

CONTACT DETAILS OF THE BODY SUBMITTING THE QUALIFICATION FILE

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List of documents submitted in support of the Qualifications File

1. Annexure – I: Affiliation Norms
2. Annexure – II: IBSC Concept Note
3. Annexure – III: Model Curriculum
4. Annexure – IV: Letter from Industry to support the proposal
5. Annexure – V: Occupational Mapping & Skill Gap Study
6. Annexure – VI: Occupational Mapping Report
7. Annexure – VII: List of IBSC Partner Institutions

SUMMARY

1	Qualification Title:	Certificate in Biomedical Maintenance
2	Qualification Code, if any	IBSC / BME / 02
3	NCO code and occupation	i. Bio-Medical Engineer – 2143.0200 ii. Biomedical Equipment Technician – 3211.0200 iii. Medical Equipment Technician – 3211.0501
4	Nature and purpose of the qualification (Please specify the duration of the certificate validity)	<p>Nature: It is a certificate Course in Medical Equipments Maintenance.</p> <p>Purpose: Learners who attain this qualification are competent in healthcare technology problem solving and troubleshooting, healthcare safety & standards, NABH & NABL accreditation, Radiation safety & Facilities / General Management.</p> <p>Qualified learners will work in mid-level career in the hospital. They need to perform maintenance of various medical equipments including basic and advance level, such as X-Ray, CT- Scan, MRI, Ultrasound, Gamma Camera and etc. Also, they need to perform administrative duties including evaluate of technical specifications and purchase of equipment or spares. Also need knowledge on computers and software to keep records of new equipments, inspections, maintenance, repair and required updates of medical equipment.</p> <p>IBSC Skill Certification would certify</p>

		bio-medical engineers & technologists, this course is a short-term training and valid for life time.
5	Body/bodies which will award the qualification	Indian Bio Medical Skill Consortium (IBSC)
6	Body which will accredit providers to offer courses leading to the qualification	Quality Council of India (QCI)
7	Whether accreditation/affiliation norms are already in place or not, if applicable (if yes, attach a copy)	Norms are in place for regulating the training centers and the assessment process. Affiliation norms are attached. Annexure - I
8	Occupation(s) to which the qualification gives access	Senior Biomedical Engineer / Senior Biomedical Technician *Title will be decided as per qualification of candidates. With engineering qualification “Engineer” & with diploma qualification “Technician”
9	Job description of the occupation	As per the training modules at the end of the training, the candidate would be certified to perform following activities - a) To perform preventive maintenance and electrical safety testing of medical equipments, laboratory equipments and systems. b) Provide technical assistance and instructions on operation and maintenance of medical equipment to clinicians and technicians. c) Contribute expertise to develop medical maintenance in standard operating procedures. d) Evaluate technical specifications to identify equipment and systems best suited for intended use and possible purchase

		<p>based on specifications.</p> <p>e) Keep records of new equipments, inspections, maintenance, repair, and required updates of medical equipment.</p> <p>f) Study technical manuals and attend training sessions provided by equipment manufacturers to maintain current knowledge.</p> <p>The detail progression is given in the item no 30 of this document.</p>
10	Licensing requirements	NOT applicable
11	Statutory and Regulatory requirement of the relevant sector (documentary evidence to be provided)	NOT Applicable
12	Level of the qualification in the NSQF	Level – 6
13	Anticipated volume of training/learning required to complete the qualification	500 hours
14	Indicative list of training tools required to deliver this qualification	<p>Syllabus, e-study materials, Sample question banks, Hands-on-workshops etc.</p> <p>List of tools and laboratories used to deliver this training program: Electronics Laboratory:</p> <ul style="list-style-type: none"> i) Digital Storage Oscilloscope ii) Function generator iii) Multiple Output DC Power Supply iv) Programmable DC Electronic Load v) Digital Touch Screen Multimeter vi) Mixed Signal Oscilloscope vii) Data Acquisition System viii) Real Time Signal Analyzer ix) Vector Network Analyzer x) Arbitrary Function generator xi) Wide band RF signal Vector Generator.

xii) Digital Storage Oscilloscope

Calibration Laboratory:

