

CENTRE OF BIOMEDICAL MAGNETIC RESONANCE (CBMR)

LUCKNOW, INDIA

Tender Document
for
Supply, Installation and Commissioning
of

A New State-of-the-Art, Top-of-the-Line,
LATEST 3-Tesla MRI/MRS/fMRI Scanner System
with latest generation of gradient and other systems
on
Turn-key basis

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Tender Document for a State-of-the-Art and Latest 3T Clinical MRI/MRS/fMRI Scanner System

Competitive bids (Technical Bid and Price Bid separately) in two identical hard copies and one soft copy of each bid are invited for the installation of a state-of-the-art, top-of-the-line whole body stable 3 Tesla super conducting magnet MRI system with high homogeneity and latest high performance gradients having digital radio frequency system with optimized matching multi channel coils. Must be capable of large volume and high resolution imaging in conventional, ultra fast mode including echo planer imaging (EPI) with state-of-the-art features, fully functional and having facility for multi nuclear imaging and spectroscopy and functional MRI.

Broad specifications of the proposed system are given below. Specifications quoted are essential requirement of this equipment while terms & conditions are mentioned separately. Cost of the items/features, wherever asked, should be quoted in the price bid only. System must be DICOM-3 standard compliant. The system should be cost effective, reliable and provide excellent performance with technical features for clinical imaging and spectroscopy with advanced biomedical research. All the specifications quoted should be supported by the authentic data sheet. When the standard vendor data sheet disagrees with the bid response, clarification should accompany in the form of letter/certificate from appropriate authority in the absence of which vendor data sheet will prevail for the purpose of evaluation and decision of the technical evaluation committee and shall be final and binding on the supplier.

The detailed specifications that follow shall be understood to be minimum requirement. All points must be addressed clearly quoting data sheet with page number. Please respond to each point in detail and do not mention as 'yes' or 'no' only in the compliance sheet /letter. Any item not covered under the standard package should be quoted separately. Additional technical features suitable to our requirement will be given due preference. Offer should comprise delivery, installation, and acceptable safety measures until hand over of the system including all the accessories.

The vendor must quote the latest state-of-the-art MR System, as specified below. The vendor must fill in the details (like values, make and model, etc,) so as to specify whether they satisfy the tender by filling each row of this compliance statement. The vendor should mark "Yes or No or Not Available" wherever applicable. Signatures of the Marketing, Service and Application Managers / team members of the vendor should be affixed on this document. Enclose all necessary documents in support of the values quoted as necessary.

TABLE: ITEMS AND ITEMS SPECIFICATIONS

#	ITEM	Buyer's Specifications/Comments	Vendor's Specifications
A	MAGNET SYSTEM		
A.1	MAGNET: Operational field strength	3T OR HIGHER , suitable for high resolution imaging & Spectroscopy	
	Dimensions of Bore A. Bore Diameter B. Total bore length C. Bore opening	Should be at least 60cm diameter, well lit and ventilated after positioning of gradient coil, body coil, Shim and RF antenna. Should be flared at both ends. Mention the dimension of flare portion.	
	Magnet weight Mounting	Mention the weight with 100% topped up liquid helium, tank and gradient coils. Minimum Noise from Vibrations, Earthquake Protection?	
A.2	Cryogen Helium tank capacity in liters Helium Refill Interval Helium boil off rate in stand by and operational modes and effect of high gradient on boils off Possibility of Quenching Helium level monitoring equipment in the magnet and facility for appropriate quick shut down of the magnet in the event of emergency. Emergency helium release button should be provided at least in two places [inside MR examination room and console room]	Please specify In days- Should be maximum Please specify Insurance? Should be available	
A.3	Shielding & Fringe Fields: External Shielding:	1) Pl. provide details of shielding against external interference, both for Magnetic Field, and RF. (2) Specify dB level, (3) Shielding against Earthquake Tremors, other mechanical vibrations, to minimize noise during sensitive scans e.g. fMRI. (4) At least two waveguide entries should be provided near the operator's Console, beside the ones in the filter panel.	

	With shielded Magnet , Distance of the 0.5mT line from iso-center:	Please specify: (1) Type of Shielding, (2) 0.5 & 0.1mT field lines with floor map. (3) Does 5G line fall within the confines of the magnet room?	
	a) X – axis meter (inch)		
	b) Y – axis meter (inch)		
	c) Z – axis meter (inch)		
A.4	Field Temporal stability:	(1) Specify in ppm/hr. (Should be <0.1ppm/hr), (2) Does it confirm to fBIRN standards?	
B	SHIM SYSTEM		
B.1	Shimming & Field Homogeneity. Should be high performance and high stability with global and localized manual and auto-shimming for high homogeneity magnetic field required for imaging (MRI / fMRI), spectroscopy (MRS), and magnetic resonance spectroscopic imaging (MRSI). 3D shimming for volume imaging and CSI.	(1) Specify active shimming and passive shimming. (2) Should have provision for automatic in vivo dynamic shimming to improve homogeneity of magnetic field and stability. (3) Pl. specify extent of automation, time required and procedure if manual, for first AND higher orders of shimming, with patient in positino. (4) Feasibility and effectiveness of Off-center FOV shimming	
B.2	Homogeneity Specification of system before and after shimming (shim turned off and on) using volume RMS multipoint plot. Details on number of plane plots used for measurement as well as number of measurement point per plane should be clearly specified. The space should be minimum (small ppm the better). Homogeneity should be measured in at least 20 planes and 20 point in each plane inside a spherical volume in ppm .	45/50cm DSV 40cm DSV 30cm DSV 20cm DSV 10cm DSV Eg: 40cm DSV = 0.5ppm	
B.3	Maximum FOV with uniform fat sat:	Please specify for both Zoom and Whole mode, if different.	
B.4	Type of shim (a) Active, Passive (Iron etc) or combined? Number of independent active shim channels Number of installed shim coils used for active shimming	Please specify for the following:	

<p>Offer the RF with latest Technology (such as optical RF/ Total imaging matrix/multi transmit)</p> <p>RF synthesizer resolution in Hz [.01 – 0.6Hz/step]</p> <p>Is RF spoiling possible?</p> <p>Range receiver band width Receiver Minimum 1 MHz (not sampling bandwidth)</p> <p>Bandwidth of each additional receiver channel</p> <p>Do all channels have the same band width?</p> <p>Phase resolution – 0.1 degree / step or better</p> <p>System should have necessary hardware to support quadrature phased array and flexi coils.</p> <p>Broad Band RF receiver with at least 32 channel system in transmitter as well as receiver side. Receiver Bandwidth for superior RF performance (≥ 1 MHz). Receiver to support 12 or more elements of parallel acquisition coils, compatible with parallel imaging techniques with Scan time reduction factors of at least up to 4 or more in 2D & 3D sequences.</p> <p>No. of receiver channel for phase array coils system</p> <p>No. of channel in brain (head coil), abdomen , spine, cardiac imaging coil and in other coils</p> <p>Receiver signal resolution 32 bit</p> <p>Receiver signal dynamic up to 16 bit</p> <p>Extended radio frequency (RF system).</p> <p>An extended RF system with a higher number of simultaneously usable receiving channels</p> <p>Maximum number of simultaneously receiving element. Single, dual or multiple.</p> <p>Is tuning of RF coil necessary (auto tuning)?</p> <p>System to perform (i) ^{23}Na, (ii) ^{13}C, imaging and/or spectroscopy for brain, heart and body.</p> <p>Double resonant RF channel for spectroscopy and imaging provided or not, to enable proton decoupled studies</p> <p>System should include RF room shielding and include RF door screen to minimize radio frequency (RF) interference to a minimum level.</p> <p>Please offer the highest RF power available for the system quoted, AND specify it's duty cycle</p>	<p>Please specify maximum No. coils simultaneously connected</p> <p>OPTIONAL, PLEASE QUOTE SEPERATELY</p>	
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E	RADIOFREQUENCY COILS:		
	<p>RF coils in addition to main body coil (Transmit / Receive or receive coils) auto tune, array or no tune coils. Coil / RF design should support compatibility to coils manufactured by other manufacturers. All array coils should be compatible with parallel imaging technique/s. (In all cases specify whether transmit/receive, receive only, and the number of elements and channels)</p> <p>Coil tuning, impedance matching, RF power parameter and preamp gain adjustment must be fully computer automated and optimized for each patient.</p> <p>Is it possible for phased array coils to receive signal from multiple surface coils simultaneously without switching or splitting hardware/software?</p> <p>Possibility of simultaneous use of a surface coil and quad coil?</p> <p>Multi channel array coils for High Speed parallel acquisition Technique – mention the coils and other elements</p> <p>Remote coil selection – in conjunction with above, confirm if facility to select the coil elements from the main consol should be there</p> <p>Hardware required for imaging two general purpose flexible coils (flexi coil interface)</p>	<p>Please specify the number of channels and elements available for each coil.</p> <p>Please mention the true acceleration factor for each of the array coils.</p> <p>Please specify number of fast receivers (specify Bandwidth), available for total # of channels possible for the coils.</p>	
E.2	<p>Following coils must be provided:</p>	<p>Description of offered coils should be given under following head:</p> <ol style="list-style-type: none"> a. Type of coil - Number of channels and name of coil , b. Application, c. Number of coil elements, d. Flexible or rigid 	
E.2.1	<p>Integrated body array coil / resonator – circular polarized / quadrature</p> <p>Integrated body array coil with highest number of channel</p>		
E.2.2	<p>Head array Coil. (at least 32 channels)</p>	<p>Specify the largest number of channels with the system quoted</p>	
	<p>At least 12-16 channel Neurovascular imaging coil. Should be a standard coil or the combination of coil elements preferably quadrature to cover entire neck from the aortic arch up to and including the circle of Willis</p> <p>At least 12-16 channel C-T-L Spine Coil to be quoted as standard. Coil for C,T and L Spine – should be phase array/quadrature (CP)</p>	<p>OPTIONAL</p> <p>Higher will be preferred</p>	

