प्रदेश लोक सेवा आयोग, कर्णाली प्रदेश

प्रदेश निजामती सेवाको स्वास्थ्य सेवा, विविध समुह, वायोमेडिकल ईन्जिनियरिङ्ग उपसमूह, अधिकृतस्तर सातौं तहको खुला लिखित प्रतियोगितात्मक परीक्षाको पाठ्यक्रम र परीक्षा योजना

परीक्षा योजना (Examination Scheme)

परीक्षाको चरण	परीक्षाको किसिम	पूर्णाङ्क
प्रथम	लिखित परीक्षा	२००
अन्तिम	सामुहिक परीक्षण र अन्तर्वार्ता	४०

१. प्रथम चरणः लिखित परीक्षा योजना

पत्र	विषय	पूर्णाङ्क	उत्तिर्णाङ्क	परीक्षा प्रणाली	प्रश्नसंख्या×अङ्क	समय
प्रथम	बायोमेडिकल इन्जिनियरिङ्ग सम्बन्धी	१००	४०	बस्तुगत बहुवैकल्पिक (MCQs)	१००x१अङ्क	१ घन्टा ३० मिनेट
द्वितीय		१००	४०	विषयगत (Subjective)	६प्रश्न x१०अङ्क ८ प्रश्न x५अङ्क	३ घन्टा

२. अन्तिम चरणः सामुहिक परीक्षण र अन्तर्वार्ता (Group Test and Interview)

विषय	पूर्णाङ्क	परीक्षा प्रणाली	समय
सामूहिक परीक्षण (Group Test)	१०	समूहमा व्यक्तिगत प्रस्तुती (Individual Presentation in Group)	३० मिनेट
व्यक्तिगत अन्तर्वार्ता (Individual Interview)	३०	मौखिक (Oral)	

द्रष्टव्यः

१. यस पाठ्यक्रमलाई प्रथम चरण र अन्तिम चरणमा विभाजन गरिएको छ।

२. परीक्षाको माध्यम भाषा नेपाली वा अंग्रेजी अथवा नेपाली र अंग्रेजी दुवै हुन सक्नेछ।

३. बस्तुगत बहुवैकल्पिक (Multiple Choice) प्रश्नहरुको गलत उत्तर दिएमा प्रत्येक गलत उत्तर वापत २० प्रतिशत अङ्क कट्टा गरिनेछ। तर उत्तर नदिएमा त्यस वापत अङ्क दिईने छैन र कट्टा पनि गरिने छैन।

४. विषयगत प्रश्नहरुको हकमा तोकिएको अङ्कमा एउटा लामो प्रश्न वा एउटै प्रश्नका दुई वा दुई भन्दा बढी भाग (Two or more parts of a single question) वा एउटा प्रश्न अन्तर्गत दुई वा बढी टिप्पणीहरु (Short notes) सोध्न सकिनेछ।

५. परीक्षा हलमा मोवाइल वा यस्तै प्रकारका विद्युतीय उपकरण, पुस्तक, नोटबुक, झोला लगायतका बस्तुहरु लैजान पाइने छैन।

६. परीक्षामा सोधिने प्रश्नसंख्या, अङ्क र अङ्कभार यथासम्भव सम्बन्धित पत्र/विषयमा दिईए अनुसार हुनेछ।

७. विषयगत प्रश्न हुने पत्र/विषयका प्रत्येक भाग/खण्डका लागि छुट्टाछुट्टै उत्तरपुस्तिकाहरु हुनेछन्। परीक्षार्थीले प्रत्येक भाग/खण्डका प्रश्नहरुको उत्तर सोही भाग/खण्डको उत्तरपुस्तिकामा लेख्नुपर्नेछ।