- i) Incubator Analyzer with Accessories & Automation software
- ii) Gas Flow Analyzer with Vapor with Accessories & Automation software
- iii) Infusion Device Analyzer with Accessories & Automation software
- iv) Vital Signs Simulator with Accessories & Automation software
- v) Electrical Safety Analyzer with Accessories & Automation software
- vi) Electrosurgical Analyzer with Accessories & Automation software
- vii) Defibrillator Analyzer with Accessories & Automation software

List of other Tools

1. Connecting screwdriver
2. Neon tester
3. Screw driver set
4. Long nose pliers
5. Soldering iron
6. Tweezers
7. Digital Multimeter
8. Electric drill
9. DC / AC Ammeter
10. Thermo-coupler meter
11. Watt meter
12. Insultation tester
13. Service oscillator
14. Signal tracer
15. Audio Frequency Oscillator
16. Micro Wave diathermy
17. Ultrasonic diathermy

		<p>18. ECG recorder 19. Bed Side monitor 20. Defibrillator 21. 60 mA mobile X-ray equipment 22. Surgical diathermy 23. Infusion pump 24. Syringe pump 25. Ultrasound doppler 26. CPAP 27. BIPAP 28. Nebulizer 29. Flow meter 30. Photo therapy 31. Radiant warmer 32. OT Table 33. ICU bed 34. Phono cardiogram 35. Short wave diathermy 36. EMG 37. Tread mill Test 38. Analytical balance 39. Centrifuge 40. Water bath 41. Incubator 42. Hot air oven 43. X-Ray Machine 44. CT Scan 45. MRI machine</p>
<p>15</p>	<p>Entry requirements and/or recommendations and minimum age</p>	<p>Minimum criteria: i) For Technician: Diploma in biomedical / medical electronics / electrical / any other related filed, with 2 years of experience.</p> <p>ii) For Engineers: B. E / B. Tech in Biomedical Engineering, Biomedical Instrumentation Engineering / Medical Electronics / any other related field, with 2 years of experience.</p> <p>iii) Qualification in “Certificate in</p>

	<p>Biomedical Engineering” NSQF Level – 5</p> <p>iv) Candidates who qualified IBSC modules are exempted to take the training on modules. Upon the registration to the training program the certificate will be issued to such candidates.</p>
<p>16</p>	<p>Progression from the qualification (Please show Professional and academic progression)</p> <p>Professional Progression</p> <p>After the certification, the candidate will acquire specialized skills in the field of Medical Equipment Maintenance. The candidate may further attain supervisory role as he / she progresses in their careers professionally after gaining adequate experience.</p> <p>After gaining certain experience the candidate will be promoted to higher levels such as Senior Biomedical Engineer, Biomedical Manger, Biomedical Head and so on.</p> <p>The candidate can also work in Administration or contribute to Healthcare Industry. Also, candidate can also pursue higher studies.</p> <p>Academic Progression</p> <p>For diploma candidates they can entry directly to second year of engineering program in Bio-medical. Also, they can purse degree in distance mode.</p> <p>For engineering candidates, they can pursue M. Tech Biomedical or MBA in Hospital Administration. Also, they can pursue PG programme in distance mode.</p>