	<p>Necessary image processor (>4GB RAM) with sufficiently large memory for ultra fast image reconstruction capable of performing real time image reconstruction in 50ms or less for the above application mode and dedicated hardware for data conditioning and digital filtering.</p> <p>Word length – must be 64 bit – 128 bit</p> <p>Main Memory (RAM) Expandable, Image RAM capacity, 4 GB or more</p> <p>Hard disc capacity for 256 X 256 matrix size images 100000 or more.</p> <p>DATA Archival: Two DVD Read/write drive for writing of images, spectra and raw data along with the necessary software for reading the images and spectra on CD – ROM.</p> <p>Provision for attaching USB devices including FLASH drives.</p> <p>Provision for archival of k-space data and raw (unprocessed) images.</p> <p>DICOM-3 interface to hook DICOM laser camera (dry view) capable of storing, printing 1024 X 1024 matrix images in various formats (1-20) without loss of digital resolution to be made available.</p> <p>One special port [serial / parallel] with necessary interface for inter – linking the machine with a PC of Windows XP/Vista loaded Operating System and TCP/IP communication protocol for transfer of data [image, spectra (raw & processed) and text] over Internet.</p> <p>Image display capabilities of 1024 X 1024 matrix</p> <p>Necessary image format including header and footer information stored imaging and spectroscopy data are to be provided with necessary hardware and software to access the raw data.</p> <p>Access to advanced source code for generating new sequences is to be provided with necessary and adequate literature and hardware support including cross compiler or any other relevant software for pulse programming.</p> <p>A list of sequences (imaging and spectroscopy) which can be opened, read and modified by trained persons working on sequence programming (Research collaboration)</p> <p>Upgradeability of the Host CPU – company must upgrade the host CPU hardware for a period of five year as and when it is upgraded by the firm without any extra cost.</p> <p>Acquisition of next sequence must be possible while the image for last sequence are being reconstructed</p>	<p>Give configuration</p> <p>1 Terabyte or more</p> <p>For research purpose</p>	
G	DATA ACQUISITION		

All Coils should be capable of running all sequences including Diffusion imaging and Proton spectroscopy

System should be capable of 2D & 3D acquisitions in conventional, fast, ultra fast spin echo and gradient echo modes so that real time online images can be observed.

2D multi slice imaging should be possible in all planes (axial – sagittal – coronal. Oblique & double oblique)

Matrix – 128 X 128, 256 X 256, 512 X 512, 1024 X 1024 and rectangular matrix selectable in steps of 1.

Half Fourier or other technique to reduce scan acquisition time while maintaining adequate SNR.

3D volume, multiple continuous slabs, multiple inter leaved and multiple overlapping slabs.

Slice thickness in 2D & partition in 3D to be freely selectable.

Dynamic acquisition (Serial imaging with capability to initiate scan sequence) either from the magnet panel or from the console.

Dynamic acquisition: number of repeat scans with delay time either identical time interval or selectable.

Auto slice positioning from the localizer imaging

Maximum off center positioning anterior – posterior and lateral direction should be selectable.

Gating physiological signal like ECG, pulse, respiratory, external signal triggering (interface for triggering input pulse from external source)

Simultaneous acquisition, processing and display of image data in multi slice mode.

Selection of VOI's from oblique slices should be possible while doing spectroscopy.

Artifact reduction / imaging enhancement / imaging filtering / image subtraction / addition / multiplication / division techniques

Flow 1st and 2nd order flow artifact compensation.

Presentation slabs – a number of re-locatable saturation bands be able to be placed either inside or outside the region of interest.

Fat saturation techniques, frequency selective RF pulses to suppress fat signals in the measured image FOV. ROI selective (regional) fat suppression should be given.

Magnetization transfer saturation: Off resonance RF pulses to suppress signals from stationary tissue in FOV phase contrast capability in 2D & 3D mode.

Method for efficient SAR management

Specify pulse sequences and techniques where 1024 x 1024 matrix can be employed.

Please provide details of hardware and software methods

	<p>Phase Contrast capability in 2D and 3D mode</p> <p>Image intensity correction</p> <p>Breath hold acquisition</p> <p>Free breathing acquisition (2D, 3D) for thoracic and abdominal imaging</p> <p>G.1 EPI mode</p> <p>Data acquisition in all three standard planes (axial, sagittal, coronal) and oblique and double oblique planes.</p> <p>Higher matrix acquisition capabilities in single shot EPI acquisition time. TR, TE and slice thickness should be clearly mentioned and supported by data sheet references.</p> <p>G.2 Parallel Acquisition</p> <p>System should have parallel acquisition capabilities complying the following requirements</p> <p>a. Compatible for all 2D as well as 3D sequences</p> <p>b. Should be combinable with all orientations (Transverse, sagittal, coronal, oblique and double oblique)</p> <p>c. Should support up to factor 4 or higher for reduction in scan time for all applications as compared to normal acquisition.</p> <p>d. Should be combinable with all imaging applications (Neuro, Cardiac, Body, musculoskeletal, angio including CE angio.)</p>	<p>What is the largest FOV that these PC images show acceptable distortions?</p>	
H	IAMGING SPECIFICATIONS	Please specify	
	<p>a. Minimum TE in Gradient Echo</p> <p> b. 2D</p> <p> c. 3D</p> <p>a. Minimum TR in Gradient Echo</p> <p> b. 2D</p> <p> c. 3D</p> <p>Minimum slice thickness 2D for all sequences.</p> <p>Minimum slice thickness 3D for all sequences.</p> <p>Minimum FOV for all sequences (2D & 3D) :</p> <p>Maximum FOV for all sequences (2D and 3D)</p>		

