

**(11.10) SPECIFICATION OF 3D BIOPRINTER FOR THE DEPARTMENT OF HEMATOLOGY**

<b>Sl. No.</b>	<b>Specification</b>
1.	3D Bioprinting system is required based on Biomaterial Extrusion, capable of printing bio parts and/or tissue structure with strength for end-use applications, and should supports open source/third-party biomaterials.
2.	The printer should be capable of printing hydrogel biopolymers, temperature-sensitive materials, thermoplastics, and other open biomaterials. Bidder should attach case studies/papers of system being used in the above applications.
3.	Extrusion Based bioprinter should be provided with 3 extruder slots and provision to use different types of printheads simultaneously as well as in combinations for multi-material printing.
4.	The Bioprinter should have the capability of attaching different types of print heads like Pneumatic, Temperature controlled, Thermoplastics Print head, Inkjet Print head, Syringe Pump Print head, and Photocuring Print heads. Following print heads to be provided with the system :
	a. Pneumatic print head – 03 quantities
	b. Temperature Controlled print head – 01 quantity
	c. Thermoplastic print head – 01 quantity
5.	Bioprinter should consist of a built-in HEPA filter system with clean airflow and germicidal UV-C of wavelength 275nm to maintain a clean and sterilized chamber.
6.	Pneumatic Control Print head with the following specification to be provided.
	a. Size: 3ml or 10ml
	b. Temperature Range: 30°C-60°C or higher
	c. Temperature Precision Control: 0.5°C or better
7.	Pneumatic extrusion should cause minimal shear stress on cells while enabling unlimited design freedom and the manufacturer should be able to demonstrate more than 85% cell viability for at least 2 cell lines in standard bio-inks supplied by the vendor. The bidder should attach documentary evidence.
8.	UV Light Based photo curing to be provided. The machine should have inbuilt photo curing modules of 365, 405, 485 and 520 nm wavelength.
9.	The bio printer should be able to print a wide range of bio-inks. It should also be able to print novel synthesized polymers and new polymer blends and composites developed in-house. Bidder should be able to supply these bio-inks in the future if required. Kindly attach product documents with the tender.
10.	Built volume should be X= 120-150 mm, Y = 90-100 mm, Z = 80-100 mm
11.	Should allow the use of multi-well plates (6-well to 384-well format), Petri dishes and glass slides. User should be able to select a choice of build surface while preparing the print through the machine display itself.

12.	Layer Resolution: 1 micron or better and XY Resolution: 1 micron or better
13.	Built platform should be Temperature controlled with a temperature Range: 4°C-60°C or higher
14.	Calibration should be Automatic and Manual.
15.	System should have an inbuilt compressor to provide a pressure range of up to 200 KPa and system can withstand a pressure range between 5 to 700 KPa
16.	Printer should have equipped facility for using a wide range of hydrogels & Bioinks with a Viscosity range from 0.001 to 400 Pa.S.
17.	Systems should be supplied with advanced 3D Bioprinting software for designing and controlling the 3D Bioprinting.
18.	Must support file types with extensions -.STL.
19.	Software should create print reports with all data related to printing such as temperature and pressure control of each print head, protocols used, etc.
20.	Software should be compatible and have a provision for future upgrade to the latest Version.
21.	Should have a 5–10-inch touchscreen display for easy reading & display of temperature & pressure parameters.
22.	Should be made from wear-resistant high-grade material
23.	Bio inks should be provided for initial optimization and printing. The bioinks should be suitable for printing different cells such as bone cells, skin cells, and liver cells etc.
24.	Petri dishes, cartridges, cell mixing device, various biomaterials, and thickeners must be provided with systems for initial optimization and printing.
25.	At least 10-15 installations of the quoted model to be available in India.
26.	Provided with a USB port for connecting to the external memory device.
27.	Warranty: 5 Years
28.	Branded compatible desktop to be provided.
29.	On-site demonstration to be provided if required.
30.	Should be USFDA/ European CE certified with four digit notified body number certified

-----