Cable Type A to Type A.		
II.	Data Rate	It shall support data rate of up to 18.2 Gbps		
III.	Signal Support	It shall support resolutions of up to 3820x2160@60 Hz or better		
IV.	Power Consumption	It shall have a Power Consumption of 250mV or better.		
V.	Dynamic Bend Radius	It shall have a dynamic bend radius of 80mm or better.		
VI.	Static Bend Radius	It shall have a static bend radius of 40mm or better.		
VII.	Signal Transmission	It shall support lossless signal transmission up to 100 meters or better.		
VIII.	Version	It shall be HDMI 2.0 or better.		
IX.	HDCP	It shall support HDCP 2.2 or better.		
X.	Cable OD	It shall have an outer diameter of 4mm or less.		
XI.	RF & EMI	It shall be highly resistant with RF and EMI interference.		
XII.	External Power Supply	It shall work without the use of External Power Supplies.		
F. Professional Grade 5 meters HDMI Patch Cords				
Sl. No.	Parameter	Technical Specifications	Compliance (Yes/No)	Deviations
I.	Cable Length and Type	5 meters HDMI Type A to Type A.		
II.	Data Rate	It shall support data rate of up to 18 Gbps		
III.	Signal Support	It shall support resolutions of up to 3820x2160@60 Hz or better		
IV.	Contacts	It shall have Gold Plated Contacts for Signal Integrity.		
V.	Dynamic Bend Radius	It shall have a dynamic bend radius of 90mm or better.		

VI.	Insulation Resistance	It shall have an insulation resistance of 100 ohms or better.		
VII.	Dielectric Strength	It shall have a Dielectric Strength of 500V/minute or better.		
VIII.	Version	It shall be HDMI 2.0 or better.		
IX.	Frequency	It shall have up to 1536 Khz or better Audio Sample Frequency for highest audio fidelity.		
X.	RF & EMI	It shall be highly resistant with RF and EMI interference.		
XI.	External Power Supply	It shall work without the use of External Power Supplies.		
G. 16 AWG Speaker Cable				
Sl. No.	Parameter	Technical Specifications	Compliance (Yes/No)	Deviations
I	Cable	Supply, Installation, Testing and Commissioning of 200 meters 2 Core Speaker cable. It shall be 16 AWG or better. It shall be from the below makes only: Kramer, Extron, Beldon, nT, MX, Falcon.		
H. Professional Grade Microphone System				
Sl. No.	Parameter	Technical Specifications	Compliance (Yes/No)	Deviations
I	Central Control Unit	Central control unit with integrated PC, control software package and digital processor is required for the connectivity of the Chairman and Delegate Units as stated above and shall form the hub of a digital discussion system. The central control unit shall supply power and control data through a standard CAT 5 cable for controlling up to 40 discussion units further expandable up to 400 units through additional power supply. The integrated control software shall be able to be controlled using the intuitive front panel display using multifunction control keys. Alternatively, the software can be accessed by connecting a standard VGA monitor, keyboard and mouse over the unit itself. The integrated software shall allow fault monitoring and error diagnostics and full control over all delegate stations and the audio and conference parameters including equalization, feedback suppression, microphone limiting, and conference modes. An Ethernet port shall also be present on the unit for network connection and control through third party digital control systems (Crestron, AMX, etc.). USB recording capability shall be provided for the conferencing program audio (The recording format shall be either mp3 or wma and a file shall be made for each participant unit separately). The delegate discussion units connected to the central control unit shall be hot-swappable during a conference. Audio input and output ports shall be present on the unit as electronically balanced XLR connections. Audio frequency response shall be 100Hz to 14kHz. Maximum output level shall be +10dBV with a signal-to-noise ratio of greater than 80dB A-weighted at +18dBV. Total harmonic distortion shall be less than 0.01% A-weighted at +6dBV In and Out. The central control unit shall be housed in a stand-alone desktop housing; rack mounting shall be accomplished using optional rack mounting brackets.		

II.	Central Host Unit	Central digital desktop discussion unit is required for use as a chairperson version for use with a central control unit. This Chairman unit shall connect to the central control unit via the standard Category 5 cabling. The unit shall provide two buttons as control keys to cancel/mute microphones. The unit shall include a gooseneck microphone not less than 14" with a super-cardioid capsule to attenuate all unwanted noise. A 3.5mm headphone output jack shall be present on the units. Twin loudspeakers shall be provided in the unit in a top-mounted orientation. The audio signal path shall include a digital signal processor limiter. Operating voltage shall be 9vDC to 54vDC. Total harmonic distortion shall be a maximum of 0.03% at 50mW/16 Ohms. Operating temperature shall be +10°C to +40°C.		

J. Connecting Cable.

SL No.	Parameter	Technical Specifications	Compliance (Yes/No)	Deviations
I.	Cable	Connecting Cables of 10 meter length for integrating the system. It shall be from the same OEM as that of Wireless Discussion System.		

35. Professional Grade 86 Inches Display with Wall Mount Kit (for Conference Room)

Sl. No.	Parameter	Technical Specifications	Compliance (Yes/No)	Deviations
I.	Screen Size	The Panel size shall be Screen Size of 86 inches.		
II.	Aspect Ratio	It shall have an aspect ratio of 16:9, 4:3 or better.		
III.	Native Resolution	It shall have native resolution of 3840X2160 or more.		
IV.	Brightness	It shall have brightness of 330cd/m2/300cd/m2.		
V.	Static CR	It shall be with static contrast ratio of 1,200:1 or more.		
VI.	Viewing Angle	It shall have viewing angle of 178X178 or more.		
VII.	Input Connectivity	It shall have or more HDMI 2.0 Input, 1 or more USB Port or better.		
VIII.	Connectivity	It shall have Audio-Out (3.5mm) (x1), Coaxial-Out (RCA) (x1).		
IX.	Audio Out	It shall have Speaker output of 12W (x2) (Stereo).		
X.	Control	It shall have RS-232 control port.		
XI.	RJ-45.	It shall have RJ-45 port.		
XII.	Response Time	It shall be 5ms or better.		
XIII.	Hospitality Features	It shall support Hotel Mode, Time Scheduler, Healthcare Headphone Mode, Embedded Content Manager.		
XIV.	Power Consumption	It shall have a typical Power consumption of 310 Watts or less.		
XV.	Accessories	It shall be supplied with Remote controller, Power cord as an included accessory.		
XVI.	Interactivity	Technology Infrared Touch "Touch Points" Writing 10 Points "Touch Points" Touch 20 Points Accuracy ±2mm Response Time <15ms Touch Resolution 32,767 x 32,767 Touch Tools Finger, Stylus, Glove, Opaque Objects		

XVII.	Operating System	System Version Android™ v6.0 CPU RK3399, Dual-Core ARM® Cortex® A72 and Quad Core ARM® Cortex® A53 GPU Mali™ T860 RAM 4GB DDR3 Internal Storage 16GB (eMMC Flash)		

Special Requirements.

I. Only vendor who is able to quote their rates for and delivery of all equipment/machines including civil work will be considered.

II. The system delivery should include installation on turnkey basis with dedicated onsite training to end users for items mentioned from Sl. No.23 to 27 and Sl. No 34 & 35.

III. Warranty for machines/equipment for items mentioned from Sl. No.23 to 27 and Sl. No 34 & 35 must be at least 5 years.

IV. Should also quote rates for CMC/AMC for the next five year after expiry of warranty period for items mentioned from Sl. No.23 to 27 and Sl. No 34 & 35. A firm assurance of manufacturer to be given regarding the supply of spares/ accessories for 5 years after the warranty period.