	<p>Prospective motion detection and correction 1D – 2D</p> <p>Is an acquisition technique with prospective motion correction available</p> <p>Prospective motion detection correction 3D motion correction available?</p> <p>Is it possible to perform scans with arbitrarily sorted K – space filling (elliptical sequential, arbitrary assignment etc)</p> <p>Is it possible to perform scan with segmented K – space?</p> <p>Is it possible to perform all fat and water saturation techniques including in phase out phase imaging with a single sequence?</p> <p>Use of magnetization transfer contrast technique (MTC) for all sequences possible? Please list the sequences where it is not possible.</p> <p>Maximum ETL, 128 or better in full Fourier transformation</p> <p>3D sequences, Please list the 3D sequences type with submillimeter isotropic resolution</p> <p>ECG Trigger including one set of patient lead wires, Two fiber optic peripheral gating probe – one adult and one pediatric</p> <p>Physiological synchronization</p> <p>Displaying and triggering of ECG, pulse, respiration and external triggering sources on main console.</p> <p>To perform a scan with an external trigger source eg. Pulse generator for functional imaging.</p> <p>Display the ECG on magnet</p> <p>Advanced trigger detection</p> <p>Arrhythmia minimization</p> <p>Peripheral trigger</p> <p>Pulse / Respiratory trigger</p>	<p>If yes, does it include a correction in all 3 linear direction and specially all three rotational directions?</p> <p>Is it suited for functional MRI with increased sensitivity and specificity?</p> <p>(reduced scan time by a factor of two for different applications)</p> <p>Please give the details. Please specify if Phase Images can be obtained with all sequences, at least in the Research Mode.</p>	
I	PULSE SEQUENCES		
I.1	<p>Basic Pulse Sequences</p> <p>Spine Echo (SE) – Multi slice single echo, multi slice multi echo (8 echo or more) with minimum TR & TE. SE with symmetrical and asymmetrical echo intervals.</p>		

	<p>Inversion Recovery (IR) including short TI – modified IRSE, FLAIR, DIR (Double Inversion Recovery)</p> <p>MT with SE and FLAIR STIR (Short Tau Inversion Recovery)</p> <p>Gradient Echo – Gradient Echo with transverse gradient / RF spoiling and transverse gradient re-phasing eg. GRASS or equivalent. 3D gradient echo with shortest TR & TE, free choice of flip angle selection while maintaining SNR.</p> <p>Dynamic study for Pre & post contrast scans time intensity studies (Wash in and wash out) and Kinematics</p>		
<p>I.2</p>	<p>Fast Sequences</p> <p>FSE – Fast spine echo in 2D & 3D mode. T1, T2 and PD contrast capable of acquiring maximum of slices with a given TR and minimum TE, Echo train should be at least 256 or more in fast spine echo mode.</p> <p>Ultra short fast spin echo</p> <p>Half Fourier acquisition capabilities should be available with/without diffusion gradient and in combination with fast spine echo.</p> <p>Fast spine echo with inversion recovery</p> <p>Fast gradient spine echo IR multi slice, multi echo mode with minimum turbo factor. Sequences should incorporate RF focusing to acquire ultra fast gradient spin echo.</p> <p>Fast gradient echo sequences should incorporate RF spoiling & other techniques to acquire image in ultra fast 2D & 3D modes</p> <p>Fat & water suppressed imaging sequences.</p>		
<p>I.3</p>	<p>Ultra-Fast sequences</p> <p>a. EPI (Echo Planar Imaging) Single shot and multi shot optimized sequences for T1, T2 and PD imaging. Perfusion, regular diffusion values (3 directions) EPI – FLAIR, EPI –IR, EPI- FLAIR diffusion Tensor, EPI - MT – FLAIR. Tensor diffusion for diffusion studies, suitable artifact / fat suppression techniques to be incorporated in the sequence to have optimum image quality. There should be capability of calculating ADC map (Isotropic and anisotropy from regular diffusion and tensor data.) It should be possible to perform arterial spin labeling (ASL) of the brain, and the corresponding software to give various perfusion maps with quantification possibility.</p> <p>b. If any of the items are not available as clinical tool at present and available as research tool may be provided under research agreement</p> <p>c. Is it possible to prescribe oblique planes in DTI? If so pl provide the processing software for the same.</p>	<p>Specify the number ofshots for EPI in 64x64, 128x128 and 256x256 matrices.</p> <p>Please specify whether it is possible to perform DTI of the liver in vivo?</p> <p>Please specify</p>	

<p>Single shot selectable with all coils including phased array coils for very fast imaging of trauma patients.</p> <p>Projection Reconstructed Sequences available?</p>	<p>Please describe full details with specifications on temporal resolution</p>	
<p>I.4 Optimized sequence package for special applications:</p> <ul style="list-style-type: none"> a. MR angio – Comprehensive angio software package with and without use of contrast for the whole body. b. 2D TOF, 3D TOF, TOF overlapping sequence c. 2D / 3D phase contrast with and without gating and magnetization transfer saturation d. Black Blood angiography for cerebral, pulmonary abdominal and peripheral vessels. e. For peripheral angio moving table angiography must be provided so that complete limb can be examined in single go. f. Bolus tracking software package must be provided. g. Sequences for breath hold angiography with contrast enhancement should be offered l. Time resolved MRA with high temporal resolution and high spatial resolution. <p>Advanced MR cardiac examination package for evaluation of heart in long and short axis with white as well as black blood cardiac imaging. Morphology, wall motion, perfusion imaging, cardiac tagging technique, real time interactive imaging free breathing cardiac MR examination. Myocardial viability, myocardial perfusion.</p> <p>MRI including ability to adjust the cardiac phases required with increasing HR:</p> <ul style="list-style-type: none"> (i) Myocardial tagging sequence, (ii) 2D and 3D Sequences enabled with delayed enhancement. (iii) 3D sequence of cine (bright blood & dark blood options). (iv) STIR sequence for cardiac use (iv) 3D whole heart sequence (with & without contrast for coronary imaging). (v) Ability to acquire multiple arterial and venous phases on CE MRA (vi) Quantitative flow analysis software. (vii) 3D acquisition of whole heart in one breath-hold. (viii) Maximum FOV in 4D TRAK. (ix) Stop watch (MR compatible) for timing drug infusion <p>Package for coronary artery imaging including sequences for motion compensation, prospective and retrospective gating should be available. Contrast enhanced and without contrast enhanced sequences.</p>		

	Software package for full automated analysis should be available. Velocity quantification, quantification of aortic and pulmonary flow should be available.		
I.5	<p>Sequences for Advance Applications</p> <p>a. Sequence package for diffusion study in organ like brain, Kidney, muscle, heart, liver etc. Perfusion study in organ system like Kidney, Brain, Muscle, Heart etc evaluation package for calculating CBV, CBF, MTT, Perfusion MAP etc. (Should be possible on main console in real time)</p> <p>b. Flow quantification in vessel & CSF, hepatobiliary system</p> <p>c. Optimized breath hold sequences for abdominal studies including angiograms. State sequences offered with acquisition time.</p>		
I.6	<p>Sequences for Other Imaging Protocols:</p> <p>Internal Ear Imaging – Details of sequences available</p> <p>MR cholangiography, MR pancreatogram; MR urography, specialized sequences and processing to perform MRCP. Give details of sequences available.</p> <p>Flow quantification package for CSF with dynamic CSF flow imaging at aqua duct and spinal canal.</p> <p>Dynamic MR Elastography-If not available as clinical, may be supplied under research agreement</p> <p>Pulmonary 2D/3D MRA sequences</p> <p>Navigator technique for collection of functional imaging data</p> <p>Suitable artefact/fat suppression techniques to be incorporated in all the sequences to have optimum image quality.e.g. reducing CSF flow artifacts in FLAIR 2D/3D imaging.</p> <p>Radial/Spiral pulse sequences for ultrafast imaging.</p> <p>A sequence for differentiation of fluid and cartilage in ortho applications (sequence like DESS or equivalent)</p> <p>Susceptibility artefact correction techniques to be incorporated in all the sequences to have optimum image quality.</p> <p>Sequences for susceptibility imaging</p> <p>Sequences for prostate, breast, etc.</p> <p>Sequence for in-line motion correction for uncooperative patients/ children (with software and acquisition - sequences like BLADE, PROPELLAR, k-t BLAST or equivalent)</p>	<p>OPTIONAL, Quote Separately</p> <p>OPTIONAL, Quote Separately</p>	

