

ANNEXURE 2

**Facilities (Indicative)
to be provided &
General
Specifications**

Facilities (Indicative) to be provided

Total Number of Digital Classrooms to setup – 4 No.s (2 Class Rooms per School)

S. No.	Items	Quantity
1	Laptop	4
2	IR Camera	4
3	Projector	4
4	Ceiling Mount Kit	4
5	UPS	4
6	Speaker	4
7	Green Board	4
8	Learning Management System	4
9	Mobile Device Management or equivalent software	4
10	Manpower for Operation & Management	1 Year
11	Capacity Building of teacher	3 Days Introductory and 2 day Refresher after 1 month, and 1 day refresher after 3 months

The Bidder should provide authorization from OEM or Authorized Distributor/Reseller of the OEM."Certification: UL, Bidder to enclose the UL certification"

HADRWARE & SOFTWARE SPECIFICATIONS

Hardware Specifications

The package of robust infrastructure is defined by considering schools local conditions and usage level and operational context. Under this model, Digital Classroom would have the facilities as under:

- Projector
- Ceiling Mount Kit
- IR Camera
- Laptop
- UPS
- Speaker
- Green Board

Details of hardware specifications, along with the technical specifications are mentioned below.

IR Camera Detailed Specification

Tender Specifications	
Particulars	Specifications
Simultaneous Touch points	Up to 255 touch Points
Connectivity Interface	USB
Interactive response	Real time interaction and writing speed without any time lag . Tracking speed: Upto 195 Mn dots / sec or better
Features	
Interactive Area	Tracking Active Area/active screen area must be Minimum 80 inches diagonal or higher with Interactive size of minimum 90 inches or more. The distance between the IR camera device and white board shouldn't be more than 25 CM.
Calibration	Should be enabled with functional, robust & Precise auto-calibration as well as manual calibration features.
External light Source disturbance	Should be able to cut-off any stray light disturbance on the interactivity with Dual Band Pass filter: 830nm +/- 20
Aspect-Ratio Independent	Can be used with 4:3 or 16:9 Aspect ratio
Pen/Stylus	Super capacitive Stylus, No consumable. Minimum 3 hrs continuously work after 3 to 4 minutes of charging & with a life of more than 1 million charge cycles
Writing	Smooth and rounded writing experience

performance
Interactive Software
<ul style="list-style-type: none"> • Should Support multi touch & multi writing • Should support Gesture Recognition like zoom, pan, tilt, flicks etc. • Native handwriting recognition of English, Telugu, (on Windows OS platform) • Should have the following interactive tools/features including but not limited to like Pen, Eraser, spot light, curtain, shape recognition, shape editing, auto grouping, infinite colour options for annotation, colour bucket, back ground pattern, lines & arrows, screen capture tools (freehand capture is must), import / export files, recycle bin, unlimited pages, Cut & Paste, page navigation, save page(s), Undo/Redo, Geometric
Tools like protractor, compass, ruler etc.
<ul style="list-style-type: none"> • Shape-recognition up to six-sided figures • Should capable to annotate on any 3rd party applications • Should Super compressed screen recording feature. (1 min of recording should take 1.8MB to 4MB space) without compromising on quality. • Extensive Resource Library with relevant Educational content • Capability of taking Snapshot from running video • “Cloud Access” in Interactive Whiteboard Application to access free educational content on any topic in the world, the content should be curated and filtered to suite education needs only.
General
ISO certified for Quality

Laptop Detailed Specification

ITEM		DESCRIPTION
Processor	Make	Intel Core i3 :6006u (2.0 GHz, 3MB Cache) or / AMD FX / AMD A10 Processor or higher configuration
	Technology	14 nm or lower
	Wattage	15 W or lower
	Cache	3 MB or higher
Memory	Capacity	4GB DDR4 2133 Mhz or higher expandable to 16 GB. 2 DIMM Slots
	Technology	DDR4
Hard Drive	Capacity	500 GB or higher
	Interface	SATA
	Speed	7200 RPM or higher
Display	Size	14” Non Glare LED backlit with brightness (200 nits) or higher
	Resolution	1366 x 768 or higher
	Port	VGA, HDMI

