Annex1: Requirement and specifications
Requirement:

Item no	Requirement	Quantity
1.	Handheld pulse oximeter	2
2.	Syringe pump	23
3.	RF cautery machine	1
4.	Infusion pump	23
5.	Electrical OT table	1
6.	Defibrillator with AED	3
7.	Suction apparatus	2
8.	Cardiac monitor with capnography (wall mounted)	12
9.	Cautery machine	2
10.	Anesthesia workstation	1
11.	CPR bed	1
12.	Portable ventilator	2
13.	CPR machine	1
14.	Electrical examination table	3
15.	Video laryngoscope	2
16.	Aneroid BP apparatus	9
17.	Macintosh laryngoscope full set	3
18.	McCoy laryngoscope full set	3
19.	Cardiac monitor with rolling stand	3
20.	Stethoscope: pediatric (Littman)	9
21.	Stethoscope: pediatric cardio 3 (Littman)	9
22.	Stethoscope: adult (Littman)	9
23.	Stethoscope: adult cardio 3 (Littman)	9
24.	Fingertip pulse oximeter - pediatric	9
25.	Fingertip pulse oximeter - adult	9
26.	Forehead IR thermometer	6
27.	Nebulizer (Heavy duty)	4
28.	Digital Thermometer	8
29.	Patient warmer	5
30.	BiPAP machine	3
31.	Cast cutter with suction	1
32.	Examination light with rolling stand	3

33.	Vital sign monitor with rolling stand	3
34.	ECG machine with trolley	2
35.	otoscope	3
36.	ophthalmoscope	3
37.	Weighing scale	5
38.	Wall mount diagnostic set	3

Specifications

Note: Shown pictures are only for equipment identification

Item 1: Handheld pulse oximeter: Used to measure the oxygen saturation of blood and pulse rate

- Continuous measurement
- Measuring range: 50 – 100%
- SpO2 accuracy: +/-2 % (80 – 100 % saturation) , +/-3 % (70 – 79 % saturation)
- PR measuring range: 30 – 250 bpm.
- PR accuracy: +/- 2 bpm
- Should have audible and visual alarm
- Should be working with rechargeable battery and charger should be supplied with the machine
- Standards, Safely, Training and warranty
  1. Should be a CE / FDA Approved product and should comply with ISO standards
  2. 12 months warranty from the date of handing over or installation and commissioning

Item 2: Syringe pump: helps deliver an accurate number of fluids, whether nutrients or medications, into the patient's body in a controlled manner

1. Microprocessor controlled with digital LCD alphanumeric display of parameters and Alarms
2. Variable rate ranging from 0.1 to 500 mL/hr. or better, with 0.1 mL/hr. increments
3. 3 % accuracy or better
4. Variable volume-to-be-infused from 1 to 1,000 mL or similar
5. Digitally displayed parameters to include:
    5.1. Infusion rate
    5.2. Battery / AC operation
    5.3. Running indicator
    5.4. Alarming condition when active, with indication of alarm type or code
    5.5. Back pressure monitor / indicator
6. Capability to accept different syringe types and sizes with automatic syringe detection and identification
7. Syringe compatibility and auto detection shall include but not be limited to all sizes of the following (1 to 60 mL):
    7.1. BD
    7.2. Terumo
    7.3. Monojet
    7.4. Braun
    7.5. Fresenius
8. Variable bolus rate
    8.1. Specify maximum flow rate
    8.2. Bolus infused volume indicator during bolus activation
    8.3. Protected access
9. Audiovisual alarms shall include but not be limited to the following:
    9.1. Syringe installation and integrity (detection)
    9.2. Line disconnection (sudden drop in back pressure)
    1.3. Occlusion pressure pre-alarm
    9.4. Occlusion pressure
    9.5. Near end of perfusion alarm
    9.6. End of perfusion
    9.7. Volume limit pre-alarm
    9.8. Volume limit
    9.9. KVO (1 ml/hr.; if other, specify)

9.10. Low battery pre-alarm

9.11. Discharged battery

9.12. Internal malfunction

10. Data log capability and data port for data transmission, display and printing.

Any required software for such function shall be included.

11. Logged data to include:

11.1. Settings

11.2. Alarms

11.3. Errors

12. Safety features shall include but not be limited to:

12.1. Self-test at start-up

12.2. Nurse call interfacing capability

12.3. Splash proof design

12.4. Auto priming

12.5. Adjustable alarm volume. No permanent silencing shall be possible.

12.6. Keypad lock

12.7. Impossibility to improperly install infusion set

12.8. Free flow prevention system

12.9. Last parameter setting retention

Environmental factors

- Shall meet IEC-60601-1-2 :2001(Or Equivalent BIS) General Requirements of Safety for Electromagnetic Compatibility. or should comply with 89/366/EEC; EMC-directive.
- The unit shall be capable of being stored continuously in ambient temperature of 0-50deg C and relative humidity of 15-90%

Power Supply

- Power input to be 220-240VAC, 50Hz fitted 13Amp plug, type G
- Battery autonomy of 3 hrs. or more when fully charged. Specify:

  Specify battery type and characteristics (voltage and current capacity)

  Autonomy at 10 mL/hr.

  Recharging time from depleted to 90%

Standards, Safety and Training

- Should be FDA approved and CE marked
- Manufacturer should have ISO certification for quality standards.
- The unit and the accessories must be supplied with one year of warranty starting from the date of installation.
- Application training must be provided to the users.

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Documentation

- User/Technical/Maintenance manuals to be supplied in English.

List of important spares, accessories with their part numbers must be provided

Item 3: RF Cautery machine: Used for cutting, coagulating and removing soft tissues. Used mainly for dermatological applications

- **Specifications:**
- Should be Micro controlled with Digital Display
  - Frequency 0.5 – 2.5 MHz or better
  - Should be Portable with weight not more than 3Kg
  - Should have Selector Switch for Coag / Cut
  - Should have fulguration as an optional feature
  - Power Output:
    - Cut: 120 Watts on 400 ohm or better
    - Coagulation: 100 watts on 400 ohm or better
    - Bipolar: 80 watts on 100 ohm or better
  - Should have foot switch and hand switch activation

  - **Accessories:**
  - Monopolar Hand piece – 2 Nos
  - Mono polar cable – 2 Nos
  - Mono polar electrodes of variable shapes – 1 Set
  - Bipolar cable – 2Nos

- Bipolar handpiece – 2 Nos
- Patient plate with cable – 2 Nos
- Hand witch – 1 Nos

Environmental factors:

- The unit shall be capable of operating continuously in ambient temperature of 10-40 deg c and relative humidity of 15-90%
- The unit shall be capable of being stored continuously in ambient temperature of 0-50 deg C and relative humidity of 15-90% .

Power supply:

- Power input to be 220-240 VAC, 50Hz fitted with 13A plug .

Standards, Safety and Training

a. Should be FDA/CE approved product
b. The unit and the accessories must be supplied with two years of warranty starting from the date of installation.
c. Application training for doctors should be given within 2 months after installation

Documentation

d. User/Technical/Maintenance manuals to be supplied in English.
e. List of important spare parts and accessories with their part number and costing.
f. Contact details of both local supplier and manufacture for service and maintenance and must be provided.