Scope of Work:

I. The work covered by this specification comprises the Furnishing, supply, installation and commissioning of the facilities. The Contractor/ Agency/ System Integrator will furnish the hall, supply and install the equipment necessary to meet the requirements and provide all labour and materials, whether or not described in full, necessary to produce complete and fully operational systems in accordance with the intent of this document. A comprehensive systems approach to the installation shall be taken. This shall include, but not be limited to; following the architectural concepts where available, implementation of the design of the multimedia systems, careful integration with other facilities. The Contractor/ Agency/ System Integrator must familiarise himself with the site drawings and the scope of the facilities that is required. He should ensure that he is aware of the operational requirements under which the systems and associated facilities are to be installed and used. The installed systems must be in all respects suitable for the purposes for which they are intended.

II. All the furnishing works like False Ceiling, Tiles Fixing, Door, Door Pilling, Table, Chair, Texture Paint/ Wall Paper, Blinds, Cabling, Electric Wiring, Lighting etc. shall responsibility of The Contractor/ Agency/ System Integrator.

III. The scope of work also include to prepare details drawings and submit 4 set in hard copy as well as in soft copy in CAD, PDF format etc. as per requirement of project. The Contractor/ Agency/ System Integrator are allowed to visit the Hall during office working hours from 10.00 A.M. – 4.00 P.M (Except Lunch Hour from 1.00 P.M. to 2.00 P.M.) Only the approved drawings by CIP authority will be eligible for Price Bid.

IV. All clearance from competent authorities to make AV system operational at the time of handover shall be arranged by Contractor/ Agency/ System Integrator. Contractor/ Agency/ System Integrator have to provide experienced engineer for operation & maintenance during Warranty period of three years starting from date of handover of works

V. This document specifies the furnishing, installing, testing and commissioning of complete audio-visual equipment's

Section-V

Technical Specification for Advanced Hardware and Software for fMRI

1. **In-Room Viewing Device Ultra High Definition (UHD):** 40" 4K UHD In room Viewing Device for both clinical fMRI users and advanced scientific applications

a. MR Compatible high definition 40" UHD display.

b. With front-facing camera for patient surveillance and built-in USB hub. With its slim design, high definition 40" display and superior picture quality, the In room Viewing Device is the optimal choice for an easy-to-use alternative to conventional projectors or goggle-based image delivery systems.

c. Front-facing camera for uninterrupted patient surveillance during the examination

d. Built-in USB hub, connecting patient communication and interface devices.

e. Mounted on a low weight, height adjustable mobile foot stand. The height adjustable mobile foot stand should allow easy positioning of the monitor anywhere in the MRI room. The monitor can also be ceiling mounted in future. Can be placed anywhere in the MR Room, as per the operational requirement.

f. The In room Viewing Device should interface seamlessly with stimulus presentation software and Comfort Player for the most streamlined workflow available.

g. Screen Diagonal atleast 40''

h. Pixels atleast 3840 x 2160

i. Contrast ratio should be 5000:1 typ.

j. Refresh rate to be 30Hz@UHD 120Hz@FHD

k. VESA fixation -2x 100x100, D: 400mm, M4

l. Alternative fixation may be 40mm x 300mm, M6

m. Camera to have 640 x 480 MAX with atleast 30fps or more

n. Video Input should be HDMI

2. **Compatible Audio System**

a. MR Compatible Electrostatic Headphones: Head Phone type and Earplug type

b. The Audio System should allow auditory signals from the stimulus presentation PC to enter the scanner room and to be presented to the patient wearing a set of headphones. Communication console should allow the operator to adjust the sounds from the PC and to speak directly to the patient through a built-in microphone.

c. Electrostatic transducers to the headphones to give them detailed sound, replicating even minute details with incredible precision.

d. Designed specifically for fMRI

e. Should provide superior sound quality and increased noise attenuation and provide a more precise audio stimulation to the patient. This yields a more robust BOLD response than traditional pneumatic audio systems.

f. It should be compatible with the user-friendly Communication Console.

g. It should give both research and clinical users' versatile control over auditory stimulus presentation.

h. Acoustic attenuation of external noise- LAeq 20dB frequency response - 100Hz –35kHz*

3. Communication Console: With easy accessible controls, the communication console should offer one-way patient communication and full flexibility of audio settings.

a. It should have with its two input channels with individual volume control, which allows connecting a wide variety of audio devices through standard RCA connectors.

b. The Communication Console should feature a built-in speaker for output feedback or audio from a subject microphone (Subject microphone to be supplied).

c. Connectors input audio in: 4 x RCA, channel 1 & 2, separate R/L microphone input: 1 x mini-jack (line in); patient microphone input: 1 x mini-jack (microphone in).

d. Connectors input audio in: 4 x RCA, channel 1 & 2, separate R/L. Microphone input: 1 x mini-jack (line in); Patient microphone input: 1 x mini-jack (microphone in) output audio out: 2 x RCA, separate R/L headphones output: 1 x mini-jack; patient microphone output: 1 x mini-jack

e. Electric supply voltage should be 15 VDC, + on center pin

f. Audio input impedance to be15 kΩ; maximum input level should be 2.8 V; maximum output level should be 2.8 V

g. Audio out: 2 x RCA, separate R/L; headphones output: 1 x mini-jack; patient microphone output: 1 x mini-jack

h. Audio to be input impedance 15 kΩ; maximum input level 2.8 V; maximum output level 2.8 V

4. **Fibre Optic Response Grip:** Two circular Grips, 2 buttons on each grip.

a. The system should consist of two grips, the Response Grip Interface Unit, and fibre-optic cables.

b. The grip should be 100% fibre-optic and should connect to the Response Grip Interface Unit in the operator room through an available wave guide. The Interface Unit should provide real-time feedback of subject responses via LED indicators and optional sound signaling.

c. The Response Grip should be MRI-compatible subject response device developed for both clinical and research users. It should collect patient responses during an fMRI study.

d. The Response Grip consists of two hand-held grips with two buttons each. By pressing the buttons, the patient should be able to respond to the presented stimulus.

e. The Response Grip should be connected to an optical-electrical adapter which converts light to electrical signals. The electrical signal is fed to the Stimulus PC by using standard PC communication interfaces.

f. Ergonomically designed for use in either hand, the Response Grip should be suitable for a wide range of experimental paradigms. The Response Grip should be compatible with all leading software packages.

g. 2 + 2 Length- 31 meters (handles + extension bundle) output

h. USB: mini-B USB. Emulated keyboard (HID)

i. RJ-45: for parallel port or serial adapter cable

5. Sync Box

a. The Sync Box should be connected directly to the MRI scanner where it receives timing pulses sent out with each image series and demodulates this signal before it's forwarded to the stimulus PC. In this way one can ensure that the stimulus presentation software is synchronized with the MRI image recordings.

b. With a flexible and user-friendly menu system, the Sync Box should allow the user to select how the trigger pulse from the MRI scanner is transferred to the software presenting the stimuli.

c. It should be compatible with the leading software packages, should provide an easy-to-use solution for accurate control over stimulus presentation and easy access to timing information for data analysis.

d. The SyncBox should also simulate the trigger signals produced by the scanner during an MRI sequence. This enables the user to develop and test the entire experimental paradigm in the office, minimizing the need for testing in a costly scanning environment

e. Both research projects and clinical testing should benefit from the added accuracy provided by this synchronization device. The SyncBox should interface with a variety of external devices, allowing synchronization of signals from different hardware sources and providing accurate logging of time stamps.

f. The SyncBox should interface seamlessly stimulus presentation software and Response Grip for subject feedback, creating the most streamlined workflow available.

g. Connectors: Input- Philips-Trigger: BNC, female, TTL level

h. Siemens-Trigger: HFBR-female, optical

i. GE-Trigger: 9 pin DSUB, RS-485/422

j. Output: serial Port: 9 pin DSUB, RS-232

k. USB: mini-B USB. For emulated keyboard (HID) or serial port.

l. RJ-45: for parallel port adapter cable

6. Paradigm Presentation Software: A stimulus presentation and workflow software which controls the presentation of stimuli during fMRI examination. It should be designed specifically with the clinical user in mind.

a. It should offer a collection of ready-to-use standard clinical paradigms, allowing physicians to test perceptual, motor and cognitive functions in clinical settings.

b. It should include a choice of pre-defined paradigms, some of which are available in multiple languages. Paradigms can also be modified based on user preferences, and there is an option to build a tailored library of paradigms.

c. Support audio and video files.

d. A single technician should be able to handle stimulus presentation and image acquisition at the same time. With an intuitive interface and detailed easy-to-understand instructions available in multiple languages, the user is guided step-by-step through the process of presenting stimuli during image acquisition.

e. It should run seamlessly with the NNL fMRI hardware, displaying the paradigm to the patient during the MR imaging exam.

f. It is also possible to integrate software with the Philips Ingenia/Siemens Numaris platform (version 4) on the MR console. This way stimulus presentation can be controlled directly from the operating console.
g. Windows PC with dual display port required.