17	Arrangements for the Recognition of Prior learning (RPL)	<p>When the individual has relevant experience, he is assessed through a Recognition of Prior Learning (RPL) programme.</p> <p>The candidate is assessed through a combination of theory test, practical knowledge and verbal questioning or VIVA.</p> <p>The test is designed by SME or Subject Matter Expert who prepares the test material with total integrity and objectivity.</p> <p>The candidate is administered a written test of 45 minutes and a practical test of 1.5 to 2 hours duration.</p> <p>Upon successful completion of the test the candidate is declared competent for yet to be competent, depending upon which the training is advised.</p> <p>The assessment is conducted by trained and qualified assessors appointed by IBSC. The tests are administered under strict confidentiality and absolute lack of bias or prejudice.</p> <p>For those with 5 years of experience in BME field can take direct assessment.</p> <p>In case if candidate couldn't qualify, he/she needs to under-take the training followed with assessment.</p> <p>However, it is recommended to the candidates to take required training before assessment.</p>
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18	<p>International comparability (research evidence to be provided)</p>	<p>Association for the Advancement of Medical Instrumentation, USA (AAMI) & American College of Clinical Engineering (ACCE), USA.</p> <p>ACCE is a global leader in Medical Technology Certification (applicable world-wide). IBSC has signed MoU with ACCE for bilateral acceptance of practice.</p> <p>International documentation reviewed for the same included that following –</p> <p>IBSC forges global partnership with AAMI to certify biomedical engineering professionals http://www.pharmabiz.com/NewsDetails.aspx?aid=110870&sid=1</p> <p>IBSC inks pact with AAMI https://www.biospectrumindia.com/news/74/11546/ibsc-inks-pact-with-aami.html</p>		
19	<p>Date of planned review of the qualification.</p>	<p>It is proposed that the qualification to be reviewed every three years.</p> <p>*from the date of clearance of the Qualification Pack</p>		
20	<p>Formal structure of the qualification Mandatory components Senior Biomedical Engineer / Senior Biomedical Technician 70 % of the teaching hours will be practical / videos & presentation, demonstrations and 30% will be theory.</p>			
<p>Title of component and identification code/NOSs/Learning outcomes</p>		<p>Estimated size (learning hours)</p>	<p>Level</p>	
<p>Course Code</p>	<p>NOSs</p>			
<p>MT01</p>	<p>Healthcare Technology Problem Solving and Troubleshooting</p>		<p>250</p>	<p>6</p>
<p>MT02</p>	<p>Healthcare Safety & Standards</p>		<p>50</p>	<p>6</p>

	MT03	NABH & NABL Accreditation	50	6
	MT04	Facilities / General Management	50	6
	MT05	Radiation Safety	100	6
	Sub Total		500	6
	Total duration of the program (including internship/training)			

SECTION 1
ASSESSMENT

21	<p>Body/Bodies which will carry out assessment:</p> <p>M/s MeritTrac Testing Services, Bangalore has been selected through bidding and shall conduct the online assessment test across India. Indian Bio-Medical Skill Consortium, AMTZ Campus, Visakhapatnam shall develop the content of assessment.</p>
22	<p>How will RPL assessment be managed and who will carry it out?</p> <p>IBSC conducts QP-NOS based direct three-way assessment for each and every candidate applied for recognition of prior learning (vis. Certifying the un-certified but skilled workforce who acquired skills through years of experience. Here, the candidates may undergo short-term training of gaps identified.</p> <p>1) Registration: The candidates need to submit registration form online along with uploading of scanned copies of some mandatory documents (work experiences if any). The applications will be screened on the basis of the eligibility criteria and approved candidates will be dully informed.</p> <p>2) Pre-Assessment: The candidates who has relevant experience, he is assessed through a Recognition of Prior Learning (RPL) programme. The candidate is assessed through a combination of theory test, practical knowledge and verbal questioning or VIVA. The test is designed by SME or Subject Matter Expert who prepares the test material with total integrity and objectivity. The candidate is administered a written test of 45 minutes and a practical test of 1.5 to 2 hours duration. Upon successful completion of the test the candidate is declared competent for yet to be competent, depending upon which the training is advised. The assessment is conducted by trained and qualified assessors appointed by IBSC. The tests are administered under strict</p>

	<p>confidentiality and absolute lack of bias or prejudice. Those who score more than 80% they can directly appear for final assessment. Those who score less than 80% they should undergo skill training program.</p> <p>3) Final Assessment: The shortlisted candidates from pre-assessment are finally selected for final assessment. The assessment is conducted by Indian Biomedical Skill Consortium (IBSC).</p>
23	<p>Describe the overall assessment strategy and specific arrangements which have been put in place to ensure that assessment is always valid, reliable and fair and show that these are in line with the requirements of the NSQF.</p> <p>The process of assessment followed ensures that the assessment is strictly in accordance to the qualification pack, the NOS and PCs mentioned. Validity depends upon how well the assessment actually measures the learning outcome. The test is prepared against the assessment criteria set by the IBSC, which has in turn identified the core skills and the supplementary skills in terms of NOS and PC. That the test is designed according to the assessment criteria and is prepared by subject matter experts who are established in their fields ensures the validity of the test.</p> <p>Consistency of the test is dependent on the fact that the assessment generates consistent results inspite of change in evaluators, location etc. The MCQ pattern followed for the theory rules out any element of prejudice or subjectivity on the part of the evaluator. The practical is designed in such a manner that the core skills and supplementary skills are tested and evaluated. The trained assessors who are experts in the field ensure that the test is consistent. Fairness is ensured as the students are given equal opportunity irrespective of their religion, social back ground or gender. The roll numbers assigned to the candidates conceal their identity and making the evaluation impartial.</p> <p>Assessment Guidelines:</p> <ol style="list-style-type: none">1. The criteria for assessment is based on module/s for which the candidate has enrolled out of the total course modules.2. The individual modules are mapped with specialized skill in the area of Healthcare Technology.3. Individual module carries equal weightage and marks.4. The outcome of the learning process is based on best practices adopted in Healthcare Technology. <p>The Assessment Parameters adopted during assessment:</p>