	<p>Software and hardware along with License to develop and modify pulse sequences, and license(s) and provisions to execute the same on the MR scanner.</p> <p>Sequence with ultra short TE</p> <p>Sequence for nullifying CSF pulsation artefacts</p> <p>Sequence enabling prospective motion correction in quick time and in real time during fMRI</p> <p>Sequence employing arterial spin labelling (ASL) technique</p> <p>Whole body imaging (using both body coil and surface coils)</p> <p>Whole body diffusion weighted imaging (using both body coil and surface coils)</p> <p>Automated fusion and composing for the above two (without any artefacts)</p> <p>Volume acquisitions for neuro applications</p> <p>The vendor must provide their specialized and optimized imaging sequences with post-processing packages for (i) neuro, (ii) body, (iii) breast, (iv) oncology, (v) cardiac, (vi) angio, (vii) ortho, (viii) pediatric and other applications. For example, this includes packages like optional/premium/ advanced/ application suite/ etc.</p>		
I.7	<p>Sequences for Functional MRI (fMRI):</p> <p>Sequence package for functional mapping of brain with paradigms for motor tasks, perceptual tasks, attention tasks, memory tasks, and cognitive tasks with digital sound editor, graphics editor, generalized task editor etc. Utilities and suitable software for its evaluation.</p> <p>a. Integrated complete hardware and software tools for presentation, data collection and analysis solution for FMRI assessment</p> <p>b. Dual computer with software for experimental control, patient management and functional analysis Pentium 4 computer (high end) with CD/DVD drive for experiment presentation loaded with E-prime SW80 GB Hard Disk with at least 2MB video RAM Brain Voyager package or equivalent functionality Master control interface between computer and peripheral devices Large LCD patient display with Head Coil mount in magnet room, patient head phones, patient microphone and 5*2 keypad response unit LCD display should have unrestricted FOV (non-goggle based system must be quoted) LCD display fixed on top of Head Coil RF detector and console enabled TTL triggered for pulse synchronization Fibre Optic cable between Magnet and console. Paradigm generator should have pre-set of paradigms for experiment generation and user programmable paradigm generation should be possible as well CD/DVD for patient entertainment 3.0T compatible and FDA cleared.</p>	<p>OPTIONAL ITEM, please quote separately. Please give details of post processing software.</p>	
J	FUNCTIONAL MRI PACKAGE		

J.1	<p>Complete fMRI solution including audio-visual projection (3D capable) system fitted on the 32-channel head coil, along with stimulus presentation licensed software (like Superlab, eprime, Presentation), with post-processing workstation / server with post-processing software and hardware associated, with licenses for Brain voyager and licensed operating platform required (like MATLAB, IDL, etc); The package should be from Resonance Technology Inc. (mrvideo.com) or Eloquence or Nordic neurolab or equivalent.</p>	<p>OPTIONAL ITEM, please quote separately.</p>
J.2	<p>MR Compatible Audio Visual stimulation along with eye-tracker, with triggering/ synchronisation with MRI scanner consisting of visual stimulation, eye-tracking and auditory system (for human MR systems). The system should be a single unit and should comply following specifications individually. The vendor should offer all the three units necessarily manufactured from the same source, comprehensively as a package deal in total.</p>	<p>OPTIONAL ITEM, please quote separately.</p>
J.3	<p>Visual stimulation unit for fMRI:</p> <ol style="list-style-type: none"> 1. Digital dual-display video (minimum 800x600 resolution) with atleast 20o horizontal and vertical field of view 2. Should have built-in or attachable diopter correction for vision using cylindrical/spherical lens attachment (independent for both the eyes). 3. Should be compatible with 32-channel 3T head coils. 4. Should be able to deliver fMRI visual paradigms without flickering/disturbance. 5. Should not have dark spots (due to fibre-optic cable breakage or other problems) 6. Dual 3D capable video display 7. Biocular and binocular modes 8. Rated for 1.5 to 3.0 T magnetic field strength 9. Should include a display unit at the console, all fibreoptic cables for transferring the audio-video signals to the dual display unit in MRI. 10. Trigger-pulse for event related experiments 11. Delay in response of visual stimuli should be less than 8ms. 	<p>OPTIONAL ITEM, please quote separately.</p>
J.4	<p>Eye-Tracking Unit for fMRI</p> <p>Software for real-time monitoring of pupil-movements;</p> <ol style="list-style-type: none"> 1. Should track patient/ subject's eye movement during paradigm delivery 2. Software should be time-stamped 3. Spatial resolution of tracker should be Approximately 0.15° visual arc 	<p>OPTIONAL ITEM, please quote separately.</p>

	<p>4. Spatial accuracy of tracker should be 1 degrees, drift < 0.3 degrees</p> <p>5. Temporal resolution of tracker should be 30 Hz to 120 Hz</p> <p>6. Database of eye and visual stimulus needs to be synchronized and portable to other formats such as Matlab, excel etc.</p> <p>7. Easy and fast calibration of eye movement parameters</p> <p>J.5 Audio stimulation unit for fMRI:</p> <p>1. Digital audio system with CD/DVD drive and PC/Laptop interface</p> <p>2. Noise attenuation should be min. 30 dB</p> <p>3. Headset with noise-attenuation of Passive noise; Preferable with active noise cancellation</p> <p>4. MR compatible transducers and speakers compatible with 3.0T magnets</p> <p>5. Should have two-way communication, unaffected during MRI scans (even during EPI acquisitions). Auditory frequency (40Hz to 35kHz) should be covered without any background noise (SNR of audio signal 80dB min)</p> <p>8. Please quote for digital eye-tracker (with analog version as an option).</p>	<p>OPTIONAL ITEM, please quote separately.</p>	
K	MULTI-NUCLEAR IN-VIVO SPECTROSCOPY		
	<p>a. System should have capability to perform proton spectroscopy and multiplanar, multinuclear spectroscopy (31P, 13C, etc), along with optimised sequences and software for post processing and evaluation, including single-voxel/multi-voxel/global spectroscopic estimation quantitatively.State minimum TE & TR for spectroscopy sequences.</p> <p>b. Proton, Carbon-13 with all hardware and software</p> <p>Sequence and protocol for multi nuclear spectroscopy (3D, CSI) Sequences for sodium imaging for head and knee</p> <p>Water suppression</p> <p>Capability for single voxel and multi voxel spectroscopy acquisition for all the nuclei</p> <p>STEAM, CSI, PRESS, STEAM with CSI, PRESS with CSI with different TR/TE</p> <p>Multi slice MRSI with outer volume fat and water suppression using SE and EPI techniques</p> <p>Post processing should include FFT, base line correction automatic phase correction, curve fitting, metabolite image and spectral mapping, quantization of metabolites etc</p>	<p>Please quote any OPTIONAL ITEMS in the Spectroscopy Package separately.</p>	

	Minimum VOXEL size for 1H (head coil) in a single voxel mode will be preferred Simultaneous display and evaluation of image and spectroscopy data		
L	POST PROCESSING AND EVALUATION SOFTWARE		
	<p>3D multi planar reconstruction (MPR) in any arbitrary plane including curved planes with freely selectable slice thickness and slice increments in matrix 256 X 256 X 128.</p> <p>3D surface reconstruction and evaluation of a reconstructed image with minimum time.</p> <p>MIP in 2D & 3D mode. Targeted/segmental MIP in any orthogonal axis with minimum processing time and capable displaying in cine mode.</p> <p>Cardiac evaluation operator selective or automatic contour mapping and calculation of cardiac parameters like wall thickness, stroke volume EF, filling rate, myocardial wall motion etc including display of data in table, graph and in cine mode, blood flow quantification, velocity mapping, pressure gradient quantification, shunt quantification, regurgitation, stenosis, blood flow calculation, etc.</p> <ol style="list-style-type: none"> 1. For quantification of tagged images (e.g., HARP analysis) 2. Semi- and fully quantitative analysis of myocardial perfusion. 3. Quantification of myocardial scar vs total myocardium volume / mass on DE imaging. 4. Analysis of both RC and LV volumes mass and ejection fraction to be available separately; should be possible to do manually and in fully automated manner. <p>Evaluation and display of diffusion images, ADC map, fMRI in reference of EPI optimized sequence.</p> <p>Voxel-based morphometry for segmentation and quantification.</p> <p>Perfusion image evaluation with time intensity graph and other statistical parameters.</p> <p>Evaluation package for calculating rCBV, rCBF, MTT, perfusion map, etc.</p> <p>Flow quantification and evaluation for vascular (high & low) CSF, bladder outlet and cine display.</p> <p>Evaluation of functional images of brain with appropriate statistical algorithms, colour display and overlay on base anatomical images.</p> <p>Image statistics – measurement of distance, area, volume angle, SD, mean, image addition, subtraction, multiplication, division, interpolation, segmentation, threshold, histogram (ROC)</p> <p>Fusion software for angio (MRI, MRA and/or DSA) fMRI, DTI, tractography etc</p>	These should be usable on main as well as on additional workstation.	