7. **E-Prime 3.0 or latest** : E-Prime 3.0 Single-User License

a. (1) Installation USB; (1) HASP License USB; (3) Years of Silver Support
b. Button sub-object for response collection
i. Choice and Slider sub-objects for surveys and recalls, Slide Layout Templates for quick design
ii. Online Experiment Library, Auto-generate text data files with columns of interest, Interactively run List rows for runtime or debug, Create conditional Task Events using subroutines, Find and replace object properties in experiment., Start experiment from any List object, Run an experiment in floating window for debug, Improved audio/video playback and load time, Runtime support for tablet and touchscreens, New Task Events, Improved user interface
iii. Online Documentation
c. Resources for Users
i. Online Experiment Library
ii. Technical support
iii. Knowledge Base and Documentation
iv. Samples and Tutorials
v. User Forum
vi. How to Videos
vii. Webinars and trainings
d. E-Prime® should allow sending and receiving triggers with external devices, including: EEG/ERP; TMS; fNIRS; Eye Tracking; fMRI; ECG; MEG; Galvanic Skin Response; Tactile Response; Olfactory; Gustatory; EMG; Pneumograph; Shock etc.
e. Design complete experiments without programming
f. Drag and drop objects to build experiments
g. Design with text, images, movies, sounds, sliders, multiple choice, buttons
h. Present performance feedback without script
i. Use pre-built experiments and templates
j. Choose between varieties of sampling methods.
k. Present experiments on multiple monitors
l. Record participant vocalizations
m. Find and replace property values
n. Choose preferred amount of data logging
o. Create more advanced designs with scripting
p. Share common experiment operations using package files.
q. Test at faster speeds with auto response
r. Run in a floating window with real-time debugging
s. Review Advisor Report to identify experiment design issues
t. Start an experiment from any List for quicker debugging.
u. Millisecond accurate stimulus presentation and response times
v. Use event or cumulative timing mode
w. Avoid response latencies from input devices by using Chronos®
x. Extensive timing data reports available online.
y. Connect to Chronos for intuitive digital or analog communication
z. Send triggers and markers without script using Task Events
aa. Send and receive triggers and markers via socket, serial, or parallel port
bb. Create drag and drop package calls with Package File Editor
cc. Communicate with joysticks using X/Y coordinates and buttons.
dd. Data available in E-Data Aid format as well as .TXT

ee. Save preferred data layout for each experiment
ff. Merge participant and session data files into one file
gg. Be aware of data that has been edited
hh. Perform descriptive analyses and auto-generate Excel plots and tables
ii. Export data for inferential statistics in SPSS, R, and Excel.

Special Requirements

- Only vendor who is able to quote and deliver all equipment/machines will be considered.
- The system delivery should include installation on turnkey basis with dedicated onsite training to end users by the authorized representatives from the principal manufacturers.
- Warranty must be 5 years.
- Should also quote for CMC / AMC for the next five years. A firm assurance of manufacturer to be given regarding the supply of spares/ accessories for 5 years after the warranty period.

Section-V

Technical Specification for Automated Elisa Analyzer

1. **System**
   I. Benchtop Automated Elisa System which is capable of processing assays in Micro plates and are extremely versatile, offering totally automated processing of pipetting, washing, shaking, incubation and reading without any user intervention.
   II. The System should be ideal for laboratories involved in clinical infectious disease screening, virus screening, torch panel screening, tumor markers, Hormones and autoimmune antibody testing from Human Serum Plasma Samples.
   III. Number of Test Plates: 4 Nos. 96 well Microplates
2. **Reader**
   I. Wavelength Range – 340-750
   II. Measuring Range – 0 - 3.5(Approx.)
   III. Assay- End Point, Curve-Fit, Kinetics, Quantitative Method
3. **Washer**
   I. Manifold Type 8 well washer
   II. Manifold Needles 8-way dispensing channels & 8-way aspiration channels
4. **Safety Features**
   I. Multiple Liquid Detection, Colour Monitoring Check, Clot Detection
   II. Password Protection
   III. Storable Program and Result
   IV. Barcode Reading Facility
5. **The system should comply with ISO/CE standards and quality.**
6. **The Machine should be a reputed make, it should have 2 years good past record of functioning in Central Government/State Government Medical Institutions**
7. **The system should be supplied with all standard accessories and instruction amnual**
8. **The system delivery should include installation on turnkey basis with dedicated onsite training to end users by the authorized representatives from the principal manufacturers.**
9. **Warranty must be 5 year.**
10. **Should also quote for CMC / AMC for the next five years. A firm assurance of manufacturer to be given regarding the supply of spares/ accessories for 5 years after the warranty period.**

Section-V

Technical Specification for Furnishing, supply, installation, testing, commissioning of Audio Visual system at B.Hill Hall of Teaching block of this institute.

Scope of Work & Instructions For Technical Bid

- **Scope of Work: -**The work covered by this specification comprises the Furnishing, supply, installation and commissioning of the facilities. The Contractor/ Agency/ System Integrator will furnish the hall, supply and install the equipment necessary to meet the requirements and provide all labour and materials, whether or not described in full, necessary to produce complete and fully operational systems in accordance with the intent of this document. A comprehensive systems approach to the installation shall be taken. This shall include, but not be limited to; following the architectural concepts where available, implementation of the design of the multimedia systems, careful integration with other facilities. The Contractor/ Agency/ System Integrator must familiarise himself with the site drawings and the scope of the facilities that is required. He should ensure that he is aware of the operational requirements under which the systems and associated facilities are to be installed and used. The installed systems must be in all respects suitable for the purposes for which they are intended.
- All the furnishing works like False Ceiling, Tiles Fixing, Door, Door Pilling, Table, Chair, Texture Paint/ Wall Paper, Blinds, Cabling, Electric Wiring, Lighting etc. shall responsibility of The Contractor/ Agency/ System Integrator.
- The scope of work also include to prepare details drawings and submit 4 set in hard copy as well as in soft copy in CAD, PDF format etc. as per requirement of project. The Contractor/ Agency/ System Integrator are allowed to visit the Hall during office working hours from 10.00 A.M. – 4.00 P.M (Except Lunch Hour from 1.00 P.M. to 2.00 P.M.) Only the approved drawings by CIP authority will be eligible for Price Bid.
- All clearance from competent authorities to make AV system operational at the time of handover shall be arranged by Contractor/ Agency/ System Integrator. Contractor/ Agency/ System Integrator have to provide experienced engineer for operation & maintenance during Warranty period of three years starting from date of handover of works
- This document specifies the furnishing, installing, testing and commissioning of complete audio-visual equipment's at upcoming new facility at B.hill Hall of Teaching block of this institute.
- **AV System Functionality & Scope**