- 1) Knowledge of equipment, limitation of use of tools and equipment, and methods & procedure.
- 2) Understanding of functioning of equipment & tool, criteria to be used in selecting tools for given
- 3) job, and the process of measurement.
- 4) Skill in finishing to required measurement, handling measurement & calculations, handling tools
- 5) and equipment with ease, finishing neatly.
- 6) Abilities to take corrective steps, use correct work habits, take measurements, complete the job
- 7) within stipulated time, and adopt safe practices.
- 8) Attitude towards the work, accurate & precise work and co-workers and supervisor.

Theory Test / Internal Assessment:

- 1) The questions shall be normally of objective type involving selection of correct response rather than writing sentences.
- 2) The question paper shall contain sketches/ diagrams/ photographs/ drawing to overcome the problems of reading comprehension.
- 3) The test shall be of short duration.

Practical Test / Viva-voice:

It shall be able to test:

- 1) Manipulative skills to handle tools and equipment.
- 2) Speed in doing work.
- 3) Accuracy maintained
- 4) Quality in workmanship.
- 5) Sequence of performance.
- 6) Economical use of material.
- 7) All the competencies prescribed in the course curriculum.

Testing & Certification Process:

Application Process:

1. The candidate enrolls for the modules for assessment.
2. IBSC would declare a specific period for registration for assessment.
3. Applicant will fill the details along with supporting documents.
4. The uploaded documents will be verified & approved by IBSC.
5. Applicant can book the online examination centre as per the requirement.
6. After the online examination, IBSC will prepare the certification based on online test marks.
7. The verification & approval section will be recommended for the final certification.
8. The applicant will be communicated by Email & SMS about award of

certificate.

Assessment Process:

1. Candidate should reach the venue 45 minutes before the start of the test.
2. Candidates should carry valid training ID card or else an ID card approved by the Government of India (PAN Card, Aadhar Card, DL, etc).
3. Candidates without any identification are not allowed to take the test.

Candidates should follow these guidelines:

- a) No usage of electronic devices (mobiles and calculators) during the test
- b) No malpractice during the test hours
- c) Talking is not allowed during the test
- d) There are 30 (Varies for different QPs) multiple choice questions
- e) Each question has only one correct answer
- f) There is no negative marking
- g) Candidates need to attempt all questions to complete the test.
- h) Pencil, eraser, and white paper will be provided to all the candidates.

Examination Procedure:

- 1) Mode of Application: Online
- 2) Examination Pattern: Objective
- 3) Total number of Modules: 5
- 4) Number of questions in each module: 30
- 5) Time duration for examination of one module: 90 minutes

Qualifying Criteria:

- 1) Minimum 60% in each module is required to qualify the exam.
- 2) If any candidate has not qualified any module/s s/he can take re-exam in that module/s.