	Technology	HD, WLED
Chipset	Make & Model	System on Chip
	Graphics	Integrated graphics
Wireless Network Card	Technology	Intel dual band wifi card (802.11 ac =BT4.0)
Network Card	Technology	10/100/1000 – Gigabit LAN
	Speed	10/100 /1000
Battery Power	Backup	4 - cell battery or battery giving 5 hours or higher
Security		TPM 2.0
Miscellaneous	USB	4 USB of which minimum 3 should be USB 3.0 ports
	Microphone	Built-in
	Webcam	HD 720P Webcam or Higher
	Keyboard	Standard keyboard
	Touchpad	Multi Gesture Touch Pad
	Bluetooth	Built in
	Audio	Built-in dual speakers.
	Carry Bag	Student Backpack
	Card Reader	Supporting SD, SDHC and SDXC
Warranty		3 years comprehensive including battery
Software Compatibility		Windows 10/ DOS
Certification		EPEAT SILVER or higher

Short Throw Projector Specs

- Brightness - 3000 Lumens
- Native Resolution-XGA(1024X768)
- 13000:1 Contrast Ratio
- Throw Ratio 0-0.61
- Lamp Type-190W
- Aspect Ratio -Native 4:3
- Projector Accessories - Accessories for Short throw Cable are Wall Mount Kit (Size 1500MM)/10 M VGA Cable/10M Power Cable

Speaker

- 2.1

UPS with Cabinet with cabinet

- 1 KVA/700Watts Online (Single Phase Input – Single Phase, Output) UPS system with sealed maintenance free battery for 180 minutes, backup time.

Green Board with Simple Frame

- 3x4 feet

Software Specifications

Learning Management System Features

- **Mobile Learning Environment** - Deliver multi publisher, multi format content in a seamless manner Incorporate adaptive learning, social and collaborative learning
- **Course Delivery Engine** - Cloud based LMS that teachers can use to deliver course-ware, assessments etc. Aggregate the largest basket of qualified learning content. Dynamically add/update existing courseware with new content
- **Content Security** - Scalable & secure solution for offline distribution & access of content
- **Active Analytics** - Real time Dashboard for the Management on the Teacher Engagements. Usage Trends. Course Wise Learning Dashboard – Time Spent on each Lesson.

Mobile Device Management

- **One solution, all devices** – System should be capable to Manage computing devices: notebooks, smartphones or tablets – Windows, Android, or Apple
- **Cloud-based and intuitive** - “Anywhere” access to your management tools, quick to deploy and easy-to-use

General Specifications for Various Works to be followed in the project duration including O&M period, by the Selected Bidder

1. QUALITY STANDARDS AND CONTROL

1.1. PRODUCTS AND EXECUTION

1.1.1. INCOMPLETE DOCUMENTATION

- Where and to an extent that products are not fully documented they should be:
 - of standard appropriate to the nature and character of that part of works where they will be used;
 - suitable for the purpose stated or reasonably to be inferred from the project documents;
- Omissions or errors in description or quantity shall not vitiate the Contract nor release the Bidder from any obligations or liabilities.

1.1.2. INSTALLER QUALIFICATIONS & SKILLS

- Operatives should be appropriately skilled and experienced for the type and quality of work.
- Operatives should be able to produce evidence of their qualifications when requested.

1.1.3. PRODUCTS

- Products should be new and unused, properly wrapped, boxed and shipped to site (and approved by the Client/Client's representative);
- Supply of the product should be from the same source or manufacturer;
- Whole quantity of the product should be of consistent kind, size, quality and overall appearance;
- Where critical, measure a sufficient quantity to determine compliance;
- Deterioration should be prevented during the lifecycle of the project, products should be ordered in suitable quantities to a programme and used in appropriate sequence.

1.1.4. EXECUTION

- Generally fix, lay, apply, install products securely, accurately, plumb, neatly and in specified alignment;
- Do not use different colour batches where they can be seen together;
- Check on-site dimensions;
- Finished work should be free of defects, not damaged, disfigured, dirty, and faulty or out of tolerance;
- Adjust joints open to views so they are even and regular.