- Presentation Capturing System with 2 TB Storage for session
- PTZ Camera with Multi Video Ports and 20X Optical Zoom for audience. Can be used for Unified communications also.
- PTZ Camera with Multi Video Ports and 12X Optical Zoom for stage. Can be used for Unified communications also.
- Wired Gooseneck Microphone for Podium
- 2 Nos. High Quality Wireless Handheld Microphone
- 2 Nos. High Quality Wireless Lapel Microphone
- Wireless Switching and AV Transmission Facility
- Room Automation through Wireless Touch Panel while achieving multi source Video Switching, Audio Mixing and System Control.
- High Quality Sound reinforcement system with Subwoofers and Multi-Channel Amplifiers.
- 86 Inches Ultra HD Display facility.
- Podium on Stage with 21.5 Inches Touch Screen Monitor with Hydraulic Lift.
- Digital Signal Processor for Complete Audio System Control
- Industrial Grade CPU to be placed inside Podium

The list of items required for Furnishing, supply, installation, testing, commissioning of Audio Visual system at B.Hill hall at Teaching Block of Institute

Sr.No.	Item Description	Qty.	Unit Basic Price	GST	Total with GST
1	Professional Grade PTZ Camera with 12X Optical Zoom and multi- Port Connectivity. Focusing on Stage	1			
2	Professional Grade PTZ Camera with 20X Optical Zoom and multi-Port Connectivity. Focusing on Audience	1			
3	Presentation capturing System with 2 TB recording Storage Space	1			
4	Professional Grade wireless AV transmission gateway with Four cross one switching System	1			
5	Professional Grade All In One Control System with Digital Switching, Audio Mixing and Control.	1			
6	Professional Grade Metallic Podium with Rack Space for Equipment.	1			
7	Professional Grade 21.5 Inches Touch Screen Monitor	1			
8	Professional Grade Wired Gooseneck Microphone.	1			
9	Professional Grade Wireless Lapel Microphone	1			
10	Professional Grade Wireless Handheld Microphone	2			
11	Professional Grade Point Source Speaker with OEM Bracket	4			
12	Professional Grade Subwoofer	1			
13	Professional Grade Multi Channel Amplifier for Point Sources	1			
14	Professional Grade Multi Channel Amplifier for Subwoofers	1			
15	Professional Grade Digital Signal processor	1			
16	Industrial Grade CPU with Digital Signal Processor for Unified Applications	1			
17	Professional Grade 86 Inches with Wall Mount Kit.	1			
18	Professional Grade 20 meters USB 3.0 Active Optical Cable	2			
19	Professional Grade 20 meters HDMI 2.0 Active Optical Cable	4			
20	Professional Grade 5 meters HDMI Patch Cords	4			
21	16 AWG Speaker Cable (In 100 Meters)	2			
22	2 Core Shielded Audio Cable/Control Cable (In 100 Meters)	1			
23	3 Core Power Cable (50 Meters)	1			
24	Professional Grade Microphone system with Central Control unit with gooseneck Microphone	1			
25	Professional Grade Client Unit with Gooseneck Microphone (One for Two seating)	1			
26	10 meters Connecting Cable for Discussion Units with Control Unit	1			
27	False ceiling: 12mm Thick Gypsum Board will be hang on GI Channel Gap will be filled with fiber tape and final finished with Compound. With Pilling	2000 Sqft.			
28	Wooden Tiles Fixing on stage	250 Sqft.			
29	Window Curtain blinds	162 Sqft.			
30	Door- 32 mm thick flush door, with 1mm thick laminate, 18" handle of both sides.	32 Sqft.			

31	Door Pilling	30 Sqft.			
32	Table will be made of 19 mm & 12 mm thick pine wood ply with gurjan core finish, there will be two drawers in both end of the table, inside of the table will be finished with Liner laminate & upper side of table finished with Glass Top. There will be an electrical switch inside the table for power output for multi uses and LAN Connectivity	48 Sqft.			
33	Executive Chair	7 Nos.			
34	Wall Paper on one wall and Texture on rest 3 remaining Wall	1250 Sqft.			
35	wooden cupboard (Design: Customized) 54sqft* 2	108 Sqft.			
36	12Watt LED Bulb	10 Nos.			
37	24 Watt LED Bulb	16 Nos.			
38	Celling Mounted Fan Power: 75 watts	12 Nos.			
39	Installation Of the system	1 Lot			

Technical Specification of items required for Furnishing, supply, installation, testing, commissioning of Audio Visual system at B.Hill hall at Teaching Block of Institute

Technical Specifications				
1. PTZ Camera with 12X Optical Zoom				
Sr.No	**Parameter**	**Technical Specifications**	**Compliance (Yes/No)**	**Deviations**
I.	Sensor	The camera shall have 1/2.5 inch high quality 3.1MP HD CMOS sensor or better.		
II.	White Balance	It shall have an option of Auto or Manual White Balance.		
III.	S/N ratio	It shall have S/N Ratio of >50db.		
IV.	Optical Zoom	It shall have 12x optical zoom or better.		
V.	Digital Zoom	It shall have 2x digital zoom or better.		
VI.	Interface	It shall have USB 3.0 port for unified communication applications, HDMI/DVI Port for Hardware Equipments, 3G-SDI Port for Broadcasting Devices. All the Ports shall work simultaneously so that the same camera can be used for different applications while using different types of cables.		
VII.	Network Interface	It shall have RJ-45 network interface for Monitoring applications.		
VIII.	Signal Support	It shall support Video format of 1080p 60/50/30/25 fps, 720p 60/50/30/25 fps.		
IX.	Frames Per Second	It shall support 60 fps or better.		
X.	Control Port	It shall have an RS 232 port as well s RS-422/485 Port for Communication.		
XI.	Presets	It shall have at least 128 Position Presets through RS-232 and atleast 9 position presets through IR remote or better.		
XII.	Field Of View	It shall have 72.5 Degree or better field of view.		
XIII.	Pan Range	It shall have a Pan Rotation Angle of -169 degrees to +169 degrees or better.		

XIV.	Tilt Range	It shall have a Tilt Rotation Angle of -30 degrees to + 70 degrees or better.		
XV.	Accessory	It shall be supplied with IR remote control, Control Cable, Mounting bracket and 3 Meters Camera Cable as an included accessory.		
2. PTZ Camera with 20X Optical Zoom				
Sr. No	**Parameter**	**Technical Specifications**	**Compliance (Yes/No)**	**Deviations**
I.	Sensor	The camera shall have 1/2.5 inch high quality 3.5MP HD CMOS sensor or better.		
II.	White Balance	It shall have an option of Auto or Manual White Balance.		
III.	S/N ratio	It shall have S/N Ratio of >50db.		
IV.	Optical Zoom	It shall have 20x optical zoom or better.		
V.	Digital Zoom	It shall have 2x digital zoom or better.		
VI.	Interface	It shall have USB 3.0 port for unified communication applications, HDMI/DVI Port for Hardware Equipments, 3G-SDI Port for Broadcasting Devices. All the Ports shall work simultaneously so that the same camera can be used for different applications while using different types of cables.		
VII.	Network Interface	It shall have RJ-45 network interface for Monitoring applications.		
VIII.	Signal Support	It shall support Video format of 1080p 60/50/30/25 fps, 720p 60/50/30/25 fps.		
IX.	Frames Per Second	It shall support 60 fps or better.		
X.	Control Port	It shall have an RS 232 port as well s RS-422/485 Port for Communication.		
XI.	Presets	It shall have at least 128 Position Presets through RS-232 and atleast 9 position presets through IR remote or better.		
XII.	Field Of View	It shall have 60.5 Degree or better field of view.		
XIII.	Pan Range	It shall have a Pan Rotation Angle of -169 degrees to +169 degrees or better.		
XIV.	Tilt Range	It shall have a Tilt Rotation Angle of -30 degrees to + 70 degrees or better.		
XV.	Accessory	It shall be supplied with IR remote control, Control Cable, Mounting bracket and 3 Meters Camera Cable as an included accessory.		
3. Presentation Capturing System				
S. No	**Parameter**	**Technical Specifications**	**Compliance (Yes/No)**	**Deviations**
I.	Video	The Appliance should support the following video standards H.264 or more. It shall be expandable to Six Videos in future with license upgrade.		
II.	Audio Codec	It shall support AAC-LD or better.		
III.	Aspect Ratio	It shall support 16:9 aspect ratio.		
IV.	Video Inputs	It shall have 2 or more HDMI/DVI/3G-SDI or combination of these as an input.		