Post-assessment activities

- 1) The testing partner shall share the consolidated report (attendance sheet, results sheet) to the IBSC immediately after the completion of assessment.
- 2) IBSC will verify each application and approve the test scores.
- 3) Uploading outcome of the assessment and photos in portal by IBSC.
- 4) IBSC upload the results within one week of the assessment date.
- 5) IBSC shall maintain assessment records.
- 6) Publishing of results and Certificate issue
- 7) Certificates which will be issued carry QR code, qualified modules, technology competency score.
- 8) The certificate is issues under the aegis of NSDC and partner

	<p>affiliations.</p> <p>Direct Assessment:</p> <ol style="list-style-type: none"> 1) Candidates desire to get the skills certified have to apply online. 2) IBSC would declare a specific period for registration for assessment. 3) Applicant will fill the details along with supporting documents. 4) The uploaded documents will be verified & approved by IBSC. 5) Applicant can book the online examination centre as per the requirement. 6) After the online examination, IBSC will prepare the certification based on online test marks. 7) The verification & approval section will be recommended for the final certification. 8) The applicant will be communicated by Email & SMS about award of certificate.
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24. Assessment evidences

Title of Component: Certificate in Biomedical Maintenance

Outcomes to be assessed/NOSs to be assessed	Compulsory NOS Assessment criteria for the outcome	Total	Marks Allocated		
			Out of	Viva-Voice	Practical
IBSC / BME / MT01	PC1. Describe the preventive maintenance and electrical safety testing of medical equipments, laboratory equipments and systems.	30	5	2	3
	PC2. Describe the process of technical assistance and instructions on operation and maintenance of medical equipment to clinicians and technicians.		5	2	3
	PC3. Demonstrate the preventive maintenance and electrical safety testing		5	2	3

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	of medical equipments.				
	PC4. Describe the process of routine duties such as inspection, repair and calibration.		5	2	3
	PC5. Demonstrate skills in administrative duties like maintaining log book and related works.		5	2	3
	PC6. Explain and demonstrate the operation and maintenance of medical equipments to the doctors, nurses and technicians.		5	2	3
		Total	30	12	18
IBSC / BME / MT02	PC1. Describe the healthcare safety and standards and develop internal policy.	30	5	2	3
	PC2. Demonstrate how to carry out regular site inspection to check policies and procedures are being properly implemented.		5	2	3
	PC3. Describe the process of equipments installation, manage and organize the safe disposal of hazardous substances.		5	2	3

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	PC4. Describe the fire regulation, hazardous substances, noise, safeguarding machinery and occupational diseases.		5	2	3
	PC5. Demonstrate skill in maintaining records of inspection findings and produce reports and suggest management for correction, where needed.		5	2	3
	PC6. Describe fire regulation, adherence safe disposal of hazardous substances, safeguard machinery.		5	2	3
		Total	30	12	18
IBSC / BME / MT03	PC1. Describe the accreditation process and implement the quality and standards for better patient care.	35	5	2	3
	PC2. Ability to learn and implement consistent, evidence-based quality and safety practices.		5	2	3
	PC3. Design & implement ISO / IEC 17025:05 requirement for laboratories.		5	2	3
	PC4. Describe the process to maintain the records documents for the accreditation process.		5	2	3

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	PC5. Describe the healthcare quality and standards which are recommended by the National Accreditation Boards and implement the same in their organisations.		5	2	3
	PC6. Demonstrate skills in mapping of all medical equipments and laboratory equipments and prepare documents as per accreditation protocols.		5	2	3
	PC7. Demonstrate skills in guide & assist other Departments in the organization for the successful completion of accreditation process, and train own department's engineers & technicians.		5	2	3
		Total	35	14	21
IBSC / BME / MT04	PC1. Describe the role of Facilities & General management in the organization.	25	5	2	3
	PC2. Describe how human in and around the organization are influenced by facilities and explain and justify the new directions to the organizational performance issues.		5	2	3

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	PC3. Ability to develop and implement systematic and techniques for smooth functioning in the organization and also create and maintain a professional environment based on values and ethics.		5	2	3
	PC4. Demonstrate effective communication techniques to facilitate all aspects of sustainable development.		5	2	3
	PC5. Ability to associate with multiple teams to build functional work groups and take responsibility for outcomes.		5	2	3
		Total	25	10	15
IBSC / BME / MT05	PC1. Describe the fundamentals of radiation physics, the biological effects of radiation, radiation risks, radiation quantities and units, radiation sources.	30	5	2	3
	PC2. Describe the design and develop the radiation user's protocols as per Radiation Regulatory board and draft organizational descriptions as per individual departments requirements.		5	2	3