Item 4: Infusion pump: Used to deliver controlled volume of fluids to patients

Specifications

- Should have LCD/LED Display
- Clearly visible visual alarms
- Acoustic alarms should not be less than 45 Db
- Anti-bolus system should be available
- Air bubble detector with single and cumulative functions
- Line clamping device should be available
- Adjustable occlusion sensitivity
- Audible and visual alarms in following conditions
    1. Power failure
    2. Low battery
    3. Air in line
    4. Occlusion
    5. End of infusion
    6. Door opened
    7. Infusion errors or equipment malfunction
- Infusion flow rate : 0.1 to 999 ml/Hr
- Flow rate accuracy n ot higher than +/- 5%
- KVO Rate: 0.1 – 5ml/hr
- RS232/USB Interface for data transmission
- Machine should be spill proof and easy to clean

Power Supply

- Power input to be 220-240VAC, 50Hz fitted 13Amp plug.
- Should have battery backup which can run for at least 5 Hrs.
- Alarm protection in following situations
    - Power failure
    - Battery low

Standards, Safety and Training

- Should be FDA/CE approved product
- The unit and the accessories must be supplied with one year of warranty starting from the date of installation.

Documentation

- User/Technical/Maintenance manuals to be supplied in English.

- List of important spare parts and accessories with their part number and costing.

Contact details of both local supplier and manufacture for service and maintenance and must be provided.

Item 5: Electrical OT table (General surgery): Used to keep the patient in place while the surgical team operates, and may move various parts of the body using surgical table accessories for easier access to the surgical site

General Specification

- Should be made of medical grade stainless steel, easy to clean and rust proof
- Should have manual positioning setup (In case of electrical failure)
- Should have remote control as well as on table control panel

Table Dimension and movements

Table Length	81" (2057 mm)
Table Width	20" (508 mm) (28" with extenders)
Table Height Range	(450 to 1100 mm)
Table Slide Range	9" (227 mm) to head, 9" to foot (18" total)
Patient Weight Capacity	1,100 lbs. (500 kg) patient support, including raise/lower (centered on the column) 1,000 lbs. (454 kg) full table articulation (centered on the column) 600 lbs. (272 kg) full table articulation, including slide
Table Shipping Weight	560 lbs. (254 kg)
Trendelenburg / Reverse	30° / 30°
Lateral Tilt (left/right)	20° / 20°
Head Section	+90° to -90°

Back Section	+80° to -40°
Leg Section	0/-105° (removable)
Flex/Reflex	140° / 100°
Manual Override	Yes
Perneal Cut-out	Yes

Accessories:

Item	Qty
Headrest	1pc
Armrest	1 pair
Waist support holder	1 pair
Shoulder support holder	1 pair
Leg support holder	1 pair
Footrest	1 pair
Anesthesia screen frame	1 pc
Body strap	1 set
Handset controller	1 pc
Lateral controller inner constructed on side of table	1 set

Power Supply:

Line voltage 220-240AC, 50-60Hz and fitted with a 13amp plug.

Standards, Safety, Warranty and Training

1. Should be FDA/ CE marked product
2. Application training must be provided to the users.
3. Should be provided 12 Months warranty from the date of installation.
4. Manufacturer standard biomedical technical must be given to URH Biomedical Engineers within one year of installation.

Documentation

1. User/Technical/Maintenance manuals to be supplied in English.
2. List of important spare parts and accessories with their part number and costing

3. Contact details of both local supplier and manufacture for service and maintenance are must

- **Item 6: Defibrillator with AED:** Defibrillator is required for reviving the heart functions by providing selected quantum of electrical shocks with facility for monitoring vital parameters.

Operational Requirements:

- Should be compact, Lightweight, easy to use, Bi-Phasic Defibrillator with Manual and AED. (With easy 1-2-3 operation).
- Should monitor ECG and display them.
- Should be able to print the ECG on thermal papers.
- Should be capable of doing synchronized cardio version.
- Can be operated from mains as well as battery.

Technical Specifications:

- Should be a Low Energy Biphasic Defibrillator monitor with recorder, having capability to deliver shocks from 2 Joules to 200 Joules or better.
- Should monitor ECG through paddles, pads and monitoring electrodes and Defibrillate through pads and paddles.
- Should compensate for body impedance for a range of 25 to 150 ohms.
- Should have a built in 50 mm strip printer.
- Should have charging time of less than 5 seconds for maximum energy.
- Should have High resolution more than 8-inch Color display for viewing monitoring.
- Parameters like ECG and SpO2 with 3 waveform capability of 4 seconds.
- Both Adult and pediatric paddles should be available.
- Should have event summary facility for recording and printing at least 55 events.

- Should have a battery capable of usage for at least 5 hours of monitoring.
- Should be capable of printing Reports on Event summary, configuration, self-test, battery capacity etc.
- Should have facility for self-test/check before usage and set up function.

System configuration accessories, spares and consumables:

- Defibrillator with AED and External Pacemaker – 01
- Built in Adult + pediatric External Paddles - 01
- ECG Cable - 01
- Paper Rolls – 50
- Adult SpO2 reusable Sensor – 01
- AED Multifunction Pads for Adults - 5 pairs with Each unit
- AED Multifunction Pads for pediatrics- 5 pairs with Each unit
-

Power Supply:

- A 220-240AC, 50Hz mono-phase electrical source with a 13amp, plug type G.
- Should have a battery, capable of usage for at least three hours.

Standards/Cortication and Safety:

- Should be a CE / FDA Approved product and should have ISO standards.

Trainings and Warranty:

- The unit and the accessories must be supplied with two years of warranty.
- End users should be trained by the company application personnel.
- Service training must be given to Biomedical engineers of Ungoofaaru Regional Hospital.

Item 7: Suction apparatus:

It shall be used to remove/evacuate soft tissue and fluids from various parts of the Body.

1. The suction unit shall possess (or exceed) the following technical specifications:
    - Single rotary pump type
    - Free air flow: up to 30 LPM or better
    - Vacuum pressure from 0 to 1 bar at least, with an easy to read negative pressure gauge indicating actual pressure.
    - Low noise operation (≤ 45 dB @ 1 meter)
    - Incorporated bacteria filter (specify type) with 10 numbers.
    - Suction jar should be autoclavable.
2. Standard accessories should be listed in details with part number and quantities.

Power Supply

- Power input to be 220-240VAC, 50Hz fitted 13Amp plug.
- Should have DC Input
- Should have battery backup with which machine can be ran for at least 1 Hr

Standards, Safety and Documentation

- Should be FDA/CE marked
- User/Technical/Maintenance manuals to be supplied in English.
- List of important spare parts and accessories with their part number and costing.

Warranty:

- 12 months from date of installation and commissioning

Item 8: Cardiac monitor with capnography (wall mounted):

Specifications:

- Modular & Suitable for Adult/Pediatric/ Patients monitoring.
- Minimum 15 inches multi-color TET display screen.
- Eight Channel digital and waveforms/ traces display.
- Capability of storage of patient data and printing of patient reports.
- The Patient Monitor must have a provision for telemetry data transmission for central monitoring

Parameters

- Facility to monitor and display ECG, Respiration, NIBP, SpO2, EtCO2, Temp
- **ECG** Multichannel (up to 12 lead) ST segment analysis 3 or 5 lead with cascade waveform facility. Monitoring, Diagnostic & OT modes of monitoring of ECG Simultaneous Multi-lead ECG monitoring of 7 ECG lead HR range 20-350 BPM HR/PR Source selection facility from Automatic, Spo2 IBP and NIBP. Automatic arrhythmia detection & alarm for standard & lethal arrhythmia
- **Pulse Oximetry:** Nellcor or Masimo technology. Display of Plethysmograph with Pulse Strength indicator & SpO2 values & perfusion index. SpO2 Range – 1-100% PR Range – 20 to 230 BPM
- **ETCO2:** Should be Main Stream capnography with display of CO2 and digital Values of EtCO2, FiCO2 & RR. EtCO2 Range – 0-99 mmHg FiCO2 0 to 20 mmHg. Flow rate – 50ml/min Units – mmHg, KPA/Vol%

- **NIBP:** Measurement and display of systolic diastolic and mean pressure values of NIBP measurement for adult, child & neonate. User selectable alarm settings, Mode: Manual, STAT (continuous 5-minute operation) and automatic (selectable time interval 2-90 minutes). Range 20-250 mmHg.
- **Temperature:** Two channels and with two units (0c and 0F) selectable Temp. Range – 0- 50 Deg C. Option for differential temperature should be provided
- **Respiration:** RR range 1-150 bpm, Sourced through ECG cable or CO2. Priority to CO2. Apnea alarms should be provided.