1.1.5. PROTECTION

- The Bidder shall exercise extreme care in the execution of his work, will provide all necessary safeguards and exercise caution against injury or defacement of existing site. He will ensure that his works in no way shall adversely affect the work of others or adjoining properties;
- The Bidder
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1.1.6. COMPLIANCE

- Proprietary specifications should be followed;
- Evidence that the proprietary product specified has been supplied and used on site should be retained by Bidder;
- Should specified product being not available, notify the Client's Representative with both available substitution and reasonable explanation for approval of Client's Representative.

1.1.7. INSPECTIONS

- Notify Client's Representative in writing 2 days in advance when reasonable sections of the following stages are ready for inspection on the works quality. Obtain confirmation from Client's Representative before proceeding to next stage. Inspections should be done at the following stages:
 - Delivery of each shipment of materials to site,
 - At ready for Substantial Completion inspection,
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 - As desired by client
- Inspection or any other action must not be taken as approval unless confirmed in writing. Written statement should include:
 - Date of the inspection,
 - Part of the work inspected,
 - Characteristics which are approved,
 - Extent and purpose of the approval,
 - Any associated conditions.

1.1.8. RELATED OR NEW WORK

- Provide all traders with necessary details of related types of work;
- Before commencing new type/section of work ensure previous work is:
 - Appropriately complete,
 - In accordance with project documents,
 - To suitable standard,
 - In suitable condition to receive new work,
- Ensure all necessary preparatory work has been carried out.

1.1.9. MANUFACTURERS RECOMMENDATIONS/INSTRUCTIONS

- Always comply with manufacturers printed recommendations and instructions current on the date of the invitation to tender;
- If there are any changes to recommendations or instructions – submit details to Clients Representative prior to ordering for approval.

1.2. SAMPLES AND APPROVALS

1.2.1. GENERAL

- Products or installations should comply with all specification requirements and in respect of the stated or implied characteristics to match a sample expressly approved as a standard for the purpose.

1.2.2. APPROVAL OF PRODUCTS

- Submissions, samples, inspections and tests should be undertaken and arranged to suit the Works programme;
- Do not confirm orders or use the product until approval of the sample has been obtained;
- Approved sample should be retained in good, clean condition on site. Remove when no longer required.

1.2.3. APPROVAL OF EXECUTION

- Submissions, samples, inspections and tests should be undertaken and arranged to suit the Works programme;
- Do not conceal, or proceed with affected work until compliance with requirements is confirmed.

1.2.4. SETTING OUT/ACCURACY

- If tolerances and dimensions likely to be critical to execution or difficult to achieve proposal or site inspection of the appearance should be arranged for as early as possible;
- General tolerances (maximum) should comply with approved local standards.

1.3. WORK RELATED TO OR AROUND SERVICES

1.3.1. COMPLIANCE WITH REGULATIONS

- Work related to or around any existing or new services should comply with the Bylaws and Regulations of the relevant statutory authority;
- Any relevant documentation required to start the work or at the completion to be submitted to relevant statutory authorities. This should be included in Detailed Programme of Work;
- Site organisation staff must include one or more persons with appropriate knowledge and experience of IT, mechanical and electrical engineering services to ensure compatibility between engineering and the Works generally;
- Submit when requested CVs or other documentary evidence relating to the staff concerned;

1.4. SUPERVISION/INSPECTION/DEFECTIVE WORK

1.4.1. KICK-OFF MEETING

- Prior to commencing work, the Bidder will meet the PMC and all other concerned parties on the site to review the work under this section. The Bidder will request this meeting in writing prior to the desired meeting Schedule;

- The meeting will define the scope of work of the Bidder, and also identify all key stakeholders involved in the overall site works;
- The sequence and schedule for Works, key contacts and communication protocol shall be discussed;
- Bidder to highlight if any additional information is required by him prior to commencement of works.

1.4.2. SUPERVISION

- In addition to the constant management and supervision of the Works provided by the Bidder's person in charge, all significant types of work must be under the close control of competent supervisors to ensure maintenance of satisfactory quality and progress.

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1.4.3. DEFECTS IN EXISTING WORK

- When defects discovered, immediately give notice. Do not proceed with affected related work until response from the Clients Representative has been received;
- Documented remedial work. Do not execute work which may
 - hinder access to defective products or work;
 - be rendered abortive by remedial work.

