



मनमोहन प्राविधिक विश्वविद्यालय

सेवा आयोग

शिक्षण सेवा, भौतिकशास्त्र समूह, छैटा तहको असिस्टेन्ट लेक्चरर पदको खुला
प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

पदको

विवरण

| | |
|-------------------------|---------------------|
| सेवा : शिक्षण | समूह : भौतिकशास्त्र |
| पद : असिस्टेन्ट लेक्चरर | तह : छैटाँ |

पाठ्यक्रमको रूपरेखा

यस पाठ्यक्रमको आधारमा निम्नानुसार दुई चरणमा परीक्षा लिइनेछ: प्रथम चरण : लिखित परीक्षा
पूर्णाङ्क : १५० द्वितीय चरण : (क) कम्प्युटर सीप परीक्षण
पूर्णाङ्क : ३०

(ख) अन्तर्वार्ता

पूर्णाङ्क : २५

तालिका (१)

प्रथम चरण : लिखित परीक्षा

| पत्र | विषय | पूर्णाङ्क | उत्तीर्णाङ्क | परीक्षा प्रणाली | प्रश्न संख्या | समय | |
|---------|---|-----------|--------------|--------------------------------|--|--|---------|
| प्रथम | खण्ड (क) सेवासम्बन्धी कानुनी व्यवस्था | ५० | २० | वस्तुगत बहु वैकल्पिक प्रश्न | २० प्रश्न X १ अङ्क = २० | २० मिनेट | |
| | खण्ड (ख) सेवासम्बन्धी विषय | | | वस्तुगत बहुवैकल्पिक प्रश्न | ३० प्रश्न X १ अंक = ३० | ३० मिनेट | |
| द्वितीय | सेवासम्बन्धी विषय | १०० | ४० | विषयगत प्रश्न | छोटो उत्तर आउने प्रश्न अंक = ६० लामो उत्तर आउने प्रश्न अंक = ४० | १२ प्रश्न X ५ अंक = ६० ४ प्रश्न X १० अंक = ४० | ३ घण्टा |

तालिका (२)

द्वितीय चरण : कम्प्युटर सीप परीक्षण र अन्तर्वार्ता

| विषय | पूर्णाङ्क | परीक्षा प्रणाली | समय |
|-----------------------|-----------|-----------------|----------|
| कम्प्युटर सीप परीक्षण | ३० | प्रयोगात्मक | ३० मिनेट |
| अन्तर्वार्ता | २५ | मौखिक | |

द्रष्टव्य :

१. यो पाठ्यक्रमको योजनालाई प्रथम चरण र द्वितीय चरण गरी दुई भागमा विभाजन गरिएको छ ।
२. माथि उल्लेखित सेवा/समूह, तह र पदको खुला/आन्तरिक प्रतियोगितात्मक परीक्षाको पाठ्यक्रम उपर्युक्तबमोजिम हुनेछ ।
३. लिखित परीक्षाको माध्यम भाषा नेपाली वा अंग्रेजी अथवा नेपाली र अंग्रेजी दुवै हुनेछ ।
४. वस्तुगत बहुवैकल्पिक प्रश्नहरूको गलत उत्तर दिएमा प्रत्येक गलत उत्तरवापत सही उत्तर दिँदा पाउने अंकको २० प्रतिशत अङ्क कट्टा गरिनेछ । तर उत्तर नदिएमा अङ्क कट्टा गरिने छैन ।
५. वस्तुगत बहुउत्तर हुने परीक्षामा परीक्षार्थीले चार वटा उत्तरमध्ये एउटा मात्र उत्तरको नम्बर लेख्नुपर्नेछ ।
६. विषयगत प्रश्नका हकमा तोकिएको अंकका लागि एउटा प्रश्न वा एउटै प्रश्नका दुई वा दुईभन्दा बढी भाग वा दुई वा बढी प्रश्नहरू सोध्न सकिनेछ ।
७. परीक्षामा सोधिने प्रश्नसंख्या, अंक र अङ्कभार सम्बन्धित पत्र /विषयमा दिइएअनुसार हुनेछ ।
८. परीक्षामा परीक्षार्थीले मोबाइल, प्रोग्रामेवल क्यालकुलेटर, स्मार्ट-वाच वा यस्तै प्रकारका विद्युतीय उपकरण परीक्षा हलमा लैजान पाइने छैन ।
९. प्रथम चरणको लिखित परीक्षाबाट छनौट भएका उम्मेदवारहरूलाई मात्र द्वितीय चरणको परीक्षामा सम्मिलित गराइनेछ ।
१०. प्रथम चरणको लिखित परीक्षामा छनौट भएका उम्मेदवारहरूको प्राप्ताङ्क र द्वितीय चरणको प्रयोगात्मक परीक्षा तथा अन्तर्वार्ताको अंकको कूल योगका आधारमा अन्तिम परीक्षाफल प्रकाशित गरिनेछ ।

