

**Before Notifying/ publishing the final Technical Specification, DoIT&C uploading the draft technical specification (Annexure- A) of following IT equipment categorized as mentioned below for views/ suggestion/ recommendations of suppliers/ OEMs as per format (Annexure- B), with-in 7 days (latest by 03-04-2024) so that effective specifications may be prepared with opportunity to all prospective OEMs.**

**Following format with one example has been finalized to get the suggestions from the suppliers/ OEMs-**

**Annexure- B**

<b>S. No.</b>	<b>Category - Name</b>	<b>Level</b>	<b>Item</b>	<b>Parameter</b>	<b>Initial Specification</b>	<b>Proposed suggestion</b>	<b>Supplier/ OEM name</b>
1.	Category -6 Printer	I-Entry Level Configuration	Laser – 18 PPM	Print Resolution	600 x 600 dpi or higher	1200x1200	ABC

**Suggestions may be sent to “[semt.doitc@rajasthan.gov.in](mailto:semt.doitc@rajasthan.gov.in)” in soft copy (Excel) latest by 03-04-2024. After this date no suggestions would be considered.**

**Annexure-"A"**

**The Technical Specification of IT equipment categorized as mentioned below:**

**Catogory 14. Digital Podium: (estimated cost of Rs. 2,50,000 considering highest configuration)**

<b>Parameter</b>	<b>Minimum Technical Specification</b>
Display	24: Interactive Panel (23.8" active diagonal size)/ 21"/ 19" (As per requirement), Resolution 1920 X 1080, 10 Points Multi-touches Free stylus with eraser switch, Video I/O port, four shortcut keys, 11 - 73-degree adjustable tilt stand, Encryption AES256 / RSA2048 with Accessories (supplied with Windscreen and Anti-Shock Mount)
Integrated Controller	Touch panel control <ul style="list-style-type: none"> <li>• Min 1 VGA Input, Min 1 VGA Output</li> <li>• Min 2 Screen Control Port</li> <li>• Min 2 RS 232 Port</li> </ul> IR receiver for IR Control Squelch Control and frequency from 100 Hz to 15000 Hz (impedance less than 280 ohms)
Mobility	4 Wheels or more as required
Rack Storage	19U or more (to keep tablet/writing panel, CPU, video mixer, DSP, Amplifier, switch & WiFi modem)
Extra Ports on the podium	Power outlet, USB, LAN, Audio In, HDMI
Security	Locking front and sliding cover doors
Keyboard	Pull out the shelf for the keyboard
Controller	<ul style="list-style-type: none"> <li>• Movement of Screens, Projector, LCD Display, and Volume adjustment shall be controlled through the controller</li> <li>• Video Output can be switched from Podium Desktop and Writing panel through controller</li> <li>• Video Output can be switched from current location to remote location from the desktop/ laptop/ controller</li> <li>• Video Output of tablet/ camera of the class can be viewed at the remote site</li> <li>• Synchronization of student interaction mic with mixers/ DSP for every participating class</li> <li>• Synchronization of different speakers / mic, video equipment and amplifiers in all the classes</li> <li>• Fixed inside the podium/dias resolution : 800X480</li> </ul>

**Catogory 15. Camera**

**1) PTZ Camera 18X: (estimated cost of Rs. 1,25,000)**

<b>Parameter</b>	<b>Minimum Technical Specification</b>
Standard	OVNIF Profile S Compliant
White Balance	The camera should have an Option of Auto or Manual White Balance.
Gain Control	The camera should have an auto Gain Control
Picture controls	The camera should have picture control for brightness, color, saturation, contrast, sharpness, and gamma
S/N ratio	The camera should have a S/N Ratio of >50db.
Focus	The camera Lens should have an Auto Focus.
Sensor	The camera should have 1/2.8" HD CMOS
Optical Zoom	The camera should have a 18 X or more Optical Zoom.

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Video Output	The camera should have a standard video output though HDMI/ USB/ IP (as per requirement)
Signal Support	The camera should support signals: 1080P@30, 1080P@25, 1080i@60, 1080i@50, 720P@60, 720P@50, 720P@30, 720P@25
Pre-sets	The camera should have Up to 16 Position Pre-sets and Min. 10 accessible from IR remote.
Viewing Angle	The camera should have 6° (telephoto), 60° (wide-angle) or better
Pan Range	The camera should have Pan movement range of - 170 degrees to + 170 degrees or better
Tilt Range	The camera should have Tilt movement range of - 30 degrees to + 90 degrees or better
Remote Control	The camera should be supplied with IR remote control as an included accessory, Min. 10 pre-set should be available & should support VISCA, Pelco-D, and Pelco-P camera control protocols
Accessories	All required accessories for installation of camera to be provided like camera bracket, connector kit screws etc.
Certification	BIS
Compliance	ROHS