८. यस पाठ्यक्रम अनुसारका पत्र/विषयका विषयवस्तुमा जुनसुकै कुरा लेखिएको भए तापनि पाठ्यक्रममा परेका कानून, ऐन, नियम तथा नीतिहरु परीक्षाको मिति भन्दा ३ महिना अगावै संशोधन भई कायम रहेका विषयवस्तुलाई यस पाठ्यक्रममा परेको सम्झनु पर्दछ।

९. प्रथम चरणको लिखित परीक्षाको कुल प्राप्ताङ्कको आधारमा लिखित परीक्षाको नतिजा प्रकाशित गरिनेछ।

१०. प्रथम चरणको लिखित परीक्षामा छनौट भएका उम्मेदवारहरुलाई मात्र अन्तिम चरणको सामूहिक परीक्षण र अन्तर्वार्तामा सम्मिलित गराइनेछ।

११. प्रथम चरणको लिखित परीक्षा र अन्तिम चरणको सामूहिक परीक्षण र अन्तर्वार्ताको कुल प्राप्ताङ्कको आधारमा अन्तिम परीक्षाफल प्रकाशित गरिनेछ।

१२. पाठ्यक्रम लागू हुने मितिः २०८०।११।०२

प्रदेश लोक सेवा आयोग, कर्णाली प्रदेश

प्रदेश निजामती सेवाको स्वास्थ्य सेवा, विविध समुह, वायोमेडिकल ईन्जियरिङ्ग उपसमूह, अधिकृतस्तर सातौ तहको खुला प्रतियोगितात्मक लिखित परीक्षाको पाठ्यक्रम र परीक्षा योजना

प्रथम र द्वितीय पत्रः बायोमेडिकल इन्जिनियरिङ्ग सम्बन्धी

1. Cell Biology, Immunology & Tissue Device Interaction

1.1 Cell biology: Cell structure, Procaryotic vs. Eukaryotic cells, Cell division, Apoptosis and oncogenic transformation.

1.2 Biomolecules: Proteins, carbohydrates, lipids, nucleic acid.

1.3 Molecular biology and genetics: DNA, RNA and Protein synthesis, Mutation and repair; Techniques of genetic engineering.

1.4 Immunology: Types of immunity, Antigen and antibody, Antigen-Antibody reactions, Hypersensitivity and Autoimmunity.

1.5 Tissue Device Interactions: Inflammation, wound healing and foreign body response, Endothelial cells & ECM-biomaterial interaction, Blood-biomaterials interaction, Bacteria and biomaterials.

2. Human Anatomy and Physiology

2.1 Introduction to Human Body: Body design at structure-function level, Interpretation of the molecular cell biology to the development of body organs & system, Appreciation of the control & regulation of body function, The Cells, Tissues & Organization of the Body, Structure & function of different types of cells & tissues, Cell to cell transport mechanisms.

2.2 Composition of Blood: Erythrocytes (RBCs), leukocytes (WBCs) and platelets and their functions. Clotting factors, Haematopoesis, Haematopoetic stem cell, Differentiation and maturation of haematoblast into RBCs, WBCs and Platelets, Hemostasis. Components of coagulation cascades, Extrinsic, intrinsic and common path way of coagulation cascades.

2.3 The Cardiovascular System: Anatomy of heart & blood vessels, Study of blood supply of heart or coronary circulation, Blood circulation from different organs to the heart & from the heart to different organs, heart functions, cardiac cycle, cardiac output & blood pressure, Conduction system of heart.

2.4 The Respiratory System: Anatomy-physiological relationship of upper respiratory tract, Lungs & its topography. Pleura & pleural cavity, lung functions, Mechanism of breathing, types of breathing & control of respiration, Ventilation & Lung volumes, Gas transfer & diffusion

2.5 The Digestive System: Structure of oral cavity & underlying glands, Teeth systems (functions & abnormalities), Structure of alimentary system, Functions of stomach, intestine & role of smooth muscle of gut, Digestion, secretion & absorption capacity of gut, Structure-function relationship of liver, billiary tract & gall bladder, Pancreas & its functions, Revision of metabolic functions of body.