११. यो पाठ्यक्रम मिति: २०७९/११/१६ देखि लागु हुनेछ । लिखित

परीक्षाका विषयवस्तु

प्रथम पत्र

खण्ड (क): सेवासम्बन्धी कानुनी व्यवस्था (बहुवैकल्पिक प्रश्न)

२०X १ = २०

(क) नेपालको संविधान (भाग १, ३, ५ र अनुसूचीहरू)

(ख) मनमोहन प्राविधिक विश्वविद्यालय ऐन २०७६

(ग) मनमोहन प्राविधिक विश्वविद्यालय शिक्षक तथा कर्मचारीको सेवाका सर्त र सुविधासम्बन्धी नियमावली, २०७८

(घ) मनमोहन प्राविधिक विश्वविद्यालय आर्थिक प्रशासनसम्बन्धी नियमावली, २०७८

(ङ) मनमोहन प्राविधिक विश्वविद्यालय सेवा आयोगसम्बन्धी नियमावली, २०७८

(च) मनमोहन प्राविधिक विश्वविद्यालय संरक्षण समितिसम्बन्धी नियमावली, २०७८

(छ) मनमोहन प्राविधिक विश्वविद्यालय शैक्षिक प्रशासनसम्बन्धी नियमावली, २०७८

(ज) भ्रष्टाचार निवारण ऐन, २०५९ (परिच्छेद-२ : कसूर र सजायसम्बन्धी व्यवस्था)

खण्ड (ख): सेवासम्बन्धी (बहुवैकल्पिक प्रश्न)

३०X १ = ३०

द्वितीयपत्रको सेवासम्बन्धी विषयको पाठ्यक्रम नै पहिलो पत्रको खण्ड “ख” को पाठ्यक्रम हुनेछ ।

Model Question

Multiple choice questions (each question carries 1 marks)

1. The escape velocity of a 10 g body from the earth is 11.2 km/s. Ignoring air resistance, the escape velocity of 10 kg of the iron ball from the earth will be
(a) 11.2 km/s (b) 0.112km/s
(c) 0.0112km/s (d) 0.34 km/s
2. First law of thermodynamics states the conservation of
(a) heat (b) momentum
(c) work (d) energy
3. When a polaroid is rotated, the intensity of light does not vary. The incident light may be
(a) unpolarized (b) completely polarized
(c) partially plane polarized (d) polarized

द्वितीय पत्र : सेवासम्बन्धी विषय

पूर्णाङ्क: १००

1. MECHANICS

25

- 1.1 Measurements and vectors: Accuracy and errors in measurements; Significant figures; Dimensions and uses; Addition of vectors; Resolution of a vector; Vector and scalar products.
- 1.2 Motion in one and two dimensions: Equations of motion; Projectile motion; Motion in circle; Centripetal acceleration; Motion in vertical circle.
- 1.3 Dynamics: Newton's laws of motion; Linear momentum and its conservation; Impulse; Friction; Angular motion, moment of inertia, torque; Angular momentum and its conservation.
- 1.4 Work, Energy and Power: Work done by a force; Kinetic and potential energy; Work-energy theorem; Power.
- 1.5 Gravity and Gravitation: Newton's universal laws of gravitation; Variation of g with altitude, depth and latitude; Satellites; Escape velocity; Black hole.
- 1.6 Periodic motion: Simple harmonic motion; Simple pendulum and mass-spring system; Damped oscillation.
- 1.7 Properties of matter: Hooke's law; Modulus of elasticity; Elastic potential energy; Buoyancy and Archimedes principle; Surface tension, surface energy; Angle of contact, capillarity; Viscosity, Newton's formula, coefficient of viscosity; Stokes law, Bernoulli's equation.