**2) PTZ Camera 10X: (estimated cost of Rs. 1,00,000)**

Parameter	Minimum Technical Specification
Sensor	1/2.8" 2MP
White Balance	Auto or Manual White Balance.
Gain Control	auto Gain Control
Back Light	selectable Back-light compensation
S/N ratio	S/N Ratio of >50db.
Focus	Auto Focus.
Iris	Auto/Manual Iris
Optical Zoom	10X or Higher
Digital Zoom	8X or Higher
Signal Support	The camera should support signals: 1080P@30, 1080P@25, 1080i@60, 1080i@50, 720P@60, 720P@50, 720P@30, 720P@25, PAL, NTSC
Video Output	HDMI/ USB/ IP (as per requirement)
Pre-sets	At least 128 Position Pre-sets
OSD Menu	OSD Menu for checking the status
Image Flip	Vertical and Horizontal Image Auto Flip
Pan Range	The pan movement range of - 100 degrees to + 100 degrees or better
Tilt Range	The tilt movement range of -30 Degrees to + 30 degrees or better
Communication	RS232/ IP
Remote Control	Camera ID base tracking
Accessories	The camera should be supplied with a ceiling mounting structure for proper installation
Certification	BIS
Compliance	ROHS

**3) PTZ Camera 20X: (estimated cost of Rs. 2,00,000)**

Parameter	Minimum Technical Specification
Sensor	1/2.8" 2.3MP
White Balance	Auto or Manual White Balance.
Gain Control	auto Gain Control
Back Light	selectable Back-light compensation
S/N ratio	S/N Ratio of >50db.

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Focus	Auto Focus.
Iris	Auto/Manual Iris
Video Output	HDMI/ USB/ IP (as per requirement)
Optical Zoom	20X or Higher
Digital Zoom	12X or higher
Signal Support	1080P@30,1080P@25, 1080i@60,1080i@50, 720P@60,720P@50, 720P@30, 720P@25 ,PAL ,NTSC
Pre-sets	At least 128 Position Pre-sets
OSD Menu	OSD Menu for checking the status
Image Flip	Vertical and Horizontal Image Auto Flip
Pan Range	Pan movement range of - 170 degrees to + 170 degrees or better
Tilt Range	Tilt movement range of -30 Degrees to + 90 degrees or better
Accessories	The camera should be supplied with a ceiling mounting structure for proper installation
Certification	BIS
Compliance	ROHS

**4) PTZ Camera Auto tracking 12X: (estimated cost of Rs. 3,50,000)**

Parameter	Minimum Technical Specification
Sensor	1 / 2.8" 8.6M
Video Format	2160p: 59.94 / 50 / 29.97 / 25 1080p: 59.94 / 50 / 29.97 / 25 1080i: 59.94 / 50 720p: 59.94 / 50
Video Output Interface	USB 3.0/ HDMI/ IP (as per requirement)
Genlock	Yes
Optical Zoom	12X or Higher
Digital Zoom	8X or Higher
Horizontal Viewing Angle / Vertical Viewing Angle / Diagonal Viewing Angle	81° / 50° / 90°
Shutter Speed	1/25 ~ 1/10,000 sec
Video S/N Ratio	>50dB
Minimum Illumination	0.05 lux (F1.6, 50IRE, 30fps)
Focus System/ Gain Control/ White Balance	Auto / Manual
WDR / Image Flip / 3D NR	Yes
Panning Angle	+170° ~ -170°
Tilting Angle	+90° ~ -30°
Preset Positions	128
HDMI / 12G-SDI	1080p60 or Higher
IP Protocol	HTTP/ RTSP / RTMP / RTMPS / SRT
Output	Ethernet -3G-SDI & HDMI 2.0
Certification	BIS
Compliance	ROHS

**Category 16. Video Mixer:**

**a) 4x4 Matrix Switcher with audio de-embedding: (estimated cost of Rs. 50,000)**

Parameter	Minimum Technical Specification
Output	Min. 4 HDMI/ USB matrix output (as per requirement)
Input	Min. 4 HDMI/USB Input (as per requirement)
Compliant	HDCP, EDID Compliant
Support	4K/UHD capability @60Hz
CEC	CEC display control
Audio De-embedding	Built-in HDMI audio de-embedding

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Color Depth	8bit, 10bit
Bit Rate	upto 24-bit
Audio	Multi-channel audio compliant
Control	TCP/IP, RS232 & IR Control
Certification	BIS
Compliance	ROHS