V.	Presentation Input Port	It shall have at least 1 DVI-I/HDMI input for connecting Laptops/CPUs.		
VI.	Video Output	It shall be able to give Two full high definition outputs at Sixty frames per seconds with Full High Definition Camera feeds from one Output and Content from the second output.		
VII.	Audio Inputs	It should have at least 2 Audio inputs		
VIII.	Audio Output	It should have at least 2 Audio outputs.		
IX.	Resolution supported	It should support Resolutions of 1080p, 720p or more.		
X.	Audio	It should support Acoustic Echo Cancellation, Automatic Gain Control, and Acoustic Noise Suppression.		
XI.	Address Book	It should support 1000 Local Address Book or better.		
XII.	Network	It should have minimum 1 RJ-45 port for IP network. It should support TCP/IP, DHCP.		
XIII.	Bandwidth Support	It shall support up to 8 Mbps or more bandwidth.		
XIV.	Security	It should support AES signaling and media stream encryption.		
XV.	Recording	It shall be supplied with internal recording server with High definition recording or an external recording server is to be supplied with this device for local session recording. It shall be supplied with 2 TB storage spaces having high speed data transfer port of USB 3.0/HDMI 2.0 or better.		

4. Professional Grade AV Transmission Gateway

S. No	Parameter	Technical Specifications	Compliance (Yes/No)	Deviations
I.	System	It shall consist of One AV Gateway Unit with Four USB 2.0 based or better Wireless Transmitters.		
II.	Scalability	It shall be scalable to support Twenty Eight or more Transmission units.		
III.	Bandwidth	It shall have a communication bandwidth of Three Hundred mbps or more.		
IV.	Signal Transmission	It shall support signal transmission between Gateway Receiver and Transmitter up to Thirty Five meters or better.		
V.	Integration	It shall get integrated with the calling device.		
VI.	Annotation	It shall be able to send and receive annotation controls wirelessly when an interactive device is connected to the gateway data output.		
VII.	Platforms	It shall support platforms like iPad, iOS, Mac, Windows or more.		
VIII.	Resolutions	It shall support Full HD or HD or more resolutions.		
IX.	Switching	This along with the Transmitters shall work as wireless 4x1 switching system and shall give access to the latest Wireless Transmitter whose transmission switch is put to Momentary Close Circuit State.		
X.	Video Interface	It shall have HDMI Output Interface for Video and Audio.		
XI.	Audio Interface	It shall have 3.5mm Setero Audio Interface or better.		
XII.	Data Interface	It shall have at least 1 USB 2.0 Port and at least 1 USB 3.0 Port.		

XIII.	Network Interface	It shall have RJ-45 Interface for Wired Network and WLAN for connecting to wireless networks.		
5. Professional Grade All In One Control System with Digital Switching, Audio Mixing and Control.				
Sr.No	**Parameter**	**Technical Specifications**	**Compliance (Yes/No)**	**Deviations**
I.	System	It shall be Multimedia Switching System, with inbuilt microphone mixer, inbuilt audio Digital signal Processor with AEC, Amplifier and control system in one single Unit.		
II.	Signal Routing	It shall support matrix signal routing of Seven Video Inputs to Four Video Outputs.		
III.	HD BaseT	It shall be HD BaseT certified so that it can support all the third party HDBaseT devices.		
IV.	Digital Signals	It shall be able to support HDMI, DVI, DisplayPort Multimode, HDBaseT and SPDIF digital sources or better.		
V.	Analog Signals	It shall be able to support RGB, composite, S-Video, component, and stereo audio analog sources.		
VI.	Auto Mode	It shall support auto-detecting, auto-switching inputs for all types of video and audio sources.		
	Microphone Input	It shall have built-in 6-channel gated microphone mixing with acoustic echo cancellation on each microphone input.		
VII.	Audio DSP	It shall support audio signal mixing and routing to atleast 6 separate outputs. It shall support HDMI audio signal embedding as well as de-embedding.		
VIII.	Amplification	It shall have built-in 40 Watt amplifier which can be selected as 8 Ohm stereo or 70/100 Volt mono amplifier when required.		
IX.	EDID Management	It shall perform automatic AV signal format management via EDID .		
X.	Ethernet Switch	It shall have integrated Ethernet switch which shall provide single-point LAN connection.		
XI.	Application Support	It shall have iPhone, and iPad control application support.		
XII.	Two Way Control Ports	It shall have at least Two Numbers of Two Way RS-232 ports.		
XIII.	One Way Control ports	It shall have atleast Four Hybrid Control Ports which shall act as IR out control port or One way RS-232 Control Port.		
XIV.	Relay Ports	It shall have atleast Four nos normally open, isolated relay ports which shall be Rated 1 Amp, 30 Volts AC/DC.		
XV.	Two Way Control Ports	It shall have atleast Four Nos Four Pin Control Ports.		
XVI.	IR and USB	It shall have atleast 1 IR input port. It shall have one or more USB ports.		
XVII.	Video Input Ports	It shall have atleast 5 or more HDMI or equivalent ports. It shall have atleast two HDBaseT or equivalent Ports.		
XVIII.	Video Outputs	It shall have atleast 2 HDMI or equivalent outputs and atleast 2 HD Base or equivalent outputs.		
XIX.	Matrix Switcher.	It shall have 7X4 Matrix Switcher with auto detecting Multi Format analog/Digital Video Inputs.		

XX.	Progressive Resolution Support	It shall support the progressive resolution of 720x480@60Hz (480p), 720x576@50Hz (576p), 848x480@60Hz, 852x480@60Hz, 854x480@60Hz, 11024x852@60Hz, 1024x1024@60Hz, 1280x720@50Hz (720p50), 1280x720@60Hz (720p60), 1280x768@60Hz, 1280x800@60Hz,1366x768@60Hz, 1440x900@60Hz, 1600x900@60Hz, 1680x1050@60Hz, 1080p24, (1080p25), 1080p50, 1920x1080@60Hz, 1920x1200@60Hz, 2048x1080@24Hz, 2048x1152@60Hz or more.		
XXI.	Interlaced Resolution Support	It shall support the interlaced resolution of720x480@30Hz, 720x576@25Hz, 1920x1080@25Hz, 1920x1080@30Hz or better.		
XXII.	Component resolution Support	It shall support component resolutions of 480i, 576i, 480p, 576p, 720p50, 720p60, 1080p24, 1080i25 (1125 lines), 1080i30, 1080p30, 1080p50 (1125 lines), 1080p60.		
XXIII.	Video/Audio	It shall have 6-channel gated mic mixer Digital signal processing with AEC, auto detecting multi-format digital/analog source inputs, HD BaseT compatible inputs, 7x12 or better stereo source switcher, 7x4 multichannel source switcher, analog and HDMI outputs, HDBaseT compatible outputs with independent Six Channel Microphone and source mixer per output, independent Digital Signal Processor per analog output, dedicated AEC reference mixer and DSP along with digital audio pass-through mode		
XXIV.	System	It shall be Multimedi receiver and display controller which shall connect to the central control system.		
XXV.	Output	It shall have atleast 1 HDMI Output.		
XXVI.	HD BaseT	It shall be HD BaseT certified so that it can support all the third party HD BaseT devices.		
XXVII.	HDCP	It shall be HDCP 2.2 compliant or better.		
XVIII.	Analog Signals	It shall be able to support RGB, composite, S-Video, component, and stereo audio analog sources.		
XXIX.	Resolution	It shall support resolutions upto 4K and UHD.		
XXX.	Ethernet	It shall have 1 or more Ethernet LAN Port. And one RJ-45 Port which shall support HDBaseT.		
XXXI.	Two Way Control Ports	It shall have atleast one Numbers of Two Way RS-232 ports.		
XXXII.	One Way Control ports	It shall have atleast two IR Ports.		
6. Professional Grade Metallic Podium				
Sr. No	**Parameter**	**Technical Specifications**	**Compliance (Yes/No)**	**Deviations**
I.	Body	The Podium body shall be Metal.		
II.	Top	The Top Shall be Sliding for Equipment Protection and Shall be Lockable.		
III.	Lift	It shall have space and Electronic lift for 22 inches Touch Screen Monitor.		
IV.	Port	The Podium Shall have Female XLR Port on one side to accommodate Gooseneck Microphone.		