	<p>Evaluation feature like, Zoom, rotation, scroll, roaming, image synthesis, multipoint T1, T2 calculation (more than 3) Window stretching, text dialogues, graphics, storing, searching, archiving, recalling.</p> <p>T1 relaxometric measurement</p> <p>T1 perfusion imaging –Ktrans,ve, plasma fraction calculation</p>		
M	OPERATOR'S CONSOLE AND WORKSTATION		
	<p>Provide detailed specification including resolution, workstation based and operating platform</p> <p>a. Online display</p> <p>b. The possibility of automatically displaying images immediately after reconstruction should be available</p> <p>c. Simultaneous use of the main console for other task</p> <p>d. Can next scan be started before the reconstruction of the previous scan has been ended (parallel scan and reconstruction)</p> <p>e. How many data sets can be reconstructed simultaneously (Actual scan not yet finished plus number of previous scans still being reconstructed)</p> <p>f. Monitor size at least 18" TFT flat/colour monitor magnetically shielded. Display matrix – 1024 X 1024 (1K) or more</p> <p>Does operator's console contains the following:</p> <p>Emergency scan abort capability</p> <p>Manual Over ride</p> <p>Audio system for communication</p> <p>Integrated respiratory, pulse and cardiac wave form display</p> <p>Provision of necessary hardware and software for pulse programming and pulse generation. Access to sequence generator must be provided</p>	<p>Specify resolution</p> <p>As a part of research agreement</p> <p>Specify the following for work station</p> <p>Type of CPU</p>	

	<p>Additional Workstation: One workstation with colour TFT display (18" or more) with evaluation capabilities like MIP, MPR, surface reconstruction, spectral analysis, perfusion and diffusion studies, tensor mapping, tractography, 4D VF, spectroscopy postprocessing (SVS, CSI, metabolic imaging), etc. Separate licenses for all the post-processing should be provided. Specify clearly the algorithms that require extra license and list them whether these have been included or not. Filming also should be possible from this work station.</p> <p>a. The image format must conform to ACR-NEMA format standard</p> <p>b. Provide details of image format and header information for imaging and spectroscopy data</p> <p>c. The main console and work station should operate on the same platform preferably with the immediate image transfer (Automatic Data transfer capabilities).</p> <p>d. Image documentation should be possible from the main console as well as the workstations</p> <p>e. Additional post-processing software on the workstations display facility must be provided.</p> <p>Connection with PACS must be provided with all supporting software.</p> <p>SOFTWARE PACKAGES on WORKSTATION</p> <p>Compatible with data from high resolution MRI Units</p> <p>Required Interface for existing equipment (CT, MRI, Ultrasound, DSA) in the department. Detailed configuration of network is available from the computer division.</p>	<p>OPTIONAL, Quote Separately</p> <p>Specify:</p> <p>(i) Processor Details,</p> <p>(ii) RAM</p> <p>(iii) Total Hard Disk Capacity,</p> <p>Should include 19" or more TFT monitor with enhanced graphics accelerator.</p> <p>All licenses on Main Console should be available on additional workstation also. Specify the licenses individually.</p> <p>Word length</p> <p>Main Memory (RAM)</p> <p>Hard disc storage capacity of 1 TB or higher and DVD writer to be included</p> <p>Type of array processor</p> <p>Raw data memory</p> <p>Word length of array processor Array processor memory (RAM)</p> <p>Colour monitor at least</p> <p>18" LCD / TFT / Flat colour monitor – provide detail specify make & resolution (1024 X 1024 dot resolution or better)</p> <p>All the software packages available on the main console should also be available on both workstation also</p>	
N	PATIENT HANDLING SYSTEM/ PATIENT TABLE		
	Computer controlled patient table movement in vertical and horizontal direction.		

Specify the type of patient table: whether conventional removable trolley type or fixed type	Dock-able will be preferred.
System should be offered with the latest design patient table with maximum available horizontal and vertical speed	
If fixed type what facility is incorporated for shifting the patients on MR table	
Separate patient transport system, non-magnetic stretcher for separate patient transport.	
Lowest table height	
Positional accuracy of the patient table should be specified.	Please specify
Better accuracy and reproducibility in advanced application such as CE MRA is preferred. Peripheral MRA with stepping table movement.	Specify.
Accuracy of repositioning	
Scannable range and accuracy	
Digital display of table position	specify
Table control from console (eg. for peripheral MRA)	Please specify
To start, stop and pause a scan at the magnet control panel	Please specify
Longitudinal table speed	
Patient load	
Integrated patient physiological signal monitoring. (ECG, respiration and pulse). Gating hardware and software for ECG, Pulse, respiration etc provided or not	
LCD Display panel Physiological signals – like ECG / VCG, respiratory signals etc., and table position should be displayed in the console. Display of identification of connected coil, table position and also remote selection of coil element must also be possible	
Does physiological measurement unit travel with the patient table?	
Availability of additional display of physiological data in the examination room.	
One button iso-center positioning	
Home positioning (out) just by push button	
Gating hardware provided or not for external interface	
Immediate table release and manual table move from gantry in case of emergency	
Cushions, mattresses, and other patient comfort accessories	
All parts of the table should be protected from liquid spill	

	<p>Provide detail on Patient immobilization devices. e.g. Security straps and cushions.</p> <p>Fresh air ventilation</p> <p>Intercom system</p> <p>Diffuse interior light with long lasting light source</p> <p>Duplicate controls and indicator</p> <p>All patient essential accessories and comfort aid to be listed.</p> <p>Close circuit TV and CCD video camera for patient monitoring.</p> <p>Hand held patient alarm system</p> <p>Music entertainment for patient (integrated, inclusive of CD disc interface)</p> <p>Patient music head set must be magnet compatible inside the magnet bore.</p>	<p>For adult and pediatric applications, please specify the make and model with adult and pediatric probe, please specify the make and model</p>	
O	NETWORKING		
	<p>A software interface for a PACS connection to other modalities must be included in the offer.</p> <p>DICOM 3.0 compatibility for networking (send & receive facility with other imaging system and spectroscopy)</p> <p>Network of MRI system with Linux/Unix/Window based PC workstation with necessary hardware and software on the basis of Ethernet. TCP/IP protocol to transfer image data from MR system & PC's / Workstation and receive processed images back from PC's / Workstation to main MR system.</p> <p>Following DICOM functionalities must be supported</p> <p>DICOM send / receive</p> <p>DICOM query / retrieve</p> <p>DICOM work list (HIS / RIS)</p> <p>DICOM storage commitment (SC)</p> <p>MPPS (Modality performed procedure steps)</p>		
P	MISCELLANEOUS		