2.6 The Urinary System: Topography of kidneys, Microanatomy of kidney, Role of kidney in salt-water balance, Structure-function relationship of ureter, bladder & urethra, Control of bladder function, Renal & urinary diseases.

2.7 The Nervous System: Microanatomy of nerve cell (neurons), arrangement of neurons, types and their connections, Functions of nerve cell, impulse generation, neuromuscular transmission, Structure of central nervous system (CNS), Identification of underlying areas of brain.

2.8 Sensory Organs: Structural details of human ear (external, middle and internal ear), Hearing and functions of ear, Structural details of human eye, eyesight physiology, Introduction to sense of smell and taste.

3. Implantable Devices

3.1 Cardio vascular Implants: Heart valves: Single leaflet, Bi-leaflet, Bioprosthetic, Vascular grafts: Artificial and biological, Stents, catheters and cannulas, Pacemakers, Inferior venacava filters, Intraaortic balloon pump, Ventricular assist device.

3.2 Orthopaedic Implants: Biomaterials used in orthopaedic implants, Total Hip Replacement, Total Knee Replacement.

3.3 Urology Implants: Materials used in urology implants, Urethral catheters, Urology stents.

3.4 Introduction to Artificial Organs: Artificial pancreas, liver, heart, lung, skin, reproductive organs, hearing implant and artificial vision.

3.5 Plastic Surgery implants: Materials used in plastic surgery implants, Types and procedures of breast implants, Gels and fillers in plastic surgery.

3.6 Tissue Engineering: Introduction and basic procedure of cell culture

4. Bio-engineering Materials and Components

4.1 Bio-materials: Introduction to Bio-materials and bio-compatibility, Classes of materials used in medicine.

4.2 Metals: Introduction, structure, chemistry, mechanical properties and applications of various metals relating to bio-materials.

4.3 Polymers: Introduction, Types of polymers used in medicine and Hydrogel.

4.4 Ceramics, Glasses and Composites: Structure, chemistry and properties of ceramics and glasses used in medical devices, Types of bio-ceramics.

4.5 Natural Materials: Types, Collagen: Structure, Physical modification, Chemical Modification, Proteoglycans and glycosaminoglycans, Elastin & their Graft Copolymers

5 Biomechanics

5.1 Human joints: Classification and forces in joints (elbow, shoulder, hip, knee, spine, ankle, wrist)

5.2 Mechanics of hard tissues: Bone growth and development, fracture mechanics, mechanical properties of cortical and cancellous bones.

5.3 Mechanics of soft tissues: Mechanical properties of collagen, elastin, ligaments & tendons, articular cartilage, skeletal and cardiac muscles.

5.4 Biofluid Mechanics: Introduction to biofluids, basics of blood rheology.

Section-B

6. Medical Imaging

6.1 X-ray Equipment: X-ray production and methods, X-ray tubes, Stationary and Rotating anode, X-ray control and indicating equipment, Filters and grids, Fluoroscopy, Biological Effects of X-rays.

6.2 Computed Tomography (CT): Introduction, Basic Principles, Generation of CT, System Components.

6.3 Magnetic Resonance Imaging (MRI): Fundamental Concepts, Principles of Parameters of MRI, Basic Principles of MRI and Related Parameters Image formation, Contrast Enhanced MRI, Clinical Application.

6.4 Ultrasonography (USG): Physics of Ultrasound, Construction and Properties of Ultrasound Transducer, Ultrasonic Beam, Modes of Ultrasound Imaging, Doppler Ultrasound and its clinical application, Biological Effects of Ultrasound.

6.5 Digital Imaging: Introduction, Digital Radiography, PACS (Picture Archiving and Communicating System)

6.6 Basics of radioisotopes imaging: Types of radioactivity, radionuclide/radiopharmaceutical, SPECT and PET.

7 Biomedical Instrumentation

7.1 Fundamental of Medical Instrumentation: Sources of Biomedical Signals, Basic Medical Instrumentation System, Performance Requirements of Medical Instrumentation Systems, Intelligent Medical Instrumentation Systems, General Constraints in Design of Medical Instrumentation, Systems Regulation of Medical Devices.