1.4.4. ACCESS FOR INSPECTION

- Before removing other facilities for access, give notice of not less than 48 hours.

1.4.5. TESTS AND INSPECTIONS

- Agree and record dates and times of tests and inspections to enable all affected parties to be represented;
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- Always submit a copy of test certificates to Clients Representative upon receipt and retain copies.

1.4.6. RECTIFICATION OF DEFECTIVE PRODUCTS/ EXECUTIONS

- Immediately after any execution or product is known, or appears, to be not in accordance with the Contract, submit proposals for opening up, inspection, testing, making good, adjustment of the Contract Sum, or removal and re-execution of works;
- Such proposals may be unacceptable and contrary instructions may be issued.

1.4.7. MEASURES TO ESTABLISH ACCEPTABILITY

- Wherever inspection or testing shows that the work, materials or goods are not in accordance with the contract and measures (e.g. testing, opening up,) are taken to help in establishing whether or not the work is acceptable, such measures:
 - **Will** be at the expense of the Bidder;
 - **Will not** be considered as grounds for extension of time.

1.4.8. QUALITY CONTROL

- Establish and maintain procedures to ensure that the Works, including the work of subJV/Consortium, comply with specified requirements;
- Maintain full records, keep copies
- on site for inspection, and submit copies on request;

- Records should include:
 - Identification of the element, item, batch or lot including location in the Project Works,
 - Nature and dates of inspections, tests and approvals,
 - Nature and extent of non-conforming work found,
 - Details of corrective action.

1.5. WORK AT OR AFTER COMPLETION

1.5.1. WORK BEFORE COMPLETION

- Make good (correct/repair) all damage consequent upon the Works;
- Remove all temporary markings, coverings and protective wrappings unless otherwise instructed,
- Clean work site, thoroughly inside and out, including all accessible ducts and voids. Remove all splashes deposits, efflorescence, rubbish and surplus materials,
- Cleaning materials and methods for proprietary products should follow recommendations by manufacturers of products being cleaned, and must not damage or disfigure other materials or construction,
- Substances hazardous to health information sheets to be obtain for all materials used for cleaning and ensure they are used only as recommended by their manufacturers,
- For minor faults - touch up in newly painted work, carefully matching colour and brushing out edges. Repaint badly marked areas back to suitable breaks or junctions,
- Any moving parts of new work should be adjusted, eased and lubricated as necessary to ensure easy and efficient operation.

1.5.2. SECURITY AT COMPLETION

- Leave the Works and storage areas secure with, where appropriate, all accesses closed and locked. Account for and adequately label all keys and hand over to Client.

2. HEALTH AND SAFETY

The safe completion of the works is a primary aim of the contract. All works should be executed in compliance with all applicable statutory requirements. Below listed are general requirements and items, Bidder should take care of and provide in respect to Health and Safety.

2.1.1. STORAGE FOR MATERIALS/EQUIPMENT ON SITE

- The Bidder should allow for a storage area for materials and equipment used on site.
- The Bidder shall ensure that no material is delivered, dumped or off loaded on the site unless the Client's Representative has approved the area for it.
- Storage area should follow Health and Safety requirements.

2.1.2. EXISTING WORKS

- Special precautions shall be taken by the Bidder to avoid damage to existing buildings, structures, sewerage pipes, storm water drains, and pipes, storm water grids, and inlets, manholes, valve casings, water pipes and taps, fire hydrants, irrigation pipes and equipment, cables, completed landscaping works, telephone and light poles, vegetation and other services.
- Bidder to follow Health and Safety requirements as per international standards

2.1.3. PROTECTION OF PROPERTY

- The Bidder shall take all necessary precautions against damage that might occur to any person, animal, building, structure, services, vegetation, vehicles etc

2.1.4. CLEARING UP

- Upon completion of the work, the Bidder shall remove all waste materials or rubbish from and around the work areas, together with all tools, equipment and materials, and shall leave said areas in a condition satisfactory to Client's Representative. Carefully remove items indicated to be salvaged and stored the site where indicated.