Central monitoring system (if purchased):

- Display Monitor: Color LED touch screen with resolution of at least 1920 x 1080 pixels and at least 32-inch size
- Data reception must be through telemetry
- With licensed Operating System software
- Capable of receiving and displaying data simultaneously from at least 16 patient monitors
- v. Capable of trend review per patient
- Capable of alarm history review
- Capable of freezing data for further review and analysis
- Capable of graphic and tabular data trend presentation
- CPU: at least 2 processors with minimum of 4 cores and 4 threads, minimum of 2.6 GHz
- RAM: at least 16GB
- Video Card: atleast 4GB video RAM
- Hard drive/storage: atleast 2TB
- USB ports xiv. Licensed Operating System (OS)
- 220V, 50Hz xvi.
- Accessories: Keyboard, mouse, external speaker, Automatic Voltage Regulator, laser printer

Trends & alarms:

- 72 Hrs. graphical/tabular trends with zoom facility and separate dedicated trend for storing min 200 NIBP readings
- Should have multiple patient data storage facility.
- Auto-setting of alarm limits depending on present patient condition for all the parameters
- Should have Alarm recall facility for last 24 Alarm events with date, time and Message
- Should have facility to print Graphical trend, tabular trend and alarm recall.

Recorder: Inbuilt thermal printer should be available

Others: Defibrillator and cautery protection should be provided Should work on Mains as well as battery (backup for 2 Hrs.) Automatic zoom in Facility in the monitor display. Should have facility to download trend data on USB and SD Card.

Accessories:

- Lead ECG with clips – 2 sets
- NIBP Cuffs for Adult – 2, Child – 2 each
- EtCO2 module with all accessories.
- Esophageal/Rectal Temperature probe – 2 and skin temperature probe 1 per monitor.
- Reusable SPO2 probes adult 2 and pediatric 2 per monitor

Environmental factors:

- The unit shall be capable of operating continuously in ambient temperature of 10-40 deg c and relative humidity of 15-90%
- The unit shall be capable of being stored continuously in ambient temperature of 0-50 deg C and relative humidity of 15-90%

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Power supply:

- Power input to be 220-240 VAC, 50Hz fitted with 13A plug.
- Should have battery backup with which the machine can be ran for at least 2 Hrs.

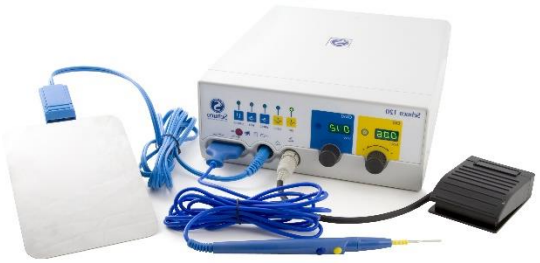
Standards, Safety and Training

- Should be FDA/CE approved product
- The unit and the accessories must be supplied with one year of warranty starting from the date of installation.

Documentation

- User/Technical/Maintenance manuals to be supplied in English.
- List of important spare parts and accessories with their part number and costing.
- Contact details of both local supplier and manufacture for service and maintenance and must be provided.

Item 9: Cautery machine: Used for cutting tissues and coagulate bleeding during surgeries



1. Microcontroller based isolated Electrosurgical Generator having both Monopolar and Bipolar outputs designed for all surgical procedures.
2. Smart generator should be able to monitor changes in tissue impedance continuously and adjusts power.
3. Monopolar outputs should have three cutting modes:
a. Low cut for delicate tissue or Laparoscopic cases having maximum power of 300w.
b. Pure cut for clean, precise cut in general surgery having maximum power of 200W.

c. Blend mode for cutting with homeostasis having maximum power of 200W
All cut modes should be able to adjust output power depending on tissue density by less than 15% or 5W, whichever is greater.
4. It should have three Coag Modes with maximum power of 120W
a. Desiccate mode for low voltage contact coagulation suitable for Laparoscopic and delicate tissue work.
b. Fulgurate mode for efficient non-contact coagulation in most applications.
c. Spray mode should have randomized spray effect of varying amplitude and frequency for coagulating large tissue areas with minimum depth of necrosis.
5. It should have three bipolar modes with maximum power of 70W
a. Precise mode have fine control of desiccation in delicate tissue.
b. Standard mode for applications at low voltage to prevent sparking.
c. Macro mode for applications on tissue with high resistance.
6. It should have patient plate monitoring facility and should give audiovisual alarm and deactivate output if contact between patient and patient plate is not proper to eliminate the risk of patient burns.
7. The unit should have two hand switching and Footswitch Monopolar outputs and one hand switching and foot switching bipolar output.
8. It should have membrane keyboard for power settings.
9. The unit should have individual digital display of power for Bipolar, Monopolar cut and Monopolar Coag.
10. The unit should not have RF Leakage current more than 150Ma

- **Accessories:**
  a. Monopolar Footswitch: - 02 No.
  b. Bipolar Footswitch: - 01 No.
  c. Reusable hand switching Pencil: - 02 Nos.
  d. Reusable Patient Plate: - 02 nos.
  e. Bipolar Forceps: - 02 No.
  f. Forceps Cord: - 02Nos.
  g. Universal Adaptor: - 01No.

Environmental factors:

- The unit shall be capable of operating continuously in ambient temperature of 10-40 deg c and relative humidity of 15-90%
- The unit shall be capable of being stored continuously in ambient temperature of 0-50 deg C and relative humidity of 15-90%

Power supply:

- Power input to be 220-240 VAC, 50Hz fitted with 13A plug.

Standards, Safety and Training

g. Should be FDA/CE approved product
h. The unit and the accessories must be supplied with two years of warranty starting from the date of installation.
i. Application training for doctors should be given within 2 months after installation

DOCMENTATION

j. User/Technical/Maintenance manuals to be supplied in English.
k. List of important spare parts and accessories with their part number and costing.
l. Contact details of both local supplier and manufacture for service and maintenance and must be provided.

Item 10: Anesthesia workstation

- The unit should be a cost-effective, flexible anesthesia workstation for performing and monitoring inhalation anesthesia, suitable for adult as well Child up to neonatal age
- It should be capable of providing low-flow techniques to minimize gas and anesthetic agent consumption for economical day-to-day operation

- The Anesthesia Workstation should have
    a. In-built Ventilator with Colored TFT display.
    b. Integrated CO2 Absorber.
    c. In-built & Integrated Anesthesia Gas Monitoring Facility
    d. Multi parameter monitor
    e. All these components should be of the same manufacturer or brand with their label on each component. Both anesthesia delivery system & multipara monitor must be US FDA approved & European CE Marked
- Should have CGO, axillary o2, manual breath and automatic ventilation functions
- The unit should have Powder Coated Steel Trolley with 4 Wheels & 2 or more Drawers & the front wheels should have a locking device.
- Machine should provide electronic gas mixing with digital control for O2, N2O and Air.
- Gas supply: - The unit should be able to connect to Central pipeline & there should be provision of PIN Index Yoke to connect to One Emergency Gas Cylinder of O2 & N2O each
- Emergency cylinder with OEM Connector should be supplied with the machine
- The unit should be equipped with Integrated Ratio System to maintain 23-25 Vol% O2 in Fresh Gas & on accidental opening of only N2O flow with O2 valve closed, the Ratio system should automatically Open O2 Valve to maintain 25 Vol% O2 in Fresh Gas.
- The unit should have Water & Particle trap to the inlet Central Gas Pipe-line connections of O2, N2O & AIR.