V.	Power Extension	The Podium sall be supplied with 2 nos High Quality 6 Socket Power Extension Board.		
7. 21.5 Inches Touch Screen Monitor				
Sr. No	**Parameter**	**Technical Specifications**	**Compliance (Yes/No)**	**Deviations**
I.	Size	It shall be 21.5 inches or more Touch Screen monitor.		
II.	Type	The monitor shall be LED backlit.		
III.	Resolution	The monitor shall have native resolution of 1920 x 1080 or better.		
IV.	Brightness	The monitor shall have of 250 cd/m^2 or more brightness.		
V.	Port	The monitor shall have 15 Pin HD ports and DVI/HDMI Input port.		
VI.	Touch	The monitor shall be Finger Touch or Pen Touch.		
VII.	Power	The monitor shall support Power Supply of 100 ~ 250VAC.		
8. Professional Grade Wired Microphone				
Sr. No	**Parameter**	**Technical Specifications**	**Compliance (Yes/No)**	**Deviations**
I.	Transducer	It shall be pre polarized Condenser Microphone.		
II.	Acoustics	It shall have cardioid Pickup Pattern.		
III.	Frequency Response	It shall have frequency response of 50Hz to 20000 Hz or better.		
IV.	SPL	It shall have maximum 130 dB SPL or better.		
V.	Equivalnt Noise Level	It shall have equivalent noise level of 26dB or better		
VI.	Phantom Power	It shall operate from an external 12V to 48V DC phantom power source; current consumption shall be 3 mA.		
VII.	Connectivity	It shall have XLR connectivity.		
9. Professional Grade Wireless Lapel Microphone				
Sr.No	**Parameter**	**Technical Specifications**	**Compliance (Yes/No)**	**Deviations**
I.	Modulation	It shall have Wideband Frequency Modulation.		
II.	S/N Ratio	It shall have a S/N ratio of ≥ 103 dBA or better.		
III.	Frequencies	It shall have atleast 8 frequency banks, each with up to 10 or more factory-preset channels		
IV.	THD	It shall have a THD of ≤ 0.9% or better.		
V.	Sensitivity	It shall have a sensitivity of < 3 µV at 52 dB(A)rms S/N or better		
VI.	Frequency Response	It shall have a frequency response of 50 to 16,000 Hz (–3 dB) or better.		
VII.	Audio Adjustment Range	It shall have an audio adjustment range of 40 dB, adjustable in 5-dB steps or better.		
VIII.	Squelch	It shall have a Squelch Control adjustable from 3 dBµV to 28 dBµV or better.		
IX.	Line/Mic Level	It shall have a Mic/Line level of 20 dB and switchable.		
X.	Operating Time	The Microphones shall have an Operating Time of 9 Hours or more.		
XI.	Pick Up Pattern	It shall have a Omni-Directional pickup Pattern.		

XII.	Input Sensitivity	It shall have an input sensitivity of 20 mV/Pa or better.		
XIII.	Accessories	It shall be supplied as 1 receiver, 1 bodypack transmitter, 1 lavalier Microphone, 1 power supply, 2 AA batteries, 1 rackmount kit, 1 pouch and user manual complete in all respect.		
10. Professional Grade Wireless Handheld Microphone				
Sr.No	**Parameter**	**Technical Specifications**	**Compliance (Yes/No)**	**Deviations**
I.	Modulation	It shall have Wideband Frequency Modulation.		
II.	S/N Ratio	It shall have a S/N ratio of ≥ 103 dBA or better.		
III.	Frequencies	It shall have atleast 8 frequency banks, each with up to 10 or more factory-preset channels		
IV.	THD	It shall have a THD of ≤ 0.9% or better.		
V.	Sensitivity	It shall have a sensitivity of < 3 µV at 52 dB(A)rms S/N or better		
VI.	Frequency Response	It shall have a frequency response of 50 to 16,000 Hz (–3 dB) or better.		
VII.	Audio Adjustment Range	It shall have an audio adjustment range of 40 dB, adjustable in 5-dB steps or better.		
VIII.	Squelch	It shall have a Squelch Control adjustable from 3 dBµV to 28 dBµV or better.		
IX.	Line/Mic Level	It shall have a Mic/Line level of 20 dB and switchable.		
X.	Operating Time	The Microphones shall have an Operating Time of 9 Hours or more.		
XI.	Pick Up Pattern	It shall have a Cardioid pickup Pattern.		
XII.	Input Sensitivity	It shall have an input sensitivity of 1.5 mV/Pa or better.		
XIII.	Accessories	It shall be supplied as 1 receiver, 1 handheld transmitter, 1 microphone clamp, 1 power supply, 2 AA batteries, 1 rackmount kit, 1 pouch and user manual complete in all respect.		
11. Professional Grade Point Source Speaker with Bracket				
Sr. No	**Parameter**	**Technical Specifications**	**Compliance (Yes/No)**	**Deviations**
I.	Audio	Supply, Installation, Testing and Commissioning of Loudspeakers with Drivers 2x 10" LF or 1x 15inch / 1 x 1,4" HF Coaxial , Frequency range 60 - 18K Hz; Power capacity program / peak:1000/2000W ; Impedance- 8 Ohm , Coverage range (h x v) 60° x 40°/90° x 50°, rotatable HF-Horn; Sensitivity 1 W / 1 m - 106 dB,SPL max / peak 138 dB,		
12. Professional Grade Subwoofer				
Sr.No	**Parameter**	**Technical Specifications**	**Compliance (Yes/No)**	**Deviations**
I.	Sub	SITC of compact Subwoofer 1x 14" LF or 1x15" ; Frequency range 39 - 120 Hz, Power capacity-programme / peak: 1400 / 2800 W ; Impedance - 8Ohm , Sensitivity 1 W / 1 m - 93dB; Passive ; SPLmax peak 126dB		

