ANNEXURE-III

	Specification for Dual Frequency Single Beam Echo Sounder (Quantity – 1 Set)
Description	Dual Frequency Single Beam Echo Sounder (DFSBES) use to measure the depth of the seabed using the properties of acoustic waves. The time lag between the sound being emitted and the returning echo is used to calculate the water depth beneath the boat/vessel. DFSBES needs to be a Compact, Portable, Ruggedized, Watertight, Vibration Resistance, IHO acceptable accuracy and resolution along with the external DGPS Receiver, capable to integrate Motion Reference Unit (MRU), Sound Velocity Profiler (SVP) which all could configure standard software through laptop in field, to conduct/carryout bathymetry survey in Ocean/Sea, Lake, River, Stream, Lagoon, Backwaters, Inland Waterways and any water body.
Technical specification	
Echo Sounder – Complete Set The Electronic, Portable and Handy DFSBES should operate in both Low Frequency (≤35 kHz) and High Frequency (≥250 kHz) transducer (transmitter and receiver) in one unit enabling penetration through soft sediments to detect hard bottom for the classification as well as detection of the ocean/seabed bottom surface layers. This equipment should be mount on single pole and can configured through tablet and/or smart phone and/or Laptop.	
Type	**Compact, Portable and Handy DFSBES should have Ruggedness, IP 67/68, shock and vibration resistance along with the IHO acceptable accuracy & resolution.**
Set up	All the equipment should be mounted on a single pole.
Frequency 1. Low Frequency (LF) 2. High Frequency (HF)	1. LF channel ≤ 35kHz 2. HF channel ≥ 250kHz
Ping rate	≤ 10 Hz
Depth range	0.5 to 100m @ 250kHz 1.0 to 100 m @ 35kHz
Accuracy	0.2% of depth @ 250kHz 0.2% of depth @ 35kHz
Beam width	≤ 9° / -3dB points or better (HF) ≤ 26° / -3dB points or better (LF)
Input Power supply	Internal battery supply for minimum 5 to 8 hours working and works with external DC (12 VDC) power sources.
Data Storage	Internal data storage of minimum1.0 GB
Cable length	≥ 10 meter
Protection	Ruggedness, IP67/68, dust and water proof along with shock and vibration resistance.
Temperature range	0°C to 50°C
Connectivity	**Input & Output:** Wi-Fi and Ethernet
Compatibility	Heave Sensor/MRU, SVP, DGPS through Hypack Software
DGPS	Integrated with internal DGPS which can be a separate part/item.
Spares	1. Standard tool kit must be provided.

	2. Essential spares and consumables for operation to be included in the offer. Comprehensive spares list to be quoted as an option.
Output Formats	NMEA 0183
Charts	Data presentation on graphical colour displays required. Chart Printing Not Required.
Software Interface	Web Browser
Standard	Compliance to latest/recent IHO standards
Mounting accessories	1. Two storage case for Echo Sounder, transducer and cable. 2. Water proof glands for transducer and Echo Sounder. 3. Steel rod/pipe (minimum 2 meter 2 nos with coupling) to support the transducer housing and accommodate cable/glands. 4. Case for transducer pole should also be provided.
Weight	<20 kg (including transducer and other mounting assembly)
Manuals / literature	All necessary details such as drawings, dimensions, weights and power consumption of the system/subsystems to be provided along with the quote to facilitate assessment related to space and power requirements. Two set of manual copies with complete circuit description, detailed circuit diagrams for each board. The servicing manual to provide a detailed theoretical aspect of system design. Overall system, signal flow charts, fault-finding flow charts, diagnostic flow charts to be provided, wiring details between different units to be provided. Complete documentation to be made available to the IITM.
Software	Works in Windows operating system, data should readable in Hypack software for Data Visualization and Configuration, GUI, Control & Logging, Display and Storing.
Warranty	1 year

Note:

1. The vendor has to do the Demonstration in front of the IIT Madras Committee Members, if required.
2. Annual maintenance cost if any to be mentioned for 5 years.
3. Instrument's Standard Operating Procedure should be provided with the manual.
4. The bidder should have a strong presence in India for at least 10 years in supplying the similar items.
5. The bidder should have supplied similar type of instrument to the central/state governments, institutes/departments like IITM, NIT, IISC, etc in last three (3) years.

NB: Indicate the authorized service center in India only.