- **Patient Module**:
    1. It should have fully autoclavable patient module having anodized metallic casing
    2. It should have 34°C Heated Patient Module to deliver Warm Fresh Gas to Patient & to prevent condensation

3. The Patient Module should have Pressure Graduated Metallic APL Valve, Inspiratory Valve, Expiratory Valve, a Controlled Room Air Valve & Active Gas Scavenging Port.

- CO2 Absorber: Patient Module should be integrated to the CO2 absorber & CO2 absorber should be Single/Double chamber design having screw type threading for easy removal & re-fitting
- O2 Flush: - The unit should have O2 Flush facility to give approximately 50Ltr/min flow.
- Common gas outlet: - The unit should have Common Gas Outlet for using open circuit & the unit should have easy change over from open circuit to closed circuit or vice-versa.
- Vaporizers: - It should have provision to connect Two vaporizers & the unit should be provided with Two vaporizers equivalent to one of Isoflurane& One of Sevoflurane.
- Inbuilt Anesthesia Ventilator: - It should have Integrated Microprocessor Controlled & electronically Driven Ventilator
- Modes: - It should offer Ventilation Modes such as Manual, Spontaneous, CMV Adult & CMV Child & PCV Adult & PCV Child, SIMV & PSV
- I:E ratio: - The unit should offer I/E Ratios: 1:1, 1:1.5, 1:2, 1:2.5, 1:3, 1:4, 1:5 with I/E Inverse Ratios: 2:1, 3:1 & 4:1
- Display: - It should have a high contrast color TFT Display.
- Self-test: - It should be equipped with self-test routines and automatic calibration of all sensors
- Display: - Display should indicate measured values: O2 (Paramagnetic), real time capnograph,anestheticagents(HALOTHENE/ISOFLURANE/SEVOFLURANE/ENFLURANE/DESF LURANE), Tidal Volume, Minute Volume, Frequency, PEEP, Mean pressure-in graphic form with numerical display
- MAC: - It should have a display of MAC (Minimum Alveolar Concentration).

- Gas Monitoring: - The In-built Anesthesia Gas Monitoring Facility should based on side-stream technology, using Infrared Photometry Principal & also it offer Automatic Anesthetic Agent Identification.
- The unit should offer In-built Anesthesia Gas Monitoring with CO2 Et. & In, N2O In & Et, O2 (paramagnetic) In & Et, and Anesthetic agent
- It should have a display of MAC (Minimum Alveolar Concentration).
- It should have clear alarms and user information as text messages. It is essential that unit should prompt user for corrective action rather than giving only alarm with no diagnostic message
- The unit should perform the Leak Test & Sensor Test on Start of the unit to know the leak volume or dead space volume of tubing etc. & thus deliver exact Tidal Volume to the Patient.
- **Specification of multipara monitor:**
    1. Should be capable of Monitoring Heart rate, SPO2, NIBP, ECG, Temp, RR and IBP2(Upgradable to 4), NMT, BIS/ENTROPY
    2. Should have a Display of 15 inch and above diagonal color TFT display.
    3. Should have 8 waveform fields.
    4. Should have provisions to connect 3 or 5 Lead ECG cables
    5. Should have NIBP measurement by Oscillometric method. - Should have Manual / Automatic modes of measurement. - Should have a measurement range of 20 to 250 mm Hg.
    6. Should have 2 channel Invasive Blood pressure (IBP) measurement
    7. Should have provision for Two temperatures with display of T1 and T2
    8. Should have Respiration by Impedance method
    9. It must use Nellcor /Masimo technology to measure oxygen saturation for accuracy during motion artifacts, low
    10. perfusion states like shock, bradycardia and hypothermia
    11. Should have SPO2 measurement with plethysmograph, digital value & perfusion index and SPO2 values with range 50% to 100%. and SPO2 values with range 50% to 100%.

12. Should have Alarm facility for HR limits, Arrythmia, ST Segment Limit, and all other parameter limits.
13. Integrated Neuromuscular Transmission Monitoring in the primary monitor with all accessories. Display should be in the primary monitor
14. Depth of Anesthesia Monitoring module -- BIS/Entropy with BIS/Entropy all accessories &50 sensors
15. Facility to store snapshots during critical events for waveform review at a later stage.
16. Audio visual and graded alarming system.
17. It should provide slave display of 15 inches and above with cable

- **System Configuration Accessories, spares and consumables: -**
    1. 3 Lead ECG cable - 01nos. & 5 Lead ECG cable with cords- 01nos.
    2. SPO2 finger probe for Adult and Pediatric application. - 1each along with 2 connecting cable.
    3. SpO2 Neonatal Probe – 1 Nos
    4. NIBP cuff for conventional Adult, extra-large for adult and for Pediatric application – 1 each.
    5. IBP Reusable cable – 2 Nos
    6. Disposable IBP pressure transducers – 50 Nos
    7. 2 Temperature Probes
    8. Depth of Anesthesia Sensors-50
    9. Accessories for neuromuscular transmission monitor-01 set (ped and adult)
    10. Disposable Adult & Pediatric circuits-50 each. 11. HME filters-50

Power Supply

- 220-240 V, 50 Hz
- Should have battery backup
- Should supply appropriate UPS

Standards, Safety and Training

- Should be FDA approved/ CE marked

- Application training must be provided to the clinical staff
- Manufacturer standard biomedical technical must be given to URH Biomedical Engineers within 2 months of installation.

Documentation

- User/Technical/Maintenance manuals to be supplied in English.
- List of important spare parts and accessories with their part number and costing.

Warranty:

- 24 months from date of installation and commissioning.

Item 11: CPR Bed

- The system must have electrically operated five function and adjustable height and tilt. It must also have option for CPR positioning and a radio translucent top for carrying out X-Ray at the Bedside.
- The bed must have an open-architecture design for quick and easy cleaning, helping to reduce the risk of infection.
- Must have retracting side rails to prevent patient entrapment and falls.
- Must have zero gaps for safe and easy patient transfers.
- must have actuator control for movement (Including CPR positioning) with hand control (remote control) and Side rail embedded patient control

- Must have back rest rising 0 to 75˚
- Must have knee rising from 0 to 45˚
- The under-bed clearance approx. 5.5”
- Must have Trendelenburg 0 to 15˚and reverseTrendelenburg0 to 15˚.
- Must have angle indicator on side rail for trend and reverse trend.
- Must have central Brakes system accessible from all four corners of the bed.
- Must have dual sides Manual CPR and electric CPR
- Should have four corners crash bumper, One handed release split side rail and Total lock castors
- Must have 4 positions IV Pole holder
- must have battery backup facility for electric functionality
- Dimensions of bed:

  Overall Length: Approx 220cm

  Overall Width: Approx 105cm

  Auto regress on backrest: Approx 10cm

  Auto regress on leg: Approx 10 cm
- Height: Approx.40 – 80cm
- The working load capacity of unit should be at least 250Kg.
- Shall provide with one, four section mattress of suitable dimensions with washable cover of good quality. The mattress must be made of high density PU foam of 12cm thickness with Anti-Microbial agent incorporated into all components. Mattress must be fully radiolucent for ease in performing X-rays
- **Accessories and consumables:**

  All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning and lubrication materials, to be included in the offer. Bidders must specify the quantity of every item included in their offer (including items not specified above)

- **Power Supply**

  1.Power input to be 220-240VAC, 50Hz fitted 13Amp plug.