	<p>Phantoms (All type imaging & spectroscopic) including structured phantoms and quality assurance as per AAPM standard for SNR in different coils spatial resolution, magnetic field inhomogeneity, eddy current compensation, RF power & inhomogeneity measurement AAPM recommended distortion measurement phantom. Spectroscopy phantoms for short echo time neuro-metabolites, breast and prostate.</p> <p>Customer run able diagnostic software for quality assurance and fault finding</p> <p>Hand held metal detector (one)</p> <p>MR compatible cardiac and physiological monitor (ECG, NIBP, SPO2,)</p> <p>Provision for external trigger (of the sequence) near the console</p> <p>Provision for serial ports and DB15 ports in the penetration panel for routing SVGA/EEG connections (two each for customer use).</p> <p>Non-magnetic I/V stand, etc.</p> <p>All the necessary interconnecting interfaces cables, modules & other hardware & software totally integrate the system for completion to fully operational status.</p> <p>Any other advanced application package like interactive imaging package for cardiac imaging and spectroscopy evaluation should be offered. Give all technical details and literature.</p> <p>RIS and PACS connectivity must be provided</p> <p>The system should have the following</p> <p>Room oxygen level indicator</p> <p>Gas transfer fitting and accessories</p> <p>Acute voltage regulator with UPS (specify capacity, with backup time 30 minutes)</p> <p>Details of gradient cooling – Amplifier Gradient coils</p>		
	<p>CD/DVD recorder with interface for online / real time connected to the operator's console for work station; AVI movie maker</p> <p>Adult and Pediatric leads for ECG, Pulse gating and respiratory gating</p> <p>System should be offered with imported hard metal RF cage</p>		
Q	OTHER ACCESSORIES		
	<p>Diffuse interior light with long lasting light source</p> <p>Duplicate controls and indicator</p> <p>All patient essential accessories and comfort aid to be listed.</p>		

	<p>Close circuit TV and CCD video camera for patient monitoring.</p> <p>Hand held patient alarm system</p> <p>Music entertainment for patient (integrated, inclusive of CD disc interface)</p> <p>Patient music head set must be magnet compatible inside the magnet bore.</p> <p>UPS for complete system for 30 minutes</p> <p>Coil Storage cart system to house all the coils and accessories such as pads, mattresses, phantoms</p> <p>Clearly state power requirement, heat dissipation in each room, accessories be adapt to local power, water supply, temperature, humidity, dust and other environmental hazards and variations</p> <p>System should have built in remote service diagnostics</p> <p>After sales service support at Lucknow</p>	<p>As per international standard and as approved by FDA. Must match with Indian standard & law</p>	
R	<p>OPTIONAL ACCESSORIES</p>	<p>Please Quote seperately</p>	
	<p>MR compatible EEG system - : 23 electrodes to complete the requirements of a standard international 10–20 system</p> <p>MR compatible syringe/infusion pump, non- magnetic IV stand, non-magnetic oxygen cylinder (2) along with a MR compatible anesthesia machine with a vaporizer and ventilator of standard make.</p> <p>MR compatible pressure injector with 2000 syringes—for perfusion imaging, contrast enhancement MRA and bolus tracking,</p> <p>Anesthesia Equipment Requirement</p> <p>One MRI compatible anesthesia machine with the following facilities eg. Oxygen, air and nitrous oxide flow meters. Isoflurane & sevoflurane vaporizer, adult, pediatric and neonatal ventilator. Latest safety alarms as applicable to MRI room and gas failure alarms.</p> <p>One color laser printer to print on color laser films (SONY/Codonics)</p> <p>Arrangement of Gas lines in recovery room and in magnet room</p> <p>Patient monitoring device with Pulse oxymeter), O2 monitor, NIBP, Et CO2 sampling line, MR compatible Laryngoscope for adults and children etc</p> <p>Multiformat Imager</p> <p>Laser camera – DICOM 3.0, Dry. Specify make/model</p>	<p>Please quote one of these makes : Datex-Ohmeda, Penlon</p> <p>For adult and pediatric applications, please specify the make and model with adult and pediatric probe, please specify the make and model</p>	

	<p>System must provide complete batch filming with means to adjust image contrast and density</p> <p>Image must be controlled for exposure from the operator's consol and any workstation. An interlock/indicator system must be provided to prevent image production from one console from being intermixed with images from other consoles</p> <p>Remote keypad, contrast inversion,</p> <p>Must be able to do serial processing imaging system wise when multiple systems are connected to the processor</p> <p>Specify various formats which can be had on 14" X 17" films with detailed software specifications</p> <p>All needed software and hardware must be provided</p>		
S	TURN-KEY INSTALLATION		
	<p>5-Year Hardware and software upgradation free of cost as per the latest released versions after the installation of the equipment excluding the magnet</p> <p>After the 5-year upgradation of the software for subsequent 5-years</p> <p>Maximum time to supply all the hardware and software agreed upon in the tender quotations and in the subsequent technical and financial negotiations should not exceed 3 months. Beyond this period, a financial penalty clause will be added - 1 lakh/day for the first week of delay and Penalty will double every week after that.</p> <p>The system should be installed and handed over in working condition, with all the necessary electrical, air-conditioning and civil works undertaken by the vendor in consultation with the user department. Some re-arrangement of the existing place including relocation of staff place may have to be carried out. The details of the turn key are in Annexure -I. A tentative architectural plan is attached for reference.</p> <p>All the necessary interconnecting interfaces, cables, modules and other hardware and software to fully integrate the system for full operational status.</p> <p>Uninterrupted power supply (UPS) with sufficient capacity for 30 minute back up of the full load MR system and its accessories (minimum capacity – 140 KVA). Mention capacity, Make, Model</p> <p>Generator with sufficient capacity for operation of MRI (including powerful gradient sequence), accessories, airconditioning, etc (minimum capacity should be 250 KVA). Mention capacity, Make, Model</p> <p>The turn key items, UPS, Generator and other local items have to be quoted in Indian rupees only in the commercial bid.</p> <p>Water chiller should be of imported make. Mention Make & model</p>	Optional	

T	TRAINING -IMPORTANT:		
	<p>Two qualified personnel nominated by the department should be given advanced training by the vendor (at their cost) at a recognized site of the manufacturer defined for this purpose. Only two persons will be trained abroad over the course of the next 5 years, training for updating of any software should also be provided by the vendor. Such training should be for pulse sequence development and image reconstruction, with course certificates, authorizing the user(s) to operate and implement new sequences. All new codes for new pulse programs should be provided by the vendor for research purposes, as well any other facility deemed necessary for effective research and development, for example, membership of the vendor's User's Group, facilitating participation of relevant workshops etc.</p> <p>On site training for 2 technologists for 2 weeks each on the supplied make and model. Vendor should commit to updating such training of the technologists as and when required, for example, with new vendor products, or replacement of the technologist.</p> <p>95% up time of 365 days (24 hrs a day) that is from the day of successful handing over of the equipment.</p>		

IMPORTANT NOTES:

All agreements should be binding on the Principal and should be signed by the Principal and Indian counterpart. The Principals should be responsible for any lacuna or deficit in service or supply.

All items in the supply order should be supplied during the time of installation. No exceptions will be allowed. Items under Research Agreement should be finalized well in advance (after receipt of supply order), so that there is no delay in delivery of software or coil or any other accessories.

Software upgrades (where hardware upgrades are not required) like new pulse sequence, new application package, etc, should be provided within one month after release worldwide (any country, viz. North America / Europe / Germany, etc). In case, the same is not provided in time, the parent company should undertake the responsibility to implement the same. This is to make sure that the machine stays updated with similar products for at least five years.

WARRANTY PERIOD

- (a) The equipment should have 60 months warranty from the date of handing over the fully functional unit of all coils and the accessories supplied, against manufacturing defects of material and workmanship. The Helium Supply and cold head repairs (including replacement, if needed) should be included in the warranty.
- (b) Even during the warranty period, the desired uptime of 95% of 365 days (24 hrs basis) will be ensured. In case the down time exceeds the 5% limit, extension of the warranty period will be twice the excess down time period.
- (c) Loss of Liquid Helium due to quenching or any other cause during the warranty period shall be borne by the firm.