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	PC3. Ability to ensure that in the radiation zone, qualified / trained personnel are deployed to monitor the radiation dose administered.		5	2	3
	PC4. Demonstrate skill to train new staff by delivering trainings that include demonstrations, group work, guided practical exercise and independent studies.		5	2	3
	PC5. Describe the proper use of radiation, radiation safety and security arrangements, maintenance of records, storage and decommissioning of radiation sources and appliances.		5	2	3
	PC6. Describe the risk related to the practices and address shortcomings.		5	2	3
		Total	30	12	18
		Grand Total	150	60	90

Practical & Skill Test (pre-assessment)

After the completion of sufficient training hours, the candidates should maintain 75% of attendance. The candidates should qualify the pre-assessment test consists of both theory & skill test. Those who qualified in pre-assessment test with 75% they will be shortlisted for final assessment. Those who not qualified in pre-assessment they should reappear in the pre-assessment test.

Theory Assessment (final)

In the final assessment it consists of 30 questions in each module to evaluate the competency of the candidate.

Pass/Fail:

The minimum criteria for the passing in online examination is 60% in each module.

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SECTION 2

25. EVIDENCE OF LEVEL

Title/Name of qualification/component: Certificate in Biomedical Maintenance			Level: 6
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relates to the NSQF level descriptors	NSQF Level
Process	<p>The job holder will work in Mid-level career and need to perform routine duties such as inspection, installation, adjustment, maintenance, calibration, repairing or providing technical support to the biomedical equipment.</p> <p>Preventive maintenance and electrical safety testing of medical equipments, laboratory equipments and systems.</p> <p>Understand the policies and accreditation process and implement the same work better Quality, Patient safety and standards.</p> <p>Design and develop the standard operating procedures to improve the deliveries by individual staff in the organization.</p> <p>This is an activity which required multiple range of activities routine and predictable.</p>	<p>The job includes a wide range of activities including daily inspections and proper maintenance of medical & laboratory equipments. This include knowledge & expertise in policies and process and in healthcare field. Hence it is mapped at level - 6.</p>	6
Professional	<p>The job requires individuals to work in a team and in</p>	<p>The Applicants are able to apply their</p>	6

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Title/Name of qualification/component: Certificate in Biomedical Maintenance			Level: 6
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relates to the NSQF level descriptors	NSQF Level
knowledge	<p>close collaboration with doctors, nurses, technicians and administrative staff. They must have good knowledge on medical terminology, clinical skills, knowledge on electrical and electronics, communication and management skills, and ethical behaviour.</p> <p>They should provide technical assistance and instructions on operation and maintenance of all kind of medical equipments to clinicians and technicians.</p> <p>They should perform mapping of all medical & laboratory equipments and prepare the documents as per accreditation protocols.</p> <p>They should able to understand the healthcare safety and standards and develop the institutions policy for better Quality and Standards in Healthcare.</p>	<p>professional knowledge in Biomedical field. This includes process and principles involved in job role like providing technical assistance and instructions on operation and maintenance of medical equipment to clinicians and technicians, design and develop the institutional policies for better patient care. Hence mapped at level- 6.</p>	
Professional skill	<p>The candidates should have knowledge on working of various medical equipments and standard operating procedures. They should troubleshoot problems encountered in their routine duties and maintain documents for purchase of new equipments, log book for service breakdown and maintenance reports for</p>	<p>The Applicants are certified based on acquired professional skills like efficiency in root cause analysis. Evaluating technical specifications of high end equipments and identify systems best suited for intended use and developing standard operating</p>	6

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Title/Name of qualification/component: Certificate in Biomedical Maintenance			Level: 6
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relates to the NSQF level descriptors	NSQF Level
	<p>further references.</p> <p>They should contribute medical equipment maintenance protocols and standard operating procedures. Also, they should train the end users.</p> <p>They should evaluate technical specifications to identify equipment and systems best suited for intended use and purchase based on specifications.</p> <p>They should offer training to new staff by conducting training that includes demonstrations, group work, guided practical exercise and independent studies.</p>	<p>procedures to the medical and laboratory equipments. Hence it is mapped at level - 6.</p>	
Core skill	<p>Be update with general and specialized in medical knowledge and excellent skills in operating and maintenance procedures of all kinds of medical & laboratory equipments.</p> <p>In this process they need to provide technical support to the doctors, nurses and technicians for the proper use of medical & laboratory equipments. Also guide and supervise junior level staff.</p>	<p>The Applicants are certified based on core skills like being resourceful & adopting best practices in health care sector. The job holder should act as a lead resource person of the Department covered as well of the organization. Hence it is mapped at level - 6.</p>	6