- **Standards, Safety and Training**
    1. Should be FDA/CE approved product
    2. The unit and the accessories must be supplied with one year of warranty starting from the date of installation.
- **Documentation**
    - User/Technical/Maintenance manuals to be supplied in English.
    - List of important spare parts and accessories with their part number and costing.
- Contact details of both local supplier and manufacture for service and maintenance and must be provided

Item 12: Portable ventilator

- Time-cycled, volume controlled and pressure limited emergency ventilator for the controlled ventilation of patients of all sizes.
- Ventilator should be compact, light in weight and easy to carry.
- The ventilator must have integrated handle for lifting and carrying by hands as well as quick latching to all common rail and pole profiles.
- Accessories: Minimum of 2 sets of reusable Breathing sets for Adult, Pediatric and neonatal each. (including reusable/autoclavable flow sensor if it is to be attached in the tubing)
- Accessories: Oxygen Regulator compatible with the Ventilator hose connection.
- Ventilation facilities available: Adjustable Tidal volume (starting from neonatal range), Breathing rate, Airway pressure, Oxygen (21 to 100) %.
- Modes Available: CMV, SIMV, C-PAP, BiPAP, IPPV

- Manual breath function should be available
- Built-in air source such as turbine
- Ranges of parameter settings:
    - 21-100 %Fio2
    - Insp. Flow Rate:10 to 130 LPM
    - Insp. Flow waveform: User selectable. Square 7 decelerating.
    - Resp.Rate.2 to 70 BPM
    - Inspiratory time:0.3 to 7 sec
    - Insp.Pause time;0.1-2 sec
    - I: E Ratio: 1:4-4:1
    - Insp. Tidal Volume :20-2000 ml
- Pressure limit (Pop off):20-120 cm H2o
    - PEEP:0-35 cm H2O
    - Pressure Support: 0-60 cm H2O
    - Pressure Control :0-80cm H2O
    - Flow cycle for PSV &PC:0,5to 30 %
    - Apnea Time:10 to60 sec
    - Apnea Back Rate :12 BPM onwards
    - Flow Trigger:1-15 LPM
- Unit must work with low flow oxygen input connections as well.
- Inbuilt Measured & monitored parameters & trends on Display:
    - Driving gas supply pressure (air/oxygen)
    - Fio2
    - Resp. rate: Ventilator & patient
    - I:E ratio
    - Inspired tidal volume: Ventilator & patient
    - Expired tidal volume: Ventilator & patient
    - minute volume: Ventilator & patient
    - h. Airway pressures: P-max, Mean & P plateau
- PEEP
- Auto PEEP
- Apnea

- Both audible and visual alarms for Supply Pressure Low, Airway Pressure High and Airway Pressure Low.
- The device should be supplied with the ambulance/airplane mount complying to the same standard as the ventilator if necessary.
- Documents validating the airplane compatibility from the manufacturer and the local airlines must be supplied.

Circuits and accessories:

- Test lungs from neonatal- adult range must be provided
- Two reusable circuits and other accessories in 2 sets.
    - c.10 Disposable circuits to be supplied Test lungs from neonatal- adult range must be provided
- All other Standard accessories to start the service of the equipment must be provided.

Power Supply

- Battery Back UP for more than 5 hours, DC connectivity. AC charger of 220V 50Hz to be included

Standards, Safety and Training

- Should be FDA approved/ CE marked
- Application training must be provided to the ICU Nursing staff
- Manufacturer standard biomedical technical must be given to URH Biomedical Engineers within one year of installation.

Documentation

- User/Technical/Maintenance manuals to be supplied in English.
- List of important spare parts and accessories with their part number and costing.
- **Warranty:**
- 24 months from date of installation and commissioning.

Item 13: CPR machine: Used to provide automated chest compressions to sudden cardiac arrest (SCA) victims.

- Should be easy to position – easy to operate
- Should have a buckle system so that a single person can easily attach the device
- Should support Continuous and 30:2 cycles operation
- Compression rate should be adjustable in continuous mode
- Should support Adjustable depth (In the clinically relevant range) and be fixed during operation
- Should have Audible CPR timer
- Should have automatic and manual positioning of the start point

Accessories:

- All the accessories needed for the operation and storage of the device should be supplied

Environmental factors:

- The unit shall be capable of operating continuously in ambient temperature of 10-40 deg c and relative humidity of 15-90%
- The unit shall be capable of being stored continuously in ambient temperature of 0-50 deg C and relative humidity of 15-90%

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Power supply:

- Power input to be 220-240 VAC, 50Hz fitted with 13A plug.
- Should have a DC Input connection
- Should have battery backup with which the machine can be ran for at least 1 Hrs
- Extra battery and external battery charger should be supplied

Standards, Safety and Training

- Should be FDA/CE approved product
- The unit and the accessories must be supplied with two years of warranty starting from the date of installation.
- The bidder should be responsible for conducting the installation and application training for the clinical staffs
- Technical training should be provided for the Biomedical engineering team of URH
- **Documentation**
- User/Technical/Maintenance manuals to be supplied in English.
- List of important spare parts and accessories with their part number and costing.

- Contact details of both local supplier and manufacture for service and maintenance and must be provided

Item 14: Electrical examination table: A powered platform with the ability to raise and lower either the entire table or individual parts in order to position and support patients during medical examinations and/or treatments using a foot or hand control

- Should be electrically adjustable

- Should have remote or footswitch control
- Should be ergonomic and of modern design
- Two section design
- Examination should be possible even in standing position
- Height and headrest should be adjustable
    - Head rest adjustment from -27° up to +40°.
    - Height: Max.: 980 mm (38.6 in)
        - Min.: 580 mm (22.8 in)
- Trendelenburg- and Anti-Trendelenburg adjustment from -22° up to +22° should be available
- Minimum length: 75 inches
- Minimum width: 25 inches

- **Power Supply:**
- Line voltage 220-240AC, 50-60Hz and fitted with a 13amp plug.

- **Standards, Safety, Warranty and Training**

- Should be FDA/ CE marked product
- Application training must be provided to the users.
- Should be provided 12 Months warranty from the date of installation.

- **Documentation**

- User/Technical/Maintenance manuals to be supplied in English.
- List of important spare parts and accessories with their part number and costing
- Contact details of both local supplier and manufacture for service and maintenance are must

Item 15: Video laryngoscope

- Fiber optic Laryngoscope with LCD (Or better) Display
- Monitor should be attached to the handle
- Should support both disposable and reusable blades
- Should have provision to insert all sizes of endotracheal tube
- Should have a provision to introduce all sizes of suction catheters
- The main body of the handle should incorporate an excellent grip
- Should have an LCD screen of minimum size 3" Full View, Resolution Ration 640x480 RGB, Aspect Ratio 4:3 or better
- Should support both disposable and reusable blades
- Reusable blades to be surgical grade stainless steel and autoclavable Supplied in protective case
- Should be light weight

- **Accessories:**
- **Miller blades of size 0,1**
- **Macintosh blades of all sizes**
- If the blades are disposable, should supply 50nos. of blades compatible for both adult and pediatric along with each unit.
- If light source is of replicable lamps, spare lamps has to be provided
- **Power Supply:**
- Should have rechargeable batteries with minimum 1Hr backup
- Should provide extra batteries

- **Standards, Safety, Warranty and Training**

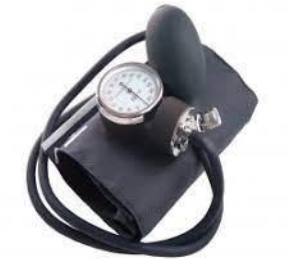
- Should be FDA/ CE marked product
- Application training must be provided to the users.
- Should be provided 12 Months warranty from the date of installation.