7.2 Signals and Electrodes: Bioelectric potential, Resting potential, Action potential, Propagation of action potential, Biological signals, Electrodes, Bio-potential electrodes, Microelectrodes, Skin surface electrodes.

7.3 Physiological Transducers: Introduction, Classification of Transducers (active and passive), Performance Characteristics of Transducers, Displacement, Position and Motion, Transducers, Pressure Transducers, Transducers for Body Temperature Measurement, Photoelectric Transducers, Optical Fiber Transducers, Optical Fiber Sensors, Biosensors, Smart Sensors.

7.4 Biomedical Recorders: Electrocardiograph (ECG), Electroencephalograph(EEG), Electromyograph (EMG), Biofeedback Instrumentation.

7.5 Patient Monitoring System: Concept, Cardiac Monitor, Beside Patient Monitoring Systems, Central Monitors, Measurement of Heart Rate, Measurement of Pulse Rate, Blood Pressure Measurement, Measurement of Temperature, Measurement of Respiration Rate, Catheterization, Laboratory Instrumentation.

7.6 Arrhythmia and Ambulatory Monitoring Instruments: Cardiac Arrhythmias,

Arrhythmia Monitor, QRS Detection Techniques, Exercise Stress Testing, Ambulatory Monitoring Instruments.

7.7 Fetal Monitoring Instruments: Cardiotocograph(CTG), Methods of Monitoring Fetal Heart Rate, Monitoring Labor Activity, Recording System.

7.8 Biomedical Telemetry and Telemedicine: Wireless Telemetry, Single Channel Telemetry Systems, Multi-patient Telemetry, Multi-channel Wireless Telemetry Systems, Implantable Telemetry System, Transmission of Analog Physiological Signals, Telemedicine.

7.9 Oximeters: Ear Oximeter, Pulse Oximeter, Skin Reflectance Oximeters, Intravascular Oximeter.

7.10 Blood Flowmeters: Electromagnetic Blood Flowmeter, Types of Electromagnetic Blood Flowmeter, Ultrasonic Blood Flowmeters, NMR Blood Flowmeters, Laser Doppler Blood Flowmeter.

7.11 Cardiac Output Measurement: Indicator Dilution Method, Dye Dilution Method, Thermal Dilution Techniques, Measurement of Continuous Cardiac Output Derived from Aortic Pressure Waveform, Impedance Technique, Ultrasound Method.

7.12 Pulmonary Function Analyzers: Pulmonary Function Measurements, Spirometry, Pneumotachometers, Measurement of Volumes, Pulmonary Function Analyzers.

7.13 Clinical Laboratory Equipment: Medical Diagnosis with Chemical Tests, Spectrophotometry, Spectrophotometer type Instruments, Colorimeters, Biochemistry Analyzers, Electrolyte Analyzers, Microscope, Centrifuge, ELISA reader and washer, Biosafety Cabinet, Autoclave.

7.14 Blood Gas Analyzers: Acid Base Balance, Blood pH Measurements, Measurement of Blood PCO_2 and Blood pO_2, Intra-Arterial Blood Gas Monitoring, Complete Blood Gas Analyzer.

7.15 Blood Cell Counters: Methods of Cell Counting, Coulter Counters, Automatic Recognition and Differential Counting of Cells.

7.16 Audiometers and Hearing Aids: Mechanism of Hearing, Measurement of Sound, Basic Audiometer, Pure Tone Audiometer, Speech Audiometer, Audiometer System Bekesy, Evoked Response Audiometry System, Calibration of Audiometers, Hearing Aids.

7.17 Cardiac Pacemakers: Need for Cardiac Pacemaker, External Pacemaker, Implantable Pacemakers, Recent Development in Implantable Pacemakers, Pacing System Analyzer.