13. Professional Grade Amplifier for Point Sources				
Sr. No	**Parameter**	**Technical Specifications**	**Compliance (Yes/No)**	**Deviations**
I.	Amplification	SITC of Four Channel amplifier with inbuilt DSP, 1500W @2ohm , 1200W @4 ohm; 1200W @8ohm and 3000W @4Ohm and 2400W@8Ohm in bridge mode; Maximum output voltage 140Vpeak and 45Apeak current; Frequency Response 20Hz-20KHz;S/N Ratio- 110dBA; Crosstalk >70dB@1Khz;THD+N < 0.2%; Slew Rate->50V/micro Sec; Damping Factor >500@ 20-100Hz; A/D and D/A Converters of 24bit/48KHz; DSP Inbuilt Preset Memory; Crossover Filters - linear phase (FIR), Butterworth, Linkwitz-Riley, Bessel: 6 dB/oct to 48 dB/oct (IIR);Input Equalizers - Raised-cosine, custom FiR, parametric iiR: peaking, hi/lo-shelving, all-pass, band-pass, band-stop, hi/lo-pass; Output Equalizer ; Limiters - P True Power™, RMS voltage, RMS current, Peak limiter; Audio signal input 1 x 12 pin Phoenix MC 1.5/12-ST-3.81 - Signal input – MAIN; Loudspeakers 1 x 8 pin Phoenix DFK-PC 4/8-G-7.62 - Signal output; Network/data 1 x USB plug -speakers presets, separate input and output DSP.		
14. Professional Grade Amplifier for Subs				
Sr. No	**Parameter**	**Technical Specifications**	**Compliance (Yes/No)**	**Deviations**
I.	Amplification	SITC of two Channel amplifier with inbuilt DSP, 3000W @2ohm , 2400W @4 ohm; 1250W @8ohm ; 6000W @4Ohm and 4800W@8Ohm in bridge mode; Maximum output voltage 142Vpeak and 80Apeak current; Frequency Response 20Hz-20KHz;S/N Ratio- 111dBA; Crosstalk <70dB@1Khz;THD+N < 0.1%; Slew Rate->50V/micro Sec; Damping Factor >500@ 20-100Hz; A/D and D/A Converters of 24bit/48KHz; DSP Inbuilt Preset Memory; Crossover Filters - linear phase (FIR), Butterworth, Linkwitz-Riley, Bessel: 6 dB/oct to 48 dB/oct (IIR);Input Equalizers - Raised-cosine, custom FiR, parametric iiR: peaking, hi/lo-shelving, all-pass, band-pass, band-stop, hi/lo-pass; Output Equalizer ; Limiters - P True Power™, RMS voltage, RMS current, Peak limiter; Signal output; Network/data 1 x USB plug - USB connection and with speakers presets, separate input and output DSP.		
15. Professional Grade Digital Signal Processor				
Sr. No.	**Parameter**	**Technical Specifications**	**Compliance (Yes/No)**	**Deviations**
I.	Mic/Line Inputs	It shall have 8 or more AEC enables Mic /Line Inputs with individual AEC.		
II.	Line Outputs	It shall have 8 or more Outputs		
III.	Processing	It shall have inbuilt noise cancellation, Signal processing, Crossovers, Parametric Equalizer.		
IV.	Line Inputs	It shall have 2 or more Line Inputs		

V.	Control Port	It shall have RS-232 for third party control.		
VI.	Matrix Mixer	It shall have inbuilt matrix mixer		
VII.	USB Audio Port	It shall have USB Audio Port for unified communications.		

16. Industrial Grade CPU

Sr.No	Parameter	Technical Specifications	Compliance (Yes/No)	Deviations
I.	Processor	It shall have Core i5 or better processor		
II.	RAM	It shall have 8 GB or more RAM		
III.	HDD	It shall have 1 TB or more HDD.		
IV.	Video Interface	It shall have at least two HDMI or DP outputs		
V.	Form Factor	It shall have Mini Form Factor		
VI.	USB 3.0	It shall have at least 2 USB 3.0 Ports		
VII.	USB 2.0	It shall have at least 2 USB 2.0 Ports		
VIII.	RJ-45	It shall have at least 1 RJ-45 port		
IX.	AEC	It shall have inbuilt echo cancellation with external Microphone integration or shall be supplied with full duplex DSP with USB Port.		
X.	Keyboard/Mouse	It shall be supplied with wireless Keyboard and Mouse		

17. Professional Grade 86 Inches Display with Wall Mount Kit

Sr.No	Parameter	Technical Specifications	Compliance (Yes/No)	Deviations
I.	Screen Size	The Panel size shall be Screen Size of 86 inches.		
II.	Aspect Ratio	It shall have an aspect ratio of 16:9, 4:3 or better.		
III.	Native Resolution	It shall have native resolution of 3840X2160 or more.		
IV.	Brightness	It shall have brightness of 330cd/m2/300cd/m2.		
V.	Static CR	It shall be with static contrast ratio of 1,200:1 or more.		
VI.	Viewing Angle	It shall have viewing angle of 178X178 or more.		
VII.	Input Connectivity	It shall have or more HDMI 2.0 Input, 1 or more USB Port or better.		
VIII.	Connectivity	It shall have Audio-Out (3.5mm) (x1), Coaxial-Out (RCA) (x1).		
IX.	Audio Out	It shall have Speaker output of 12W (x2) (Stereo).		
X.	Control	It shall have RS-232 control port.		
XI.	RJ-45.	It shall have RJ-45 port.		
XII.	Response Time	It shall be 5ms or better.		
XIII.	Hospitality Features	It shall support Hotel Mode, Time Scheduler, Healthcare Headphone Mode, and Embedded Content Manager.		
XIV.	Power Consumption	It shall have a typical Power consumption of 310 Watts or less.		
XV.	Accessories	It shall be supplied with Remote controller, Power cord as an included accessory.		

XVI.	Interactivity	Technology Infrared Touch "Touch Points" Writing 10 Points "Touch Points" Touch 20 Points Accuracy ±2mm Response Time <15ms Touch Resolution 32,767 x 32,767 Touch Tools Finger, Stylus, Glove, Opaque Objects		
XVII.	Operating System	System Version Android™ v6.0 CPU RK3399, Dual-Core ARM® Cortex® A72 and Quad Core ARM® Cortex® A53 GPU Mali™ T860 RAM 4GB DDR3 Internal Storage 16GB (eMMC Flash)		

18. Professional Grade 20 meters USB 3.0 Active Optical Cable

Sr.no.	Parameter	Technical Specifications	Compliance (Yes/No)	Deviations
I.	Cable Length and Type	20 meters USB 3.0 Active Optical Cable Type A Male to Type A Female.		
II.	Data Rate	It shall support data rate of up to 5 Gbps or better.		
III.	Bend Radius	It shall have a bend radius of 20mm or better.		
IV.	Compatibility	It shall be back compatible with USB 2.0/1.1 or better.		
V.	Power Supply	It shall have an interface for Power Supply.		
VI.	Power Dissipation	It shall have Power Dissipation of .94W or lesser.		
VII.	Signal Transmission	It shall support signal transmission up to 50 meters or better.		
VIII.	Cable OD	It shall have an outer cable diameter of 4mm or less.		
IX.	Version	It shall be USB 3.0 or better.		
X.	Features	It shall be hot pluggable and Anti Jamming.		

19. Professional Grade 20 meters HDMI 2.0 Active Optical Cable

Sr.No.	Parameter	Technical Specifications	Compliance (Yes/No)	Deviations
I.	Cable Length and Type	20 meters HDMI Active Optical Cable Type A to Type A.		
II.	Data Rate	It shall support data rate of up to 18.2 Gbps		
III.	Signal Support	It shall support resolutions of up to 3820x2160@60 Hz or better		
IV.	Power Consumption	It shall have a Power Consumption of 250mV or better.		
V.	Dynamic Bend Radius	It shall have a dynamic bend radius of 80mm or better.		
VI.	Static Bend Radius	It shall have a static bend radius of 40mm or better.		
VII.	Signal Transmission	It shall support lossless signal transmission up to 100 meters or better.		
VIII.	Version	It shall be HDMI 2.0 or better.		
IX.	HDCP	It shall support HDCP 2.2 or better.		