- Manufacturer standard biomedical technical must be given to URH Biomedical Engineers within one year of installation.

- **Documentation**

- User/Technical/Maintenance manuals to be supplied in English.
- List of important spare parts and accessories with their part number and costing
- Contact details of both local supplier and manufacture for service and maintenance are must

Item 16: Aneroid BP apparatus



- **Functionality and Performance**

- Mobile (Aneroid) sphygmomanometer used to manually measure patient's blood pressure.
- Large approximately 15 cm aneroid blood pressure gauge, with scale ranging from 0 to 300 mmHg, with clear dial, numbers, and face
- The cuff, gauge, and bulbs should be made of heavy-duty materials that withstand harsh environment.
- The bulb should have a metal air release valve.
- Cuff sizes: 3 sizes, adult (L and XL) and pediatric, one of each must be included.
- Spare cuff (of each size) and bulb must be provided.
- Standard accessories shall be included
- Shall be CE marked and/or FDA approved.

- **Trainings and Warranty:**

- The unit and the accessories must be supplied with one year of warranty.

Item 17: Macintosh laryngoscope full set

- Blades of all sizes should be supplied (Infant – Adult)

Item 18: McCoy laryngoscope full set

- Blades of all sizes should be supplied (Infant – Adult)

Item 19: Cardiac monitor with rolling stand

- **Specifications:**
- Modular & Suitable for Adult/Pediatric/ Patients monitoring.
- Minimum 12 inches multi-color display screen.
- Requires the basic 5 parameters
- Capability of storage of patient data and printing of patient reports.
- Should be supplied with rolling stand and attaching plate

- **PARAMETERS**
- Facility to monitor and display ECG, Respiration, NIBP, SpO2, Temp

- **ECG** Multichannel (up to 12 lead) ST segment analysis 3 or 5 lead with cascade waveform facility. Monitoring, Diagnostic & OT modes of monitoring of ECG Simultaneous Multi-lead ECG monitoring of 7 ECG lead HR range 20-350 BPM HR/PR Source selection facility from Automatic, Spo2 IBP and NIBP. Automatic arrhythmia detection & alarm for standard & lethal arrhythmia
- **Pulse Oximetry:** Nellcor or Masimo technology. Display of Plethysmograph with Pulse Strength indicator & SpO2 values & perfusion index. SpO2 Range – 1-100% PR Range – 20 to 230 BPM
- **NIBP:** Measurement and display of systolic diastolic and mean pressure values of NIBP measurement for adult, child & neonate. User selectable alarm settings, Mode: Manual, STAT (continuous 5-minute operation) and automatic (selectable time interval 2-90 minutes). Range 20-250 mmHg.
- **Temperature:** Two channels and with two units (0c and 0F) selectable Temp. Range – 0- 50 Deg C. Option for differential temperature should be provided
- **Respiration:** RR range 1-150 BPM Sourced through ECG cable. Apnea alarms should be provided.

- **Trends & alarms:**
- 72 Hrs graphical/tabular trends with zoom facility and separate dedicated trend for storing min 200 NIBP readings
- Auto-setting of alarm limits depending on present patient condition for all the parameters
- Should have Alarm recall facility for last 24 Alarm events with date, time and Message
- Should have facility to print Graphical trend, tabular trend and alarm recall.
- **Recorder:** Inbuilt thermal printer should be available
- **Others** Defibrillator and cautery protection should be provided should work on Mains as well as battery (backup for 2 Hrs.) Automatic zoom in Facility in the monitor display. Should have facility to download trend data on USB and SD Card.
- **Accessories**:
- Lead ECG with clips – 2 sets
- NIBP Cuffs for Adult – 2, Child – 2 each

- Esophageal/Rectal Temperature probe – 2 and skin temperature probe 1 per monitor.
- Reusable SPO2 probes adult 2 and pediatric 2 per monitor
- Rolling stand

- **Environmental Factors**:
- The unit shall be capable of operating continuously in ambient temperature of 10-40 deg c and relative humidity of 15-90%
- The unit shall be capable of being stored continuously in ambient temperature of 0-50 deg C and relative humidity of 15-90%

- **Power supply:**
- Power input to be 220-240 VAC, 50Hz fitted with 13A plug.
- Should have battery backup with which the machine can be ran for at least 2 Hrs
- **Standards, Safety and Training**
    - Should be FDA/CE approved product
    - The unit and the accessories must be supplied with one year of warranty starting from the date of installation.

    - **Documentation**
    - User/Technical/Maintenance manuals to be supplied in English.
    - List of important spare parts and accessories with their part number and costing.
    - Contact details of both local supplier and manufacture for service and maintenance and must be provided.

Item 20: Stethoscope: pediatric (Littman)

- Bell and diaphragm type
- Tight and soft sealing ear tips
- Diaphragm should be tunable
- Chest piece material: stainless steel
- Spare ear tips, diaphragm and ring has to be provided

Standards, Safety and Warranty

- Should be a CE / FDA Approved product and should have ISO standards
- Warranty of 12 months from the date of handing over or installation and commissioning

Item 21: Stethoscope: pediatric cardio 3 (Littman)

- Bell and diaphragm type
- Tight and soft sealing ear tips
- Diaphragm should be tunable
- Chest piece material: stainless steel
- Spare ear tips, diaphragm and ring has to be provided

Standards, Safety and Warranty

- Should be a CE / FDA Approved product and should have ISO standards
- Warranty of 12 months from the date of handing over or installation and commissioning

Item 22: Stethoscope: adult (Littman)

- Bell and diaphragm type
- Tight and soft sealing eartips
- Diaphragm should be tunable
- Chest piece material: stainless steel
- Spare eartips, diaphragm and ring have to be provided

Standards, Safety and Warranty

- Should be a CE / FDA Approved product and should have ISO standards
- Warranty of 12 months from the date of handing over or installation and commissioning

Item 23: Stethoscope: adult cardio 3 (Littman)

- Bell and diaphragm type
- Tight and soft sealing eartips
- Diaphragm should be tunable
- Chest piece material: stainless steel
- Spare eartips, diaphragm and ring have to be provided

Standards, Safety and Warranty

- Should be a CE / FDA Approved product and should have ISO standards
- Warranty of 12 months from the date of handing over or installation and commissioning

Item 24: Fingertip pulse oximeter - pediatric

- Continuous non-invasive monitoring of functional oxygen saturation (Sp02)
- Should be light weight for easy transport.
- Measurement Range:
    - Sp02 Saturation Range 70% to 100%
    - Accuracy (%SpO2) ±2% at80%~100%, ±3% at 70%~79%
    - Pulse Rate Range 30 to 250 beats per minute (bpm)
    - Accuracy ± 1 bpm at 30~250 bpm
    - Should display Sp02, HR and Battery status on the screen
- Safety/Alarms
    - Audible and visual alarms for high/low pulse rate and sensor off.
- Battery operated (Alkaline batteries).

- **Standards, Safely, Training and warranty**

    - Should be a CE / FDA Approved product and should comply with ISO standards
    - 12 months from the date of handing over or installation and commissioning

Item 25: Fingertip pulse oximeter - adult

- Continuous non-invasive monitoring of functional oxygen saturation (Sp02)
- Should be light weight for easy transport.

Measurement Range:

- Sp02 Saturation Range 70% to 100%
- Accuracy (%SpO2) ±2% at80%~100%, ±3% at 70%~79%
- Pulse Rate Range 30 to 250 beats per minute (bpm)

- Accuracy ± 1 bpm at 30~250 bpm
- Should display Sp02, HR and Battery status on the screen

- Safety/Alarms
  - Audible and visual alarms for high/low pulse rate and sensor off.
- Battery operated (Alkaline batteries).