POST GUARANTEE ANNUAL COMPREHENSIVE MAINTENANCE CONTRACT (CMC)

- (a) The post- warranty (after 5 years) CMC should be comprehensive and should include helium and cold head (repair and / or replacement) + labor + spares for the complete system which includes all the accessories supplied with 24 hr. manpower for operation and maintenance for another 5 years. The vendor should provide the cost of manpower separately under optional.
- (b) The desired up-time during post-warranty CMC is 95% of 365 days (24 hrs basis) along with the penalty clause that in case the down time exceeds the 5% limit, extension of the post-warranty CMC period by the twice the excess down time period.
- (c) The insurance should be done by the bidder to cover the losses, if any, due to force majeure conditions. The rate of post warranty comprehensive CMC should be offered for at least five years by the bidder and be offered in Indian rupees only under optional.
- (d) Any Liquid Helium loss due to quenching or due to any other causes during the CMC period shall be borne by the firm.

All local items should be quoted in Indian Rupees. Other items should be quoted in US dollars only, to have uniformity. The technical and financial bids (in duplicate) should be submitted in separate sealed covers..

DETAILS OF TURN-KEY FOR INSTALLATION OF 3-TESLA MR SYSTEM

1. Civil works

1. While modifying the existing rooms for the system, the vendor should relocate the power panel.
2. The two rooms where the UPS and MR scanners are to be located will need to be rearranged/remodeled as required) so as to house the new UPS (for the 3T MR system) taking into consideration the safety, AC requirement, etc.
3. The vendor may place the chiller inside/outside the premises

Electrical works

1. The vendor should carry out necessary cabling etc from the existing power panel room to the MR site.
2. Fire alarm (along with new/existing panel) should be provided in all rooms, wherever modification is being carried out, and in the rooms (in the MRI section), where there is no fire alarm.

Air-conditioning works

1. Additional air-conditioning that is required to augment the existing air-conditioning has to be carried out by the vendor. Proper ducting and other necessary works have to be carried out without damaging existing structure.

CHECK LIST FOR TERMS AND CONDITIONS

Check list for Terms and Conditions (To be filled by the bidder and submitted along with the technical bid)

- 1) Certificate for being in business for more than 2 years _____
- 2) Certificate for sole ownership/partnership _____
- 3) Statement of financial standing from bankers _____
- 4) Performance report/List of organization supplied with the same equipment _____

- 5) Whether rates quoted include all taxes / CIF _____
- 6) Whether rates are quoted as per tenders specifications _____
- 7) Authority letter from manufacturer/principal enclosed _____
- 8) Affidavit that the firm has not been black listed in the past by any hospital/Organization _____
- 9) Affidavit that the firm has no vigilance case/CBI/FEMA case pending against _____

him/supplier(principal)_____

10) Affidavit that the firm is not supplying the same item at the lower rate quoted in the tender to any organization or any other Centre _____

11) Quotation being submitted directly by the manufacturer or authorized distributor _____

12) Quality assurance certificate like ISI, ISO-9002, IP/BP or any other, please specify _____

13) Statement of turnover/annual report for each of the last three years are attached _____

14) Bid Security amount deposited is enclosed _____

15) Literature of original catalogue of the product is attached for reference _____

16) Comprehensive Guarantee/Warranty period for _____ and thereafter comprehensive AMC (including all spares & labour) YES/NO. (Tick the option YES/NO) for further years.

17) Compliance Statement with relation to specification _____.

**(NAME OF THE BIDDER)
WITH SIGNATURE & SEAL**

The Following terms & conditions should be complied with while submitting tender

- 1) Tenders should be submitted in the office of Centre of Biomedical Magnetic Resonance, SGPGIMS Campus, Raebareli Road, Lucknow 226014, India, under the sealed cover failing which the tender shall be disqualified.
- 2) The tender terms and conditions be clearly typed or legibly written giving the full name and address of the tenderers. The tenderers should quote in figures as well as in words the rates and amount tendered by him/them. Alteration, if any unless legibly attested by the tenderers, with their full signature, shall invalidate the tender. The tender should be signed by the tenderers himself/themselves or his/their authorized agent on his/their behalf. In case the tender is signed by the agent the authority letter in his favour shall be enclosed with tender documents.
- 3) Sealed Tenders should be submitted in two-bid system (in two identical copies) consisting earnest money, technical bid & price bid along with their soft copies . In case of equipments tender the Earnest Money and Technical Bid shall be submitted in first part while price bid be submitted in second part, both separately sealed. In the price bid, all foreign exchange items should be quoted in US dollars and Indian items to be quoted in Indian Rupee only. The lowest bidder (L1) will be decided based on prices of essential items. The optional item prices will not be taken into consideration for deciding about the L1 firms. The L1 firm will have to give an undertaking that they will supply the optional items if and when required at a cost lower than the lowest cost of that particular items quoted by any of the other firm during the warranty period.
- 4) The tenderers should take care that the rates and amounts are written in such a way that interpolation is not possible. No blank space should be left, which would otherwise make the tender liable for rejection.
- 5) Delivery schedule with definite date of delivery at destination taking into cognizance of transit facilities must be indicated. This contractual delivery date/period should be inclusive of all the lead time.
- 6) The tenderers should clearly state whether he/they are manufacturer, accredited agents, or sole representative (indicating the name of Principal) on the top of the Bid.
- 7) The tenderer submitting his tender would be deemed to have considered and accepted all the terms and conditions. No Enquiries, verbal or written shall be entertained in respect of acceptance or rejection of the tender.
- 8) The quantity shown in the Schedule may be increase or decrease or any extent depending upon the actual requirement.
- 9) The tenderer shall specify after sales services facilities within the Guarantee/Warranty period. The warranty period will be extended for the period of the Instruments remain out of order during warranty period.
- 10) The tender shall also confirm the Installation, Commissioning, Demonstration and Training to the concerned of this Centre.
- 11) The tenderer shall submit the pre-requisite information like Civil works/ Electrical details etc. Within 2 weeks from the date of receipt of order or establishment of letter of credit as the case may be.
- 12) The Centre reserves the right to cancel/reject in full or any part of the tender which generally do not fulfill the conditions stipulated in the tender without assigning any reason.
- 13) Any action on the part the tender to influence anybody of the Centre will make his tender liable to rejection.
- 14) The tenderers shall submit the offer with in original copy of the tender documents duly signed on each page. Item-wise rates indicating units can be offered on letter head of the firm.
- 15) In the case of placement of Purchase Order, the vendor (the tenderers whose tender is accepted) shall have to confirm the purchase order within 7 days from the date of the dispatch of purchase order otherwise it will be deemed that offer is acceptable to the firm. Notwithstanding any other provision,

the terms & conditions and any other items given in the Purchase order will be treated as binding with "Errors & omission Expected" basis. However, if the supplier notices any mistake in the contentions of the order, he must bring the same to the notice of the Centre and seek clarifications. Supplier will have to bear the responsibility for failure to take this action.