X.	Cable OD	It shall have an outer diameter of 4mm or less.		
XI.	RF & EMI	It shall be highly resistant with RF and EMI interference.		
XII.	External Power Supply	It shall work without the use of External Power Supplies.		

20. Professional Grade 5 meters HDMI Patch Cords

Sr.No.	Parameter	Technical Specifications	Compliance (Yes/No)	Deviations
I.	Cable Length and Type	5 meters HDMI Type A to Type A.		
II.	Data Rate	It shall support data rate of up to 18 Gbps		
III.	Signal Support	It shall support resolutions of up to 3820x2160@60 Hz or better		
IV.	Contacts	It shall have Gold Plated Contacts for Signal Integrity.		
V.	Dynamic Bend Radius	It shall have a dynamic bend radius of 90mm or better.		
VI.	Insulation Resistance	It shall have an insulation resistance of 100 ohms or better.		
VII.	Dielectric Strength	It shall have a Dielectric Strength of 500V/minute or better.		
VIII.	Version	It shall be HDMI 2.0 or better.		
IX.	Frequency	It shall have up to 1536 Khz or better Audio Sample Frequency for highest audio fidelity.		
X.	RF & EMI	It shall be highly resistant with RF and EMI interference.		
	External Power Supply	It shall work without the use of External Power Supplies.		

21. 16 AWG Speaker Cable

Sr.No	Parameter	Technical Specifications	Compliance (Yes/No)	Deviations
I	Cable	Supply, Installation, Testing and Commissioning of 200 meters 2 Core Speaker cable. It shall be 16 AWG or better. It shall be from the below makes only: Kramer, Extron, Beldon, nT, MX, Falcon.		

22. Audio/Control Cable

Sr. No.	Parameter	Technical Specifications	Compliance (Yes/No)	Deviations
I	Cable	Supply, Installation, Testing and Commissioning of 100 meters 2 Core shielded Control cable. It shall be from the below makes only: Kramer, Extron, Belton, nT, MX, Falcon.		

23. Power Cable

Sr.No.	Parameter	Technical Specifications	Compliance (Yes/No)	Deviations
I	Cable	Supply, Installation, Testing and Commissioning of 3 Core Power cable. It should have a 50 meters of length per classroom.		

24. Professional Grade Microphone System				
Sr.No.	**Parameter**	**Technical Specifications**	**Compliance (Yes/No)**	**Deviations**
I	Central Control Unit	Central control unit with integrated PC, control software package and digital processor is required for the connectivity of the Chairman and Delegate Units as stated above and shall form the hub of a digital discussion system. The central control unit shall supply power and control data through a standard CAT 5 cable for controlling up to 40 discussion units further expandable up to 400 units through additional power supply. The integrated control software shall be able to be controlled using the intuitive front panel display using multifunction control keys. Alternatively, the software can be accessed by connecting a standard VGA monitor, keyboard and mouse over the unit itself. The integrated software shall allow fault monitoring and error diagnostics and full control over all delegate stations and the audio and conference parameters including equalization, feedback suppression, microphone limiting, and conference modes. An Ethernet port shall also be present on the unit for network connection and control through third party digital control systems (Crestron, AMX, etc.). USB recording capability shall be provided for the conferencing program audio (The recording format shall be either mp3 or wma and a file shall be made for each participant unit separately). The delegate discussion units connected to the central control unit shall be hot-swappable during a conference. Audio input and output ports shall be present on the unit as electronically balanced XLR connections. Audio frequency response shall be 100Hz to 14kHz. Maximum output level shall be +10dBV with a signal-to-noise ratio of greater than 80dB A-weighted at +18dBV. Total harmonic distortion shall be less than 0.01% A-weighted at +6dBV In and Out. The central control unit shall be housed in a stand-alone desktop housing; rack mounting shall be accomplished using optional rack mounting brackets.		
II	Central Host Unit	Central digital desktop discussion unit is required for use as a chairperson version for use with a central control unit. This Chairman unit shall connect to the central control unit via the standard Category 5 cabling. The unit shall provide two buttons as control keys to cancel/mute microphones. The unit shall include a gooseneck microphone not less than 14" with a super-cardioid capsule to attenuate all unwanted noise. A 3.5mm headphone output jack shall be present on the units. Twin loudspeakers shall be provided in the unit in a top-mounted orientation. The audio signal path shall include a digital signal processor limiter. Operating voltage shall be 9vDC to 54vDC. Total harmonic distortion shall be a maximum of 0.03% at 50mW/16 Ohms. Operating temperature shall be +10°C to +40°C.		

25. Professional Grade Digital Desktop Unit				
Sr.No.	**Parameter**	**Technical Specifications**	**Compliance (Yes/No)**	**Deviations**
I	Desktop Unit	Digital desktop discussion unit is required for use as a delegate version for use with a central control unit. These Delegate units shall connect to the central control unit via the standard Category 5 cabling. Each unit shall include a gooseneck microphone not less than 14" with a super-cardioid capsule to attenuate all unwanted noise. A 3.5mm headphone output jack shall be present on the units. Twin loudspeakers shall be provided in the units in a top-mounted orientation. The audio signal path shall include a digital signal processor limiter. Operating voltage shall be 9vDC to 54vDC. Total harmonic distortion shall be a maximum of 0.03% at 50mW/16 Ohms. Operating temperature shall be +10°C to +40°C.		

26. Connecting Cable.				
Sr.No.	**Parameter**	**Technical Specifications**	**Compliance (Yes/No)**	**Deviations**
I	Cable	Connecting Cables of 10 meter length for integrating the system. It shall be from the same OEM as that of Wireless Discussion System.		

Technical Specification of Civil Work required for Furnishing, supply, installation, testing, commissioning of Audio Visual system at B.Hill hall at Teaching Block of Institute

Sr.No.	Item Description	Compliance (Yes/No)	Deviations
27	False ceiling: 12mm Thick Gypsum Board will be hang on GI Channel Gap will be filled with fiber tape and final finished with Compound. With Pilling		
28	Wooden Tiles Fixing Wooden Flooring- 4'*6" wooden plank (premium quality) with thickness 8mm with skirting		
29	Window Curtain blinds 6 pcs. (1 pcs = 27 Sq ft X 6= 162 Sq.ft. Approx)		
30	Door- 32 mm thick flush door, with 1mm thick laminate, 18" handle of both sides. (Size-7.8*4 = 31.20 Aprox)		
31	Door Pilling: (Size: 20 RftApprox)		
32	Table will be made of 19 mm & 12 mm thick pine wood ply with gurjan core finish, there will be two drawers in both end of the table, inside of the table will be finished with Liner laminate & upper side of table finished with Glass Top. There will be an electrical switch inside the table for power output for multi uses and LAN Connectivity		
33	Executive Chair with full length back support, adjustable lumbar support and instant seat height adjustment		
34	Wall Paper on one wall and Texture on rest 3 remaining Wall		
35	wooden cupboard (Design: Customized)		

36	12Watt LED Bulb		
37	24 Watt LED Bulb		
38	Celling Mounted Fan (Specs:-Metallic paint finish, Decorative trims on motor cover, canopy and blades, Optimum performance even at low voltage, Double ball bearings, Speed: 300 rpm, Air delivery: 280 cmm, Power: 75 watts)		

Special Requirements.

1. Only vendor who is able to quote their rates for and delivery of all equipment/machines including civil work will be considered.
2. The system delivery should include installation on turnkey basis with dedicated onsite training to end users.
3. Warranty for machines/equipment must be at least 5 years.
4. Should also quote rates for CMC/AMC for the next five year after expiry of warranty period for all hardware items. A firm assurance of manufacturer to be given regarding the supply of spares/ accessories for 5 years after the warranty period.