| | | |
|---|---|----|
| 2 | HEAT AND THERMODYNAMICS | |
| | 20 | |
| | 2.1 Thermometry: Heat and temperature; Different scales of temperature and their relations. | |
| | 2.2 Expansion: Expansion of solids; Expansion of liquids; Expansion of gases, gas equations | |
| | 2.3 Quantity of heat: Calorimetry; Heat capacity and specific heat capacity; Newton's law of cooling; Latent heat and specific latent heat. | |
| | 2.4 Thermodynamics: First law of thermodynamics; Isothermal and adiabatic process; Second law of thermodynamics; Heat engines; Entropy. | |
| 3 | OPTICS | 10 |
| | 3.1 Propagation of light and Photometry: Transmission of Light; Shadows; Photometry; Inverse Square Law; Lambert's Cosine Law. | |
| | 3.2 Reflection: Deviation by reflection; Spherical, Concave and Convex, Paraboloidal mirrors. | |
| | 3.3 Refraction: Laws of refraction; Refraction through several media (prism, Lens); Verifications of refraction. | |
| | 3.4 Optical Instruments: Photographic camera; Periscope; Telescope (Galileo, Herschel) | |
| | 3.5 Physical optics: Interference, Young's double slit experiment; Diffraction, diffraction grating; Polarization, Brewster's law. | |
| 4 | SOUND | 5 |
| | Wave Motion and Velocity of Sound: Transverse and Longitudinal Wave Motion; Progressive and stationary waves; Velocity of Sound in Air, Water and Solids; Doppler's effect. | |
| 5 | ELECTROSTATICS AND CURRENT ELECTRICITY | 20 |
| | 5.1 Electric field and Electric potential: Van de Graff Generator, Electrostatic Machine; Coulomb's law; Electric field, Gauss's law; Lines of forces; Electric potential. | |
| | 5.2 Capacitor: Capacity of a capacitor; Condenser in series and parallel; Mica and paper condenser. | |
| | 5.3 Voltaic Cells: Electric Current; Galvanometers; Electrical Measurements; Daniel, Leclanche, Dry and Standard Cells; High and low voltage battery. | |
| | 5.4 Electrical Measurement: Ohm's Law; Kirchoff's Law; Cells in Series and Parallel. | |

| | | |
|----------|---|-----------|
| 5.5 | Chemical and heating Effect of Electric Current: Faraday’s law of electrolysis, verifications, experiments and its applications; Joule’s law of heating, Electric current, verifications and its applications | |
| 5.6 | Magnetic effect of current: Biot-Savart’s law; Magnetic field due to circular coil and solenoid; Ampere’s circuital law. | |
| 5.7 | Electromagnetic induction: Lenz’s Law; Fleming Right Hand Rule; Self and mutual induction; DC Motor, AC Generator; Transformer; AC circuits. | |
| 6 | ATOMIC PHYSICS & ELECTRONICS | 10 |
| 6.1 | Cathode rays, Positive rays, X-rays | |
| 6.2 | Photoelectric effect and photocells | |
| 6.3 | Radioactivity | |
| 6.4 | Nuclear fusion and fission | |
| 6.5 | Bohr’s atom model | |
| 6.6 | Pauli’s Exclusion Principle | |
| 6.7 | Rutherford’s Experiment | |
| 6.8 | Semiconductors | |
| 6.9 | P-N junction diode | |
| 6.10 | Rectifiers | |
| 6.11 | Logic gates | |
| 7 | CURRICULUM OVERVIEW | 10 |
| | Curriculum Overview; Preparation of Teaching Plan, Lesson Plan and Session Plan. | |

