



GOVERNMENT OF SIKKIM
DEPARTMENT OF PERSONNEL, ADMINISTRATIVE REFORMS,
TRAINING AND PUBLIC GRIEVANCES
GANGTOK

No: ER/GOS/DOP/III/38/ 72

GEN

Dated: 25/02/2016

NOTIFICATION

The State Government is hereby pleased to notify the following rules for open competitive examination to be conducted by the Sikkim Public Service Commission in the year 2016 for selection of candidates for appointment as Bio- Medical Engineer under Health Care, Human Service & Family Welfare Department are notified here under namely:-

1. The number of vacancies to be filled on the results of the examination will be specified in the Notice issued by the Sikkim Public Service Commission.
2. The examination will be conducted by the Sikkim Public Service Commission according to syllabus and plans as indicated in the **Appendix I** to these rules.
3. The date and the place of the examination will be fixed by the Sikkim Public Service Commission.
4. Candidates must write answers in their own hand. Under no circumstances they will be allowed the help of a scribe to write the answers for them.
5. The Commission shall have discretion to fix qualifying marks in any or all subjects to the written examination.
A candidate who obtains such minimum qualifying marks in the written examination as may be fixed by the Commission shall be called for personality test. In the personality test, candidates will be asked questions on the matters of general interests, for personality test there will be a maximum of 60 marks or to be assigned by the Commission at their discretion.
6. The decision of the Commission as to the eligibility or otherwise of a candidate for admission to the written examination shall be final.
7. No candidate will be admitted to the examination unless he holds a certificate of admission issued by the Commission.
8. A candidate must pay fee as may be prescribed by the Commission.
9. A candidate who is or has been declared by the Commission to be guilty or any attempt on his part to obtain support for his candidature by any means shall render himself liable to be disqualified for admission to the competitive examination.
10. After the examination and interview, the names of the successful candidates will be arranged by the Commission in the order of merit as disclosed by aggregate marks finally awarded to each candidate. Candidates shall be considered for appointment to the available vacancies in the order in which their names appear in the list.
11. The form and manner of announcement of results of the examination shall be decided at the discretion to the Commission. The Commission will not enter in to any correspondence with any candidate regarding results.

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12. A candidate who is or has been declared by the Commission guilty of impersonation or of submitting false and fabricated documents which have been tampered with or making statements which are incorrect or false or suppressing material information or of using or of attempting to use unfair means in the examination hall or otherwise, resorting to any other irregular or improper means for obtaining admission to the examination may, in addition to rendering himself liable to be prosecution, be debarred:-
 - (a) by the Commission permanently or for specified period for admission to any examination or appearance to any interview held by the Commission for selection of candidates,
 - (b) by the State Government from any employment under them.
13. Conditions of eligibility for appearing at the competitive examination shall be as indicated in the Appendix II to these rules.
14. Candidates already in Government service or in Government owned undertaking or similar organizations, whether permanent or temporary capacity or as workcharged employee shall be required to submit their application alongwith the 'No Objection Certificate' from their employer.
15. Success in the examination confers no right to appointment unless Government is satisfied after such enquiry as may be considered necessary that a candidate having regard to his character and antecedents is suitable in all respects for appointment.
16. A candidate must be in good mental and bodily health and free from any physical defect likely to interfere with the discharge of his duties as an officer of the Service. A candidate who (after such medical examination as may be prescribed by the competent authority) is found not to satisfy these requirements will not be appointed.
17. If a candidate's handwriting is not easily legible, a deduction may be made in this account from the total marks otherwise accruing to him/her.
18. Credit will be given for good English including orderly, effective and exact expression combined with economy of words in all subjects of the examination and not only in subjects, which are especially devoted to English.
19. No traveling and daily allowance will be paid for the journey performed in connection with the examination, interview and medical examination.
20. The candidate on selection and during the period of probation/apprenticeship/training, shall be entitled to such salaries and allowances as specified in the Notification No. 489/GEN/DOP, dated 31/10/2011.
21. All other matters not specified or for which no provision has been made in these rules shall be regulated by rules and orders applicable to the service to which recruitment is being made.

By order and in the name of the Governor.

JOINT SECRETARY TO THE GOVERNMENT

Copy to:-

1. Secretary, S.P.S.C.,
2. File and,
3. Guard file.

APPENDIX - I

**SCHEME AND SYLLABUS OF EXAMINATION FOR THE PURPOSE OF
FILLING UP THE POST OF BIO-MEDICAL ENGINEER.**

The examination will consist of 2 papers:-

PAPERS	SUBJECT	FULL MARKS	TIME ALLOWED
PAPER-I	General English & General Knowledge	100	1.30 hours
PAPER-II	Bio-Medical Engineering	300	3.00 hours

VIVA-VOCE/PERSONALITY 50

2. PAPER-I: GENERAL ENGLISH:

The question will be designed to test the candidate's understanding and command of the English language. *The question will be of Conventional Type.*

English: Candidate will be required to answer questions designed to test their understanding of English and workman like use of words. The patterns of questions would be broadly as follows:-

- (1). Comprehension of given passage.
- (2). Précis writing
- (3). Usages and Vocabulary
- (4). Short essay.

General Knowledge: Knowledge of current events of local, National and International importance and of such matter of everyday observation and experience in their scientific aspects as may be expected of any educated person who has not made a special study of any scientific subject. The paper will also include questions on Modern history (from 1857 onwards) of India, Indian culture, Indian policy, Indian economy and Geography of India of such nature as candidates should be able to answer without Special Study and questions on the techniques of Mahatma Gandhi. The question will be objective type.