7.18 Cardiac Defibrillators: Need for a Defibrillator, DC Defibrillator, Pacer-cardioveter-defibrillaror, Defibrillator Analyzers.

7.19 Instruments for Surgery: Principle of Surgical Diathermy, Surgical Diathermy Machine (Mono-polar and Bi-polar), Safety Aspects in Electro-surgical units.

7.20 Laser Applications in Biomedical Field: Principle of Laser, Pulsed Ruby Laser, Nd-YAG Laser, Helium-Neon Laser, Argon Laser, CO_2 Laser, Excimer Lasers, Semiconductor Lasers, Laser Safety.

7.21 Physiotherapy and Electrotherapy Equipment: High Frequency Heat Therapy,

Short-ware Diathermy, Microwave Diathermy, Ultrasonic Therapy Unit, Electrodiagnostic/Therapeutic Apparatus, Pain Relief Through Electrical Stimulation.

7.22 Hemodialysis Machines: Function of the Kidneys, Artificial Kidney, Dialyzers, Membranes for Hemodialysis, Hemodialysis machine.

7.23 Lithotripters: The Stone Disease Problem, Conventional Lithotripter Machine, Modern Lithotripter Systems, Extra-corporeal Shock-wave Therapy.

7.24 Anesthesia Machine: Need for Anesthesia, Anesthesia Machine, Introduction, Types and Electronics parts in Anesthesia Machine.

7.25 Ventilators: Mechanisms of Respiration, Artificial Ventilation, Ventilators (types, terms and classification), Pressure-volume-flow Diagrams, Modern Ventilators, High Frequency Ventilators, Humidifiers, Nebulizers and Aspirators.

7.26 Automated Drug Delivery Systems: Components of Drug Infusion Systems, Closed-loop Control in Infusion Systems, Examples of Typical Infusion Pumps and syringe pumps.

7.27 Patient Safety: Electric Shock Hazards, Leakage Currents, Safety Codes for Electro-medical Equipment, Electrical Safety Analyzer.