Standards, Safely, Training and warranty

- Should be a CE / FDA Approved product and should comply with ISO standards

12 months from the date of handing over or installation and commissioning

Item 26: Forehead IR thermometer

- sensible temperature should be in the range: 35°c~43°c (95°f~109.4°f or better
- Accuracy should be: ±0.3°C (±32.54°F) or better
- Repeatability: 1% of reading or 1°C
- Response time: 500 mSec, 95% response or better
- Working environment should be 15°C~40°C (59°F~104°F)
- Operating Humidity: 10~95%RH non-condensing
- Storage Temperature: -20°C ~ 60°C (-4°F~140°F)
- Power Supply: should be running with primary batteries
- Should be light weight

Standards, Safely, Training and warranty

- Should be a CE / FDA Approved product and should comply with ISO standards
- 12 months from the date of handing over or installation and commissioning

Item 27: Nebulizer (Heavy duty)

- It should be a heavy duty/hospital use, compressor type nebulizer.
- Aerosol output should at least 0.45 ml.
- Should have a dust filter.
- Should be able to deliver a flow rate ≥ 7 LPM
- Should have air pressure ≥ 35 psi.
- Should have a check valve to protect the device against contamination due to backward inhalation.
- Should be compatible for continuous use.
- Should works on 200-240Vac/50Hz.
- Should be supplied with nebulization accessory kit with mask for adult and pediatric – 2 nos. each.
- Nebulization mask for adult and pediatric – 10 nos. each.
- Standard accessories should be listed in details with part number and quantities.

- **Power Supply**
- Power input to be 220-240VAC, 50Hz fitted 13Amp plug.
- **Standards, Safety and Documentation**
- Should be FDA/CE marked
- User/Technical/Maintenance manuals to be supplied in English.
- List of important spare parts and accessories with their part number and costing.
- **Warranty:**
- **12 months from date of installation and commissioning.**

Item 28: Digital Thermometer

1. Should be suitable for oral and auxiliary use.
2. Clinical Measuring Range at least of 35-42 °C
3. Accuracy ÷/- 0.5°C / °F or better
4. Digital display window to show temperature in °C / °F
5. Measuring time, no greater than 10sec.
6. Should be battery operated.
7. Battery life at least of 1000 takes
8. Auto shut-off.
9. Water and disinfectant resistant.
10. Standard accessories shall be included.
11. Shall be CE marked and/or FDA approved.
12. Should include 1000 disposable covers/sleeves.

Trainings and Warranty:

1. The unit and the accessories must be supplied with one year of warranty.

Item 29: Patient warmer

- **Specifications:**
- Should be of forced air technology
- It should be microprocessor controlled
- Should provide safe, quiet and effective warming to the patient
- It should be suitable for intra operative as well as post-operative ICU applications
- Control panel should display set and actual temperature
- Should have temperature sensor at machine outlet as well as at blanket end
- Should be suitable for adult and pediatric patients
- Should have 34C default setting additionally with 4 set temperature & preset programs and overheating protection
- Should have Air flow settings from 30-50 cfm with corrugated single hose with < 0.3-micron air filter with minimum 1000 hours life.
- There should be washable protective hose cover
- Should have anti-bacterial, blood and fluid resistive covers
- Should be light weight and easy to transport
- Reusable accessories required:
- Upper body for adult
- Lower body for adult
- Torso blanket for adult
- Upper body for pediatric
- Lower body for pediatric
- Optional leg, arm and shoulder sleeves

- **Power Supply**
    - Power input to be 220-240VAC, 50Hz fitted 13Amp plug.
- **Standards, Safety and Training**
    - Should be FDA/CE approved product
    - The unit and the accessories must be supplied with one year of warranty starting from the date of installation.
- **Documentation**
- User/Technical/Maintenance manuals to be supplied in English.
- List of important spare parts and accessories with their part number and costing.
- Contact details of both local supplier and manufacture for service and maintenance and must be provided.

Item 30: BiPAP machine

- Should be a handy and portable, light weight device for providing NIV for patients
- Should essentially have the following modes – BIPAP(ST), Auto CPAP & CPAP (Spontaneous)
- Should incorporate latest algorithms for leak compensation and synchronization.
- Should have a display for real time monitoring of tidal volume, respiratory rate, I: E ratio, Delivered IPAP and EPAP.
- Should include user adjustable alarms and essential nonadjustable fixed alarms for patient safety.
- Should include alarms for leak, apnea, patient circuit disconnection, low internal battery etc. 7. Should be able to provide adequate pressure ranges for IPAP, EPAP for patients (kindly mention the pressure ranges for IPAP, EPAP that can be delivered by the machine)
- Should have provision for inspiratory and expiratory trigger sensitivity adjustment
- Should have provision for inspiratory and expiratory slope adjustments
- Shall have built in internal battery for 8 hrs. of back up at a minimum 10 mbar pressure
- Accessories to be supplied:
- Patient Circuit & Mask Reusable: 1 set each (Adult & Pediatric)
- Patient Circuit & Mask Disposable: 10 Set each (Adult & Pediatric)
- Should have humidification facility. If an external humidifier is supplied, suitable tubing also need to be provided
- **Environmental factors**
- The unit shall be capable of operating continuously in ambient temperature of 20-30 deg C and relative humidity of 15-90%.
- **Power Supply**
- Power input to be 220-240VAC, 50Hz fitted 13Amp plug.

- **Standards, Safety and Training**
- Should be FDA approved/ CE certified
- Manufacturer should have ISO certification for quality standards.
- The unit and the accessories must be supplied with one year of warranty starting from the date of installation
- System should be supplied with all reusable accessories
- Application training must be provided to the users.
- Manufacturer standard biomedical technical must be given to URH Biomedical Engineers within one year of installation.

- **Documentation**
- User/Technical/Maintenance manuals to be supplied in English.
- List of important spare parts and accessories with their part number and costing.
- Contact details of both local supplier and manufacture for service and maintenance and must be provided.

Item 31: Cast Cutter with Suction

- should have variable speed control from standard to high speed.
- Should have minimum 10700 cpm in Standard mode
- Should have minimum 15900 cpm in High-Speed mode
- Can work on operational temperature between 50 to 104 F or 10 to 40 degree C
- Should be used with Vacuum or plugged directly into wall mains power.

- Should cuts on both backward and forward strokes of approximately 1/8" (3.2 mm) excursion
- Blades should be available of Stainless steel (30 pc), Nitride blades (30pc) & Titanium Nitride Blades (30 pc)
- Should have efficient DC Motor With speed feedback
- No requirement of any lubricant for life time
- Should have Quick Change Blade Mount assembly, USFDA Approved Company.

Vacuum Pump for Cast Cutter

- Should be attached to the cutter module
- Cast Cutter should be Quick Connect to Vacuum unit
- Vacuum should automatically turns on when Cast Cutter is activated.
- Impact Resistant Housing
- Should have Integral Vacuum Housing for reduces overall size while improving Balance and mobility
- Should have Detachable Canister Lid. Should have Quick ai4y emptying of dust collection filter
- Should have Tool Bracket for conveniently storing tool on back of stand
  Should have four/five wheel mobile stand for easy mobility
- Should have Swivel hose Mount allows for easy movement of the VAC Hose
- Should have maximum weight of 6.1-8 Kgs.
- Can work on operational temperature between 50 to 104 F or 10 to 40 degree C
- Cord length should not less than 2.5 meter

Accessories:

- Multiple blades of different sizes has to be supplied
- Spare dust filter has to be provided

Power Supply:

- Line voltage 220-240AC, 50-60Hz and fitted with a 13amp plug.