**b) Video Mixer: (estimated cost of Rs. 2,00,000)**

Parameter	Minimum Technical Specification
Video In	HDMI type-A/ USB × 4 (as per requirement)
Video Out	HDMI type-A PGM/ USB ×1, HDMI type-A Multiview/ USB ×1 USB 3.0 type C ×1 (Streaming on PC) Assignable HDMI 1~4/ USB, PGM, Clean PGM, PVW, Color bar, Multiview
PC Control Port	LAN×1
Media Library	USB type-A ×1(USB disk port for image import and firmware upgrade)
Transitions	T-Bar/AUTO/ CUT
Effects	Wipe (9×2 patterns)/ Mix/ DIP/ Pattern/ Still(freeze)/ MUTE/ FTB
Audio Mixer	USB/ HDMI ×4 and MIC/ Line level ×2; Audio delay: 0-500ms
Generators	Pattern generator ×1 Colour generators ×2
Accessories	Power supply (12V2A) ×1; USB cable (type A-C) ×1; Tally connector (DB-15) ×1
Certification	BIS
Compliance	ROHS

**Catogory 17. Video Graphic Processor**

**1) Video Graphic Processor: (estimated cost of Rs. 2,00,000 considering higher configuration)**

Parameter	Minimum Technical Specification
Compatibility	Windows 11 / 10/ 8
Form Factor	Desktop external GPU system
Base and Boost Clock:	2.21 and 2.51 (GHz)/ 1.4 and 1.7 (GHz) or higher
Memory Interface Width:	256-bit/ 384-bit
Display Resolution:	7680x4320
Connectors:	3xPCIe 8-pin cables (adapter in box) OR 450 W or greater PCIe Gen 5 cable
Standard Mount Interface:	24 GB GDDR6X/ 16 GB GDDR6X or higher
Resolution	4CIF/DCIF/2CIF/CIF/QCIF/Real-time
Sync	Video and Audio Synchronization
Expansion Slots:	3-Slot (61mm)
Certification	BIS
Compliance	ROHS

**Catogory 18. Wall / Ceiling Speakers**

**1) Wall / Ceiling Speakers (15W): (estimated cost of Rs. 25,000 considering higher configuration)**

Parameter	Minimum Technical Specification
Effective frequency range	65 Hz to 20 kHz
Rated noise power / voltage	15 watts / 15.5 volts (rms) or 18 watts / 15.5 volts (rms) (as per requirement)

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Broad-band sensitivity	89 dB SPL
Coverage angle (-6 dB)	110° (500 Hz to 5 kHz)
Maximum continuous SPL	104 dB
Maximum peak SPL	110 dB
Rated impedance	8 ohms
Woofer	Woofer size to be 6" or more HD Type
Frequency	The Speaker should have a frequency response of 80 Hz to 17,000 Hz
Baffle material	Painted ABS polymer
Grille material	Powder coated steel
Back can material	Galvanized steel
Certification	BIS
Compliance	ROHS

**Category 19. Power Amplifier (estimated cost of Rs. 1,00,000 considering higher configuration)**

Parameter	Minimum Technical Specification
Channels	1/ 2/ 4 (as per requirement)
Stereo Mode (all channels driven) 8 $\Omega$ 4 $\Omega$	100 W per channel
Bridged Outputs (all channels driven) 8 $\Omega$ & 4 $\Omega$ 70 V 100 V	Minimum power (in watts) per channel > (total power of amplifier)/ No. of channel(s)
Frequency response (4 $\Omega$ and 8 $\Omega$ )	20 Hz - 20 KHz +/- 0.1 dB
Signal to noise (20 Hz - 20 KHz)	85 dB or Higher
Input sensitivity	1.23 V (+4 dBu)
Output circuitry	Class D
Input impedance	>10k
Cooling	Convection
Controls	4 $\Omega$ /8 $\Omega$ /70 V Bridged High pass On/100 V Bridged High pass (per channel pair)
Dimensions	Should be well adjustable in Podium
Certification	BIS
Compliance	ROHS

**Category 20. DSP with Audio Mixer (estimated cost of Rs. 2,00,000)**

Parameter	Minimum Technical Specification
Audio Ports	Digital Signal Processor with at least 8 Audio Ports IN and minimum 8 Out is required including Audio Input for: <ul style="list-style-type: none"> <li>1 No Gooseneck Mic</li> <li>2 No Handheld Mic</li> <li>1 No Lapel Mic</li> <li>1 inbuilt or external USB Audio Port to allow digital connection between DSP and the PC</li> <li>01 Laptop in (Preferably USB)</li> </ul>
Echo Cancellation	Digital Signal Processor with an Acoustic Echo Cancellation of up to 60 dB would be required or better
Noise Cancellation	The Digital Signal Processor should perform Noise Cancellation of up to 20 dB for the podium microphone, Wireless Lapel Microphone and Handheld Microphone
Environment Noise	The Digital Signal Processor should suppress residual Echo to the Environment Noise Level to prevent Artificial ducking of signal
Equalization	The Digital Signal Processor should have Power Level Equalization