Section-C

8. Electronic Devices and Circuits

8.1 Integrated Circuit Technology

8.2 Overview of DC and AC diode models, JFET models, bipolar transistor models, MOS transistor models.

8.3 Operational Amplifier Circuits.

8.4 Bias circuits suitable for IC design.

8.5 The differential amplifier.

8.6 Applications of operational amplifier.

8.7 Power Supplies and Voltage Regulators.

8.8 Half-wave and full-wave rectifiers.

8.9 Capacitive filtering.

8.10 Zener diodes, bandgap voltage references, constant current diodes.

8.11 Zener diode voltage regulators.

8.12 Untuned and Tuned Power Amplifiers.

8.13 Amplifier classification.

8.14 Direct-coupled push-pull stages.

8.15 Transformer-coupled push-pull stages.

8.16 Tuned power amplifiers

8.17 Oscillators: principles, types, criteria

8.18 Thyristor

8.19 IGBT, DIAC, TRIAC

8.20 Voltage-to-frequency converters.

8.21 LC Filters, RC Filters, Active Filters.

9. Digital Electronics and Microprocessors

9.1 Logic Gates: Truth tables and Boolean expressions

9.2 Universal gates and gate conversion

9.3 DeMorgan's theorem and Karnaugh map

9.4 Combinational Logic Devices

9.5 Encoder and Decoder

9.6 Multiplexer and Demultiplexer

9.7 Half and Full: Adder and Subtractor.

9.8 Sequential Logic Circuits: Latches and Flip flops, state diagram.

9.9 Asynchronous and synchronous counters.

9.10 Shift Registers: SISO, SIPO, PISO, PIPO.

9.11 Microprocessor architecture 8085 & 8086.

9.12 Bus Structure and Memory interfacing with 8085.

9.13 Bus structure, synchronous and asynchronous data bus, address bus.

9.14 Static and dynamic RAM, ROM, PROM, EPROM, EEPROM.

9.15 Input/Output Interfaces for serial communication.

9.16 Asynchronous interface: ASCII code, baud rate, start bit, stop bit, parity bit Synchronous interface

9.17 RS-232 standard

9.18 Basic Interrupt Processing

9.19 Interrupt service routine requirements.

9.20 Interrupt priority, Maskable and Non-maskable interrupts, software interrupts, traps.

10. Digital Signal Processing

10.1 Introduction to Discrete Signal and Systems

10.2 Discrete signals –unit impulse, unit step, exponential sequences

10.3 Linearity, shift invariance, casualty

10.4 Convolution summation and discrete systems, response to discrete inputs

10.5 Stability, DSP and its properties

10.6 Sampling continuous signals–spectral properties of sampled signals

10.7 Basics of IIR and FIR filters

11. Control Systems

11.1 System Modeling

11.2 Differential equation and transfer function

11.3 State-space formulation of differential equations

11.4 Mechanical components and Electrical components: mass, spring, damper, inductance, capacitance, resistance, sources, motors, tachometers, transducers

11.5 Routh-Hurwitz stability criteria

11.6 Frequency domain characterization of systems

11.7 Bode amplitude and phase plots, Effects of gain and time constants on Bode diagrams, Stability from the Bode diagram.

11.8 Nyquist plots, Correlation between Nyquist diagrams and real time response of systems: stability, relative stability, gain and phase margin, damping ratio.

12. Communication Systems

12.1 Analog and digital communication sources, transmitters, transmission channels and receivers.

12.2 Types and reasons for modulation

12.3 Amplitude modulation and demodulation

12.4 Frequency Modulation (FM) and Phase Modulation (PM)

12.5 Distortion, noise, and interference

12.6 Nyquist sampling theory, sampling of analog signals, spectrum of a sampled signal

12.7 Sampling theorem for band-limited signals, effects of aliasing, reconstruction of sampled signals

Section D

13. Medical Industry Management

13.1 Introduction to Medical Industry: Concept, Classification of medical devices (Class I, IIa, IIb, III), Introduction to ISO, CE marking, FDA

13.2 Selection, purchase and management of Medical equipment: Need analysis, Specification preparation.

13.3 Various procurement methods: Direct purchase, Sealed quotation, Tender, Incoming inspection and commissioning.

13.4 Public Procurement Act, 2063 and Public Procurement Regulations, 2064

13.5 Preventive maintenance, Corrective maintenance, Annual Maintenance Contract, Comprehensive Maintenance Contract, Decommissioning.

13.6 Basics of hospital management: Hospital traffic flow, Architectural planning of Hospital.

13.7 Basics of Patient Management system and Laboratory management system

14. Engineering Professional Practice

14.1 Codes of ethics and guidelines for professional engineering practice

14.2 Relationship of the engineering profession to basic science and technology and other Professions

14.3 Engineering Professional Bodies (Nepal Engineering Council, Nepal Engineers Association) and their roles/responsibilities

14.4 Legal Aspect of Professional Engineering in Nepal: The Nepalese legal system affecting the practice of engineering, Provision for private practice & for employee engineers, Contract law, Contract documents, Tendering, Liability and Negligence, Business and Labor laws, Relationship to foreign firms working in Nepal