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Title/Name of qualification/component: Certificate in Biomedical Maintenance			Level: 6
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relates to the NSQF level descriptors	NSQF Level
	They should execute multiple tasks such as administrative support to the department and organization by preparing regulations in the organization, safety disposal of hazardous substances, safeguarding machinery and educating employees on occupational diseases and etc.,		
Responsibility	<p>The Job holder works under the head of the department concerned. He is responsible for adherence to departmental needs on day to day activities.</p> <p>The major responsibilities are maintenance of medical equipments in the hospital. Need to perform daily visits to all departments and capable to attend breakdown calls if required. They should able to manage software program to maintain complete equipment log book including equipment inventory, service records, breakdown call history, and spare purchase and etc.,</p> <p>Candidate should be able to attend training sessions provided by equipment manufactures to acquire /update current knowledge in the field of Biomedical Engineering both at nationally and global levels.</p>	Applicants are rated on the basis of their ability, approach and aptitude towards the task. It is mapped at Level – 6.	6

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Title/Name of qualification/component: Certificate in Biomedical Maintenance			Level: 6
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relates to the NSQF level descriptors	NSQF Level

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SECTION 3
EVIDENCE OF NEED

26	Is this certification made mandatory by any statutory body?	
	Basis	Description
	Need of the qualification	<p>The IBSC would undertake market study and would enclose demand forecast for the proposed job role both on short-term and long-term basis to substantiate the requirement of the job role.</p>
Industry Relevance	The IBSC would undertake validation of the job roles with actual end-user	<p>The Global medical device industry is poised to reach USD 543.9 Billion by 2020 driven by the increase in the lifespan of aging individuals as well as the increasing costs of healthcare globally. The Indian medical device market is currently established at USD 5.5 Billion and is growing yearly at a steady rate of 15% CARG. A rise in the number of hospitals and the increased requirement for healthcare facilities creates a need for sophisticated devices and equipment, which can provide accurate treatment to individuals. It is expected that the Medical Equipment industry will need at least 1.0 lakh trained professionals every year and this number is likely to increase in the near future.</p> <p>Skill Gap Analysis reports for industry demand and secondary research data, though these do not lend to accurate demand projection.</p> <p>Occupation map is attached ANNEXURE – V & VI</p> <p>As per the detailed survey done by Ministry of Health &</p>

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		<p>industry where such employment are going to be generated and absorbed instead of generic validation of industry. The IBSC would submit the endorsements from users/ intended users of the qualification clearly supporting or otherwise the need for trained people against specific job role. The industry validation report is attached. ANNEXURE - IV</p>	<p>Family welfare, it is found that in India there are only 3.32 biomedical engineers per 1,00,000 population. Ministry has already urged the industry bodies and government to share the road map for biomedical engineering to take control of healthcare industry.</p> <p>The report also indicates that 60% of the medical equipments in government institutions are in an unserviceable condition due to lack of maintenance. Hence rigorous training along with strong knowledge has to be imparted to these professionals.</p> <p>Hence this certification paves the way for having a system in place for recognising the skills of biomedical engineers & apply their skills in their profession backed by a certificate.</p> <p>Feedback from industry for demand though sample size may not lend to accurate figures. Training duration, and current and potential training capacity envisaged. The Qualification Pack has been validated by the industry along with endorsements and also received validation from Association of Indian Medical Device Industry (AiMeD)</p>
Usage of the qualification		The IBSC would submit details of the employment generated (wherever	The Medical Equipment industry is the fastest growing sector of the Indian economy and the need for trained