Standards/Certification, Safety:

- Both the cutter and vacuum pump should be a CE / FDA Approved product and should have ISO standards
- Class II and BF type equipment

Warranty:

- 12 months from the date of handing over or installation and commissioning

Other:

- User/Technical/Maintenance manuals to be supplied in English and certificate of calibration and inspection.
- Contact details of local supplier has to be provided

Item 32: Examination light with rolling stand

- Should be LED based examination light with rolling stand
- Light output should be homogenous
- Control panel should have ON/OFF button and illumination control from 30 – 100 %
- Should be fitted with a sterilizable handle
- tilting function for better positioning should be available
- illumination at a distance of 1 meter > 50000 Lux
- working range :70 140 cm or better
- average LED life should be more than 40000 hrs.

Power Supply

- Power input to be 220-240VAC, 50Hz fitted 13Amp plug

Standards, Safety and warranty

- Should be FDA/CE approved product
- The unit and the accessories must be supplied with one year of warranty starting from the date of installation.

Documentation

- User/Technical/Maintenance manuals to be supplied in English.
- List of important spare parts and accessories with their part number and costing.
- Contact details of both local supplier and manufacture for service and maintenance and must be provided.

Item 33: Vital sign monitor with rolling stand

- **Specification**

- Fast and accurate readings with LCD display
- Measure the vital parameters from Pead to Adult range.
- Inbuilt rechargeable battery with minimum 8 Hrs. operation time.
- User friendly, mobile and shock resistant.
- Parameters: NIBP, SPO2, Pulse rate and Temperature.
- **SpO2**
    - Manual or continuous monitoring
    - Waveform and numerical display
    - Range: 70-100%
    - Accuracy (%SpO2) ±2% at100%~80%, ±3% at 80%~70%

Temperature

- forehead/Ear thermometer
- Range: 20 – 50°C
- Accuracy: +/- 2 °C

NIBP

- Adult / pediatric measurement range:
- Systolic 30-255 mmHg
- Diastolic 15-220 mmHg
- Mean 20-235 mmHg

- BP accuracy: +/- 3 mmHg
- Should include 3 sizes of NIBP cuffs; Adult (L&XL) and pediatric
- Should include Spo2 cable with sensor probe.
- Should include Thermometer.
- Should include Mobile stand with lockable castor wheels.
- Standard accessories shall be included

- **Power Supply**
    - Power input to be 220-240VAC, 50Hz fitted 13Amp plug.

- **Standards, Safety and Training**
- Should be FDA approved/CE marked
- Application training must be provided to the users.

- **Documentation**
- User/Technical/Maintenance manuals to be supplied in English.
- List of important spare parts and accessories with their part number and costing.
- **Warranty:**
- At least 12 months from date of installation and commissioning

Item 34: ECG machine with trolley

- 12 lead multi-channel digital ECG machine capable of operating on dual power
- Lead standard: 12 lead ECG and simultaneous acquisition of 12 lead ECG data
- Should have complete digital filter to avoid baseline drifting and interfering from AC
- Machine should have ECG interpretation on record
- Should have acceptable storage to save at least last 20 ECGs

- LCD screen displaying settings, operation menu and ECG waveforms
- Built in high resolution thermal printer
- ON/OFF switch and power indicator should be available
- Floating input circuit protection from defibrillation and pacemaker
- Automatic and manual operating modes
- The unit should detect lead off and display.
- Mobile Cart with cord hanger has to be supplied with equipment

Power Supply:

- Line voltage 220-240AC, 50-60Hz and fitted with a 13amp plug.
- Should have battery backup which supports at least 1 hour operation without power

Standards/Cortication, Safety:

- Should be a CE / FDA Approved product and should have ISO standards

Warranty:

- 12 months from the date of handing over or installation and commissioning

Other:

- User/Technical/Maintenance manuals to be supplied in English and certificate of calibration and inspection.

Item 35: otoscope: An electrically powered, hand-held device designed for examination of the outer ear canal and tympanic membrane (eardrum) by direct viewing through the ear opening.

- Should have a Handle with a built-in LED light source in a mounted head
- Should have a rotatable viewing lens with a magnification between 3 times.
- Colour temperature: Cool white
- Handle should contain on/off switch.

- Should be light weight
- Should be battery operated (AA will be convenient)
- Should Include a port to connect an insufflation bulb

Accessories:

- Instructions for assembly, use and maintenance in English, French and Spanish.
- 1 x Plastic protective hard case containing full set.
- 2 x Sets of four reusable plastic specula different diameters ranging from 2 to 5mm.
- 1 x Set suitable disposable alkaline batteries.
- 1 x Bulb and tube for pneumatic tests.

Environmental conditions:

- Storage conditions: -10 - 55°C / 10 - 95% RH.
- Operating conditions: 10 - 35°C / 30 - 90% RH.
- Atmospheric pressure: 700hPa – 1060hPa.

Standards, Safety and warranty

- Should be FDA approved/CE marked
- 1 year warranty

Item 36: Ophthalmoscope: An electrically-powered, hand-held, ophthalmic instrument designed to be held close to the patient's eye to examine the interior of the eye and related structures

- Ophthalmoscope set composed of diagnostic head mounted on a handle.
- Range of lenses not smaller than -35D to +40D, adjustable in steps

- Should have Anti-reflection lens.
- Should be able to magnify at least five times.
- Available apertures at a minimum: small, large and semi-circle, fixation star.
- Colour temperature: Cool white.
- Should have Red-free, blue, and green filters.
- Handle with on/off switch.
- Illumination should be by a LED light source.
- Should be able to withstand frequent cleaning and disinfecting with hospital grade products

Accessories:

- 1 x plastic protective hard case or strong protective pouch containing full set.
- 1 x set of suitable disposable alkaline batteries.

Environmental conditions:

- Storage conditions: -10 - 55°C / 10 - 95% RH.
- Operating conditions: 10 - 35°C / 30 - 90% RH.
- Atmospheric pressure: 700hPa – 1060hPa.

Standards, Safety and warranty

- Should be FDA approved/CE marked
- 1 year warranty

Item 37: Weighing scale

- **Specification**

    - Battery operated (Alkaline) for ease of use
    - Capacity minimum: 150kg • Accuracy: 100g
    - Platter Size: 350 mm x 300 mm
    - The Electronic Adult Weighing Scale should incorporate following features for user-friendly convenience.
        - Digital Display
        - TARE facility with zero function.
        - HOLD function to lock the weight.

- **Standards, Safety and Warranty**
- Should be a CE / FDA Approved product and should have ISO standards
- Warranty of 12 months from the date of handing over or installation and commissioning

Item 38: wall mount diagnostic set: Wall-mounted, composed of ophthalmoscope, otoscope, nasal speculum, electronic thermometer (Forehead and ear type), storage box and hanging plate, etc. The battery handle is sharing.

- Should contain an Otoscope, ophthalmoscope, digital thermometer and aneroid BP apparatus
- BP apparatus should have a large dial
- Technical specification of otoscope: Refer item 35
- Technical specification of ophthalmoscope: Refer item 36
- Technical specification of ophthalmoscope: Refer item 16

Power Supply

- Power input to be 220-240VAC, 50Hz fitted 13Amp plug.

Standards, Safety and warranty

- Should be FDA/CE approved product
- The unit and the accessories must be supplied with one year of warranty

Documentation

- User/Technical/Maintenance manuals to be supplied in English.
- List of important spare parts and accessories with their part number and costing.
- Contact details of both local supplier and manufacture for service and maintenance and must be provided.