- 16) The Centre may in writing make any revision or change in the purchase order, including additions or deletions from the quantities originally ordered in the specifications or drawings. If any such revisions/changes affect the price or delivery, the same shall be subject to the adjustment of price/delivery, where requires on a reasonable basis by mutual agreement in writing which should be communicated.
- 17) The tenderer shall also furnish performance bank guarantee of 15% of the order value or (FOB) value at the time of shipment or supply of goods and this will be relapsed after the successful completion of warrantee period.
- 18) The Centre reserves the right to cancel the purchase order or any part thereof and shall be entitled to revise the contract wholly or in part by a written notice to the vendor, if the vendor fails to comply with the terms of the purchase order including specifications and other technical requirement. The vendor becomes bankrupt or goes into liquidation. The vendor fails to deliver the goods in time and or does not replace the rejected goods promptly. A receiver is appointed for any of the property owned by the vendor.
- 19) Upon receipt of the said cancellation notice, the vender shall discontinue all works of the purchase order and matters connected with it.
- 20) Earnest Money of Rs. 5,00,000.00 (Rupees five lakhs only) be paid in shape of D/D, TDR, FDR, drawn in favour of the Director, Centre of Biomedical Magnetic Resonance, and payable at Lucknow (U.P.), India as per mentioned in the tender notification.
- 21) Unless otherwise specified in the order, the order price shall remain firm and will not be subject to escalation of any description during the pendency of the order, notwithstanding the change in the cost of materials, labor and/or variations in taxes, duties and other levies on raw materials and components that may take place while the order is under execution even if the execution of the order is delayed beyond the completion date specified in the order for any reason whatsoever.
- 22) For indigenus goods the price should be on F.O.R. CBMR SGPGIMS Campus, Lucknow basis inclusive of all levies and duties wherever applicable which should be indicated clearly. The rates of sales tax should be clearly indicated wherever chargeable. The CBMR is not eligible to issue 'C' or 'D' Form, however the concessional rate of Central Sales Tax admissible to Research Institutions on purchase of Scientific Instruments/Equipments etc. from certain States like Maharashtra., Delhi, West Bengal etc. is applicable to this Centre.
- 23) Prices will be quoted on F.O.B. as well as estimated CIF New Delhi basis for imported goods. Indian Agency commission/rebate payable to Indian Agent, if any, shall be shown separately and that will be payable in equivalent rupee directly to Indian Agent as per declaration furnished by foreign suppliers. The Centre reserves the right to get their goods air-freighted/Sea freighted & air insured/marine insured upto site.
- 24) The offer of the tenders shall remain valid for a period of 180 days from the date of opening of the tender.
- 25) All goods or materials shall be supplied by the tenderers whose tender is accepted, strictly in accordance with the specifications, drawings, data sheets, other attachments and conditions stated any alterations of those conditions shall not be made without the consent of the Centre in writing which must be obtained before any work against the order is commenced. All material furnished by the seller pursuant to this order (irrespective of whether engineering, design data or other information has been furnished, reviewed or approved by the Centre) will be guaranteed to the best quality of their respective kind (unless otherwise specifically authorized in writing by the Centre) and shall be free from faculty design (to the extent such design is not furnished to the Centre) workmanship and materials, and to be of sufficient size and capacity and of proper materials so as to fulfill in all respects with all operating conditions, if any , specified in this order.

- 26) The Equipment supplied shall carry a warranty of 60 months from the date of satisfactory Installation and commissioning of the equipment. If any trouble or defect originating with the design, materials, workmanship or operating characteristics of any materials arise at any time from the date of Installation, the same shall be promptly as possible make such alteration, repairs and replacement as soon as notified thereof, the seller shall at his own expenses and as promptly as may be necessary to permit the materials function in accordance with the specification and to fulfill the foregoing guarantee/ warranty.
- 27) The Centre may at its option, remove such defective materials at the seller's expense in which event the seller shall, without any cost to the Center for Biomedical Magnetic Resonance and as promptly as possible, furnish and install proper materials, repaired or replaced materials shall be similarly guaranteed for a period of not less 30 (thirty) months from the date of shipment.
- 28) In the event that the materials supplied do not meet the specifications and are not in accordance with the drawings, data sheets or the terms of this order, rectification is required at site, the CBMR shall notify to the seller giving full details of differences. The seller shall attend the site, within seven days of receipt of such notice to meet and correct the deficiency.
- 29) If the seller fails to attend meeting at site within the time prescribed above, the CBMR shall immediately get the same rectified the work/materials and seller shall reimburse the Centre all costs and expenses incurred by the CBMR in removing such trouble or defect
- 30) 100% payments shall be released within 30 days from the date of satisfactory receipt of materials. Where necessary performance bank guarantee @ 15% of the ordered value or FOB value shall be submitted to the Centre before arranging the delivery till expiry of warranty period.
- 31) The mode of payment will be through irrevocable letter of credit. However, Indian Agency Commission or Technical Services charges would be paid in Indian rupee after satisfactory receipt & installation of goods at site. Indian Agency Commission will be declared in the price-bid.
- 32) Time delivery as mentioned in Purchase order shall be the essence of the order and no variation shall be permitted except with prior authorization in writing from Purchaser.
- 33) In the event of delay in making delivery on the part of the vendor, it will be at purchaser's discretion to receive delivery with a reduction in price of the article/or equipment.
- 34) Forced majeure shall mean and be limited to the following :
 - a. Any war/hostilities
 - b. Any riot or civil Communication
 - c. Any earthquake, flood, tempest, lighting or other natural physical disaster
 - d. Any strike, or lock-out (only those exceeding ten continues days in duration) affecting the performance of the seller's obligations.
 - e. The seller shall advise the CBMR by registered letter duly certified by Local Chamber of Commerce of Statuary authorities the beginning and end of the above causes of delay within 7 (seven) days of occurrence and cessation of such Forced Majeure conditions, in the event of delay lasting over one month, if arising our causes of Force Majeure, the CBMR reserves the right to cancel the order and the provisions governing termination state under articles shall apply.
 - f. For delays arising out of Forced Majeure, the seller shall not claim extension in completion date for a period exceeding the period of delay attributable to the causes of Force Majeure and neither the. CBMR nor the seller shall be liable to pay extra costs provided it is Mutually established that Force Majeure conditions did actually exist
 - g. The seller shall categorically specify the extent of Force Majeure conditions prevalent in his works (such as power restriction etc.) at the time of submitting the bid and whether the same have taken into consideration or not in the quotations.
 - h. In the event of delay delivery and/or unsatisfactory manufacturing progress and supply, the CBMR has the right to cancel the purchase order as whole or in part without liability for cancellation charges.
 - i. In the event of rejection of non-confirming goods the vendor shall be allowed, without any extension of delivery time to correct the non-conformities, should however the vendor fail to do so within stipulated time, the CBMR may cancel the order.

- 35) No Payment shall be made for rejected material nor would the tenderer be entitled to claim for such items.
- 36) Rejected items would be removed by the tenderer from the site within two weeks of the date of rejection at their own cost. In case they are not removed they will be auctioned at the risk and responsibilities of the suppliers without any further notice.
- 37) In the case of not honoring the supply order, CBMR, will have the right to impose penalty as deemed fit to resort to make purchase at the suppliers cost and risk may forfeit his security to make purchase at the suppliers cost and risk
- 38) In the case of non-supply of stores within stipulated period, it will be at the desecration of the CBMR to accept delivery with late delivery clause @ 1%per week maximum to the extent of 10% of the ordered value for delayed supply.
- 39) All disputes and questions, if any arise between the Centre and the bidder out of or in connection with the terms and conditions contained herein or as to the construction of application thereof, or the respective rights and obligations of the parties there under or as to any clause or thing herein contained or by reason of the supply or failure or refusal to supply any material or as to any other matter in any way relating to these presents shall be referred to the sole Arbitration, President of the Centre/Chief Secretary of the U.P. Govt. or his nominee. The decision of the sole arbitrator shall be final and binding upon both parties and subject to adjudication of Lucknow Court. Place for arbitration shall be at Lucknow (U.P.), India. Venue of such arbitration proceedings shall be the Centre. Arbitration and conciliation Act 1996 and rules made there under shall be applied to the proceedings under this clause.
- 40) Sales-Tax Registration certificate duly attested copy by a Gazetted Officer should be also enclosed.
- 41) Sales Tax, Income Tax clearance certificate along with the affidavit from a notary that the firm has never been black listed must be attached along with the tender failing which the tender will be rejected.
- 42) Tenderers hereby agree to all terms and conditions stipulated in N.I.T. and undertake to sign the rate Contract or Supply order within the given days from the date of order failing which Security shall be liable to forfeit.
- 43) The manufacturer or their Indian representative will ensure a proper after sales service as per our requirement from time to time, against the guarantee/warranty clause as per the terms and conditions agreed under negotiations would be provided at our Centre without fail. Any negligence on this account shall be the sole responsibility of foreign vendor and the liability for compensation will be fixed up by the CBMR. A Comprehensive offer of same for 5 years would be finalized before placement of order either on comprehensive or semi/non-comprehensive basis (with or without spare/consumables/Accessories including labor charges) by the Centre to the tune of 95% uptime of equipment that AMC will be effective after expiry of warrantee period. Uptime guarantee – 95% of 365 working days per year. Downtime exceeding 5% of 365 days per year will be penalized @ Rs 15,000/- per day and the warranty/CMC will be extended by the number of days the downtime is exceeded each year.
- 44) Scanner will be housed in the CBMR at the specified site. Certain modifications in the site may be required and will be done by the vendor at his own cost**

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