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		<p>applicable) and realised by virtue of training in the Qualifications of the sector earlier submitted for NSQF alignment.</p>	<p>manpower is growing. The trained candidates will be employed in hospitals, medical equipment service company, medical device manufacturing industry and etc.</p>
	<p>Estimated uptake</p>	<p>The IBSC would submit the estimated uptake of the qualification and What steps were carried out to test the likely uptake of the qualification. The basis of this estimate should include data about the number of jobs or places in courses of learning which will be available to the candidates.</p>	<p>As per the Healthcare sector report, workforce requirements for the Healthcare sector is expected to grow to 74 lakhs in 2022 which is more than double its existing workforce to meet the market demand. Additionally, the major percentage of the requirement is of allied and healthcare professionals (A&HP) apart from nursing and medical doctors. It is essential to also realign the existing workforce with the required course, so that their skills can be tested and adequate knowledge and skills can be rendered for them to be called as a qualified Biomedical Engineer.</p> <p>Report: Human resource and skill requirement in Health sector is available at https://www.ugc.ac.in/skill/SectorReport/Healthcare.pdf</p>

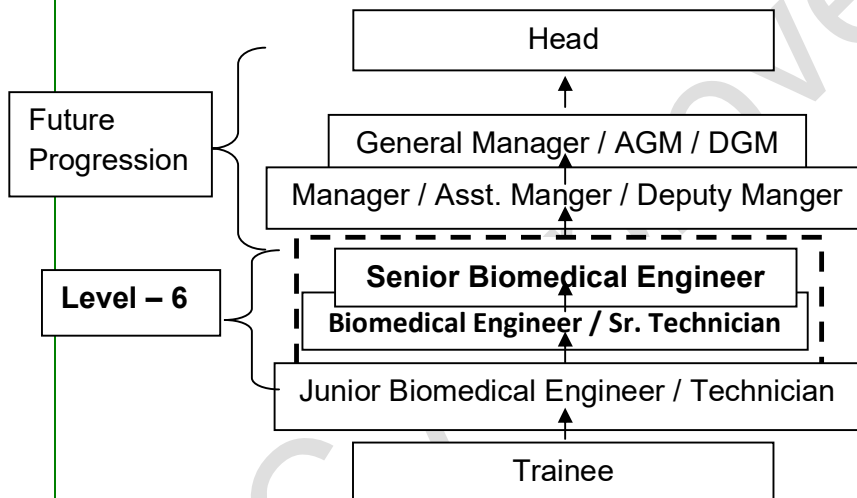
27	<p>Recommendation from the concerned Line Ministry of the Government/Regulatory Body. To be supported by documentary evidences</p> <p>Department of Health & Family Welfare</p>
28	<p>What steps were taken to ensure that the qualification(s) does (do) not duplicate already existing or planned qualifications in the NSQF? Give justification for presenting a duplicate qualification</p> <p>Sufficient research has been done to establish that the certificate course is not available for the skill development of the candidates in Biomedical Sector under the existing Sector Skill Council.</p> <p>The Certification has been mapped with the National Qualification Register, maintained by NSDA to ensure that the qualification does not duplicate. The Certification program is originally designed by core groups including Technical committee, certification committee & strategic committee. These committees are comprising of senior biomedical engineers, industrial experts and experienced academicians.</p>
29	<p>What arrangements are in place to monitor and review the qualification(s)? What data will be used and at what point will the qualification(s) be revised or updated? Specify the review process here</p> <ul style="list-style-type: none"> i. IBSC office monitors the screened candidates periodically as per the module. ii. The review report generated on the basis of previous response by the candidates & benefits candidate on the professional front. iii. The technical committee will be informed to revise the syllabus & question bank for continuous improvements. iv. Qualification is reviewed after every three years for updating according to latest technologies & practices.

SECTION 4
EVIDENCE OF PROGRESSION

30	<p>What steps have been taken in the design of this or other qualifications to ensure that there is a clear path to other qualifications in this sector? <i>Show the career map here to reflect the clear progression</i></p> <p>The Certificate in Biomedical Maintenance program designed for mid-level</p>
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professionals of “Senior Biomedical Engineer / Senior Biomedical Technician” level, is shown below. This certification programme screens potential candidates based on basic knowledge, skill and ability in in handling medical equipments and providing technical support, train clinicians and healthcare professionals on proper use of medical equipments. To understand the operation, maintenance & service of medical equipment and wide range of activities such as adapt computer hardware or software, advice hospital administrators on the planning, acquisition and use of medical equipment, disseminate knowledge about field through writing or consulting.

Certificate in Biomedical Maintenance – Career Graph



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