अंकभार विभाजन **(Marks Division)**

प्रथम र द्वितीयपत्रको लागि यथासम्भव निम्नानुसार प्रश्नहरु सोधिने छ ।

प्रथमपत्र (वस्तुगत)				
पत्र	खण्ड **(Section)**	परीक्षा प्रणाली	अङ्कभार	प्रश्न संख्या× अङ्क
प्रथम	**(A)**	बहुवैकल्पिक प्रश्न (MCQs)	३०	३० प्रश्न× १अङ्क= ३०
	(B)		३०	३० प्रश्न× १अङ्क= ३०
	(C)		३०	३० प्रश्न× १अङ्क= ३०
	(D)		१०	१० प्रश्न× १अङ्क= १०
द्वितीयपत्र (विषयगत)				
पत्र	खण्ड **(Section)**	परीक्षा प्रणाली	अङ्कभार	प्रश्न संख्या× अङ्क
द्वितीय	**(A)**	विषयगत (Subjective)	३०	२ प्रश्न× १० अङ्क= २० २ प्रश्न× ५ अङ्क= १०
	(B)		३०	२ प्रश्न× १० अङ्क= २० २ प्रश्न× ५ अङ्क= १०
	(C)		२०	१ प्रश्न× १० अङ्क= १० २ प्रश्न× ५ अङ्क= १०
	(D)		२०	१ प्रश्न× १० अङ्क= १० २ प्रश्न× ५ अङ्क= १०

सामूहिक परीक्षण

सामुहिक परीक्षण व्यक्तित्व परीक्षणको एक अंश हो। प्रदेश निजामती सेवाको क्षेत्र विस्तार तथा कार्य पद्धति परिवर्तन समेत भैरहेको सन्दर्भमा नेपाल सरकार र प्रदेश सरकारका नीति, योजना, कार्यक्रम लगायत शासन व्यवस्था सम्वन्धी समसामयिक विषयमाथि विचारविमर्श –, छलफल गरी तिनको अझै बढी प्रभावकारी तथा कार्यान्वयन योग्य समाधान पहिल्याउने सम्बन्धमा उम्मेदवारहरुको क्षमता पहिचान गर्नु यस परीक्षणको मूलमर्म हो। यसको लागि छलफल, विचारविमर्श गरी परिस्थिति बुझ्न सक्ने –, निर्णय दिने, जनतालाई क्रियाशील बनाउने, चित्त बुझाउने, निर्धारित लक्ष्य अनुसार काम गर्ने/गराउने, जस्ता कामका लागि लेखन क्षमताका साथसाथै समस्यालाई यथार्थपरक ढंगले पहिचान गर्नसक्ने, वाकपटुता, शिष्टता, तर्कशक्तिको पनि आवश्यकता पर्दछ।

त्यसैले यस परीक्षणमा उम्मेदवारहरुको वौद्धिक क्षमता, संचार सीप, समूह गतिशिलता, व्यवहार, व्यक्तित्व, मनोवृति, क्रियाशीलता, निर्णयशक्ति, समस्या समाधान क्षमता, नेतृत्व क्षमता, समय व्यवस्थापन तथा व्यक्तित्वमा भएका अन्य गुणहरुको आकलन अर्थात परीक्षण र मूल्याङ्कन गर्नको लागि उम्मेदवारहरुलाई कुनै समसामयिक विषय/सवाल/समस्यामा सामूहिक छलफल गरी समस्या समाधान केन्द्रीत प्रभावकारी र कार्यान्वयन योग्य समाधान निकाल्न दिइन्छ।

सामूहिक छलफल

यस प्रयोजनको लागि गरिने परीक्षण १० पूर्णाङ्क र ३० मिनेट अवधिको हुनेछ जुन नेताविहिन सामूहिक छलफलको रुपमा अवलम्वन गरिनेछ। दिइएको प्रश्न वा Topic का विषयमा पालैपालोसँग निर्दिष्ट समयभित्र समूहवीच छलफल गर्दै प्रत्येक उम्मेदवारले व्यक्तिगत प्रस्तुति गर्नुपर्नेछ। यस परीक्षणमा मूल्याङ्कनको लागि देहाय अनुसारको समिति रहनेछ।

आयोगका अध्यक्ष वा अध्यक्षले तोकेको सदस्य	अध्यक्ष
आयोगका सदस्य	सदस्य
मनोविज्ञानवेत्ता	सदस्य
दक्ष/विज्ञ १ जना	सदस्य