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Convergence	Convergence during full duplex
Control	Should have RS232/ Ethernet for control through third party Control system.
Frequency Response	20 Hz to 20 KHz
Dynamic Range	100 dB or better.
Certification	BIS
Compliance	ROHS

**Category 21. Mic**

**1) Handheld Mic: (estimated cost of Rs. 50,000)**

Parameter	Minimum Technical Specification
Type	Wireless Handheld Microphone
Switching Bandwidth	Up to 24 MHz
Signal to noise ratio	>102dBA or better
Total Harmonic Distortion	<0.9%
Transmitter sync	2.4GHz
Frequency Response	80Hz to 14KHz or better
Sensitivity	< 3 $\mu$ V at 52 dB(A)
Functionality	Mute/unmute button
Operating time	10 hours or better

**2) Lavalier Microphone: (estimated cost of Rs. 50,000)**

Parameter	Min. Specifications
Type	Wireless Lapel Microphone
switching Bandwidth	Up to 24 MHz
Signal-to-noise ratio	>102dBA or better
Total Harmonic Distortion	<0.9%
Transmitter sync	2.4GHz
Frequency Response	50 Hz to 16KHz or better
Sensitivity	< 3 $\mu$ V at 52 dB(A)
Pre-polarized Polar Pattern	Omni-directional or better
Operating time	10 hours or better

**Category 22. Switcher (estimated cost of Rs. 1,50,000)**

Parameter	Minimum Technical Specification
Audio Output	4KUHD+ 4x2 HDMI Matrix
Connection	Four sources of (4KUHD+ HDMI)
Support signal	4K@60Hz (4:4:4, 8- bit) & 16 bit deep color HDR (High Dynamic Range), 3D content, HD audio and other features defined by the HDMI 2.0
input	independently set to use either an internal (1080p@60Hz) or external (sink-copied) EDID
per-output auto	source switching & connected display power control using CEC or RS-232
Switching Response	freely switch between input source

**Category 23. Projector (estimated cost of Rs. 40,000 considering higher configuration)**

Parameter	Minimum Technical Specification
Technology	3 LCD
Projection Method	Front & Rear Both
Minimum Resolution	XGA (1024 x 268)/ WXGA (1366 x 768) (as per required)
Brightness	Minimum 3300 ANSI Lumens for Color Light & White Light Output Both
Contrast Ratio	15000:1



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Aspect Ratio	Minimum 4:3
Throw Ratio	1.44 – 1.95:1
Lamp Type	UHE
Lamp Life	Minimum 6000 Hrs. Normal Mode & 12000 Hrs. in Eco Mode
I/O Connection	VGA, HDMI
Warranty	3 Years comprehensive on site OEM warranty

**Category 24. UPS**

**a) 2 KVA (estimated cost of Rs. 10,000)**

Parameter	Minimum Technical Specifications
UPS Capacity	2 KVA
Mode	Line interactive
Protection	Full Protection
voltage	230V +-10%
Range	160V - 280V
Power factor	0.7 or higher
Back up time	168 VAH for 30 Minutes backup on 1 PC (Inbuilt Batteries)
Indicator	Mains On/ On Battery/ Low Battery/ Fault/ Overload
Plug and cable	Input cable with 3 pin Indian plug and output have 4 nos. of 5 pin Indian socket
Battery Type	Sealed Lead Acid Valve Regulated
Alarm	ON Battery/ Fault Over Load, Low Battery
Certifications	BIS
Compliance	ROHS
Test report	OEM should submit test report for the quoted model issued by State/ Central laboratory/ NABL accredited labs (not old from last 5 Years)
Warranty	3 Years comprehensive on site OEM warranty

**Category 25. LCD Writing Panel**

**a) Interactive White Board 21": (estimated cost of Rs. 20,000)**

Parameter	Minimum Technical Specification
Size	Size should be 21 inch or higher
LED	The monitor should be LED backlit.
Resolution	The monitor should have a native resolution of 1920x1080 or better
Port	Should come with a USB port for control signals.
Luminosity	The monitor should have a Luminosity of 210 cd/m <sup>2</sup> or more.
Connectivity	Should have a 15 Pin HD Input ports or DVI port.
OS Support	Should support Win 7 or higher.
Sensor	Should have an Electromagnetic Sensor Method.
Certification	BIS
Compliance	ROHS

**#### End of Document ####**