3. PAPER-II: BIOMEDICAL ENGINEERING.

The questions will be conventional type and will cover areas of knowledge of the following subject and topics:-

- (1). **ANATOMY:** - Basic tissues of body (General), Muscular Tissue-major muscles of the body, Nervous tissue-brain, spinal cord, Meninges, PNS, Bones tissue-structure, development and growth, bones of appendicular and axial skeleton system in brief, classification and types, movement at joints, Respiratory system- parts and structure of lungs, Urinary system-kidney, ureter, bladder, Digestive system parts, Special senses eye, ear, nose and skin, Cardiovascular system-heart-chambers, blood supply and nerve supply.
- (2). **PHYSIOLOGY:** - Resting membrane potential and action potential, Synaptic transmission, EEG principles, Sensory system-receptor potential, Peripheral nervous system-organization, reflex action and circuits, Skeletal muscle contraction process-isotonic and isometric contractions, EMG principles, Cardiovascular system-principals, Respiratory system-organization, functional anatomy, ventilation, exchange, transport, feedback regulation, principles of artificial respiration, Visual functions-camera principle, refractory errors and correction, Ear mechanics of hearing, tests of hearing and Audiogram.

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- (3). **BIO-INSTRUMENTATION:** - Study of bio-electric signals & electrodes, Transducers-classification, performance characteristics, displacement, position and motion transducers, pressure transducers, biosensors, Blood pressure & blood flow measurement, Study of therapeutic equipments-pacemakers, diathermy, haemodialysers, lithotripter, anesthesia machine, ventilator, infusion pump, infant incubator, Study of surgical devices-electrosurgical unit, LASER, endoscope, Cardiac assist devices-heart lung machine, difbreillator, Study of audiometer and hearing aids, Pulse oximeter.
- (4). **BIOMECHANICS & BIODYNAMICS:-** Kinematic concept for analyzing human motion, Kinetic concept for analyzing human motion, Linear and angular kinetics of human movement, Strength, Muscular power and endurance, Flexibility, Application of aerodynamics in sports-aerodynamic drag force, effects of drag on the body and objects in sports, aerodynamic lift force, effects of lift on projected objects and the body, lift force produced by spin: the Magnus effect, Application of hydrodynamics in swimming-buoyancy and flotation, resistance and propulsion, resistive forces in swimming skills, propulsive forces in swimming skills, swimming efficiency and speed, Sports medicine and rehabilitation.
- (5). **PHYSIOTHERAPY:** - Physiology of pain and pain modulation, Pain reliving modalities 1: role of TENS, interferential current therapy, Pain reliving modalities-2: superficial heating modalities, short wave diathermy, ultra sound, Laser, Electrical stimulation of nerves and muscles: types of current, wave forms, surging, accommodation, uses, Gait and gait analysis system, Physiology of balance, analysis of balance, instrumentation-forceplatforms, Cardiac and pulmonary rehabilitation-analysis and training instrumentation including ergometer, treadmill.
- (6). **MEDICAL IMAGING SYSTEM:** - X-ray machines-basic of diagnostic radiology, nature of X-rays, Production of X-rays, X-ray machine, visualization of X-ray.
X-ray Computed Tomography-computed tomography, system components.Nuclear Medical imaging systems-radioisotopes in medical diagnostics, physics of radiology, radiation detectors, pulse height analyser, uptake monitor equipment, radioisotope rectilinear scanner, the gamma camera, PET scanner.
Magnetic resonance imaging scanner-principles of NMR imaging systems, image reconstruction techniques, basic NMR components, biological effects of NMR imaging, advantages of NMR imaging systems.
Ultrasonic imaging systems-diagnostic ultrasound, physics of ultrasonic waves, medical ultrasound, basic pulse-echo apparatus, A-scan, Echocardiograph (M-mode), B-scanner.
Thermal imaging systems-medical thermography, physics of thermography, infrared detectors, thermographic equipments.
- (7). **BIOMATERIAL:** - A brief discussion of: metallic biomaterials, ceramic biomaterials, polymeric biomaterials, composite biomaterials. Soft tissue replacement, hard tissue replacement, bone repair and joint implants-dental implants.

(8). **ARTIFICIAL ORGANS:** - Artificial kidney-structure and function of the kidney, kidney diseases, renal failure, treatment of renal failure, renal transplantation.

Liver support system-morphology of the liver, liver functions, hepatic failure, liver support system, global replacement of liver functions, hybrid replacement procedures.

Artificial Pancreas-structure and function of pancreas, endocrine pancreas and insulin secretion, diabetics, insulin, insulin therapy, therapeutic options in diabetics, insulin administration systems.

Artificial blood: modern history of blood transfusion and blood substitutes, blood components and characteristics, blood substitutes and hemodilution, crystalloid solutions as volume expanders.

Artificial skin: a vital function of skin, current treatment of massive skin loss.

(5). **VIVA-VOICE :** - The candidates will be interviewed by the Commission who will have before them a record of his career. He will be asked questions on matters of general interest. The object of the interview is to assess the personality suitability of the candidate for the service post.

The test is intended to judge the mental caliber of candidate. In broad terms this is really an assessment of not only his intellectual qualities but also social traits and his interest in current affairs. Some of the qualities to be judged are mental alertness, critical powers of assimilation, care and logical exposition, balance of judgment, variety and depth of interest, ability for social cohesion and leadership intellectual and moral integrity.