प्रयोगात्मक परीक्षा

समय: ३० मिनेट

प्रश्न संख्या: ६

पूर्णाङ्क: ३०

उत्तीर्णाङ्क: १२

कम्प्युटर सीप परीक्षणसम्बन्धी प्रयोगात्मक परीक्षा योजना

| विषयवस्तु शीर्षक | प्रयोगात्मक अंक | समय |
|-----------------------------------|-----------------|----------|
| English Typing | ३ | ४ मिनेट |
| Devanagari Typing | ३ | ४ मिनेट |
| Windows Basic, Email and Internet | ३ | ३ मिनेट |
| Word Processing | ८ | ७ मिनेट |
| Electronics Spreadsheet | ८ | ७ मिनेट |
| Presentation System | ५ | ५ मिनेट |
| Total | ३० | ३० मिनेट |

प्रयोगात्मक परीक्षाका विषयवस्तु

1. Windows basic, Email and Internet

- Introduction to Graphical User Interface
- Use & Update of Antivirus Concept of virus, worm, spam etc.
- Starting and shutting down Windows
- Basic Windows elements - Desktop, Taskbar, My Computer, Recycle Bin etc
- Concept of file, folder, menu, toolbar
- Searching files and folders
- Internet browsing & searching the content in the web
- Creating Email ID, Using email and mail client tools
- Basic Network troubleshooting (checking network & internet connectivity)

2. Word Processing

- Creating, saving and opening documents
- Typing in Devanagari and English
- Copying, Moving, Deleting and Formatting Text
- Paragraph formatting (alignment, indentation, spacing etc.)
- Creating lists with Bullets and Numbering
- Creating and Manipulating Tables

- Borders and Shading
- Creating Newspaper Style Documents Using Column
- Security Techniques of Document
- Inserting header, footer, page number, Graphics, Pictures, Symbols
- Page setting, previewing and printing of documents
- Mail merge

3. Presentation System

- Introduction to presentation application
- Creating, Opening & Saving Slides
- Formatting Slides, Slide design, Inserting header & footer
- Slide Show
- Animation
- Inserting Built-in picture, Picture, Table, Chart, Graphs, and Organization Chart etc

4. Electronic Spreadsheet

- Organization of Electronic Spreadsheet applications (Cells, Rows, Columns, Worksheet, Workbook and Workspace)
- Creating, Opening and Saving Work Book
- Editing, Copying, Moving, Deleting Cell Contents
- Formatting Cells (Font, Border, Pattern, Alignment, Number, Protection, Margins and text wrap)
- Formatting Rows, Column and Sheets
- Using Formula with Relative and Absolute Cell Reference
- Using Basic Functions (IF, SUM, MAX, MIN, AVERAGE etc)
- Sorting and Filtering Data
- Inserting Header and Footer
- Page Setting, Previewing and Printing

Model Question

Short Answer questions (each question carries 5 marks)

1. (a) Differentiate vectors and scalars. (2)
(b) A car travels up a hill at a constant speed of 40 km/h and returns down the hill at a constant speed of 60 km/h. Calculate the average speed for the round trip. (3)
2. (a) At what temperature is the Fahrenheit scale reading equal to twice that of the Celsius? (3)
(b) Materials A, B, and C are solids that are at their melting temperatures. Material A requires 200 J to melt 4 kg. Material B requires 300 J to melt 5 kg. And material C requires 300 J to melt 6 kg. Rank the materials according to their heats of fusion, greatest first. (2)
3. What is elasticity ? Explain the behavior of a wire when it is subjected to increasing load. (1+4)

Long Answer questions (each question carries 10 marks)

1. (a) Define linear momentum and state the principle of conservation of linear momentum. Explain how the principle conservation of momentum follows Newton's laws of motion. (1+1+4)
(b) Sand is deposited at a uniform rate of 20 kilograms per second and with negligible kinetic energy on to an empty conveyer belt moving horizontally at a constant speed of 10 meters per minute. Find the force and power required to maintain constant velocity. (2+2)
2. State Newton's law of gravitation. Discuss the variation of the acceleration due to gravity g with height and depth from the earth's surface. Explain graphically how an object's weight changes as it moves from the surface of the earth to the moon. (2+4+4)

☆☆☆