लोक सेवा आयोग

नेपाल इञ्जिनियरिङ्ग सेवा, मेटेरियोलोजी समूह, राजपत्राङ्कित तृतीय श्रेणीका पदको खुला प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

द्वितीय पत्र (Paper II): Technical Subject

Section A - 30 Marks

1. **Physical Meteorology**
   - 1.1 Introduction of the atmosphere
     - 1.1.1 Characteristics of the atmosphere
     - 1.1.2 Composition of the atmosphere
   - 1.2 Radiation
   - 1.2.1 Energy sources and radiation principles
   - 1.2.2 Solar radiation
   - 1.2.3 Albedo
   - 1.2.4 Absorption of terrestrial radiation
   - 1.2.5 The effect of the line structure of the water vapour spectrum on the atmospheric emission and absorption
   - 1.2.6 Nocturnal radiation and the cooling of the surface layers
   - 1.3 Principles of thermodynamics
     - 1.3.1 Work, heat
     - 1.3.2 The law of conservation of energy
     - 1.3.3 Internal energy and heat capacities of an ideal gas
     - 1.3.4 Adiabatic processes
     - 1.3.5 Entropy and second law of thermodynamics
     - 1.3.6 Summary of thermodynamic variables
   - 1.4 Hydrostatic equilibrium
     - 1.4.1 The hydrostatic equation
     - 1.4.2 Height computation of upper air sounding
     - 1.4.3 The hydrostatics of special atmosphere
     - 1.4.5 Altimetry
     - 1.4.6 Reduction of pressure to sea level
   - 1.5 Hydrostatic stability
     - 1.5.1 Stability criteria
     - 1.5.2 Absolute stability
     - 1.5.3 Absolute instability
     - 1.5.4 Conditional instability
     - 1.5.5 Parcel method
     - 1.5.6 Slice method
     - 1.5.7 Entrainment theory

2. **Synoptic Meteorology**
   - 2.1 Air mass and front
   - 2.2 Definition of air mass, source region
     - 2.2.1 Classification and its symbols
     - 2.2.2 Modification of air mass
     - 2.2.3 General characteristics, classification of fronts
     - 2.2.4 Weather associated with idealized fronts
     - 2.2.5 Frontogenesis and frontolysis
   - 2.3 Extra-tropical cyclone
   - 2.4 Thunderstorms and tornadoes
   - 2.5 Weather analysis and forecasting
     - 2.5.1 Concept of synoptic analysis
     - 2.5.2 Preparation of synoptic charts

2.5.3 Isobars on a level surface and contours of the isobaric surfaces and thickness of isobaric layers
2.5.4 Synoptic representation of the pressure field
2.6 Meteorological codes and symbols
2.6.1 SYNOP, TEMP
2.6.2 Meteorological symbols

Section B -20 Marks

3. **Dynamic Meteorology**
3.1 Coordinate system
3.2 Inertial versus non-inertial coordinate system
3.3 Dynamical equation in rotation coordinate system
3.4 Concept of gravity and gravitation
3.5 The pressure gradient force
3.6 Inertia motion
3.7 Individual versus local and convective derivatives
3.8 Equation of continuity
3.9 Complete set of equations governing the atmosphere
3.10 Horizontal motion under balanced forces
3.10.1 Geostrophic flow
3.10.2 Gradient flow
3.10.3 Cyclostrophic flow
3.10.4 The thermal wind
3.11 Mechanism and influence of pressure changes
3.11.1 Pressure tendency equation
3.11.2 The Bjerkenes-Holmboe theory
3.11.3 The isallobaric wind
3.12 Circulation and vorticity
3.12.1 The circulation theorem; Physical interpretation and application
3.12.2 Vorticity theorem
3.12.3 Divergence
3.13 Numerical weather prediction
3.13.1 Fundamentals of NWP
3.14 General Circulation of the Atmosphere
3.14.1 The mean circulation in the troposphere and lower stratosphere
3.14.2 Meridional circulation
3.14.3 Model of general circulation

Section C -20 Marks

4. **Tropical Meteorology**
4.1 The scope of tropical meteorology
4.2 The equatorial trough
4.3 Mean sea level circulation
4.4 The trade winds
4.5 Weather in tropics
4.6 Inter tropical convergence zone
4.7 Tropical disturbances and cyclones
4.7.1 Classification and definition of tropical disturbances
4.7.2 Global climatology of tropical cyclones
4.7.3 Tropical storms, their formation, movement and forecasting

4.8 Monsoon
- 4.8.1 Global monsoons
- 4.8.2 Differential heating
- 4.8.3 Heat low
- 4.8.4 Monsoon depressions
- 4.8.5 Monsoon climatology

4.9 Waves in the easterlies

4.10 El Nino, La Nina, Southern Oscillation

5. Climatology

5.1 Definition and scope of climatology

5.2 Solar radiation and terrestrial heat balance

5.3 Spatial and temporal variation of temperature

5.4 Spatial and temporal variation of winds and pressure

5.5 Climatic classification and description of climatic classification

5.6 Climates of Nepal

5.7 Climate change and its impact

5.8 Statistics in climatology

Section D -30 Marks

6. **Applied Meteorology**

6.1 Air pollution, pollutants and its dispersion

6.2 Agriculture meteorology
- 6.2.1 General physiology of plant growth
- 6.2.2 Role of soil and atmosphere

6.3 Weather and climate in relation to the plant growth and development of vegetation
- 6.3.1 Photosynthesis
- 6.3.2 Soil temperature
- 6.3.3 Wind profile near ground
- 6.3.4 Lysimeters
- 6.3.5 Frost and frost protection

6.4 Aviation meteorology
- 6.4.1 Visibility
- 6.4.2 Fog
- 6.4.3 Turbulence
- 6.4.4 Jet stream
- 6.4.5 Aircraft icing
- 6.4.6 Altimeter setting
- 6.4.7 Route forecast
- 6.4.8 Clouds
- 6.4.9 Meteorological Aviation Report (METAR), Terminal Aerodrom Forecast (TAF)

7. **Instrumentation and method of observation**

7.1 Precipitation

7.2 Surface wind

7.3 Pressure

7.4 Temperature

7.5 Humidity

7.6 Sunshine and Radiation
7.7 Evaporation
7.8 Upper air observation

8. Hydrometeorology

8.1 Hydrologic cycle and application of hydrology
8.2 Precipitation
8.3 Infiltration
8.4 Evapotranspiration
8.5 Runoff
8.6 Hydrographs
8.7 Ground water
8.8 Water balance

9. **Satellite and radar Meteorology**

9.1 Introduction
9.2 Satellite Sensors
9.3 Image Interpretation
9.4 Quantitative Information from Satellites
9.5 Fundamentals of Radar
9.6 Bright Bands

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नेपाल इञ्जिनियरिङ्ग सेवा, मेटेरियोलोजी समूह, राजपत्राङ्कित तृतीय श्रेणीका पदको खुला प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

प्रथम चरणको लिखित परीक्षाबाट छनौट भएका उम्मेदवारहरुलाई मात्र

लिइने **सामूहिक परीक्षण (Group Test)** को लागि

सामूहिक छलफल (Group Discussion)

यस प्रयोजनको लागि गरिने परीक्षण १० पूर्णाङ्क र ३० मिनेट अवधिको हुनेछ जुन नेतारविहिन सामूहिक छलफल (Leaderless Group Discussion) को रुपमा अवलम्वन गरिने छ । दिइएको प्रश्न वा Topic का विषयमा पालैपालोसँग निर्दिष्ट समयभित्र समूहवीच छलफल गर्दै प्रत्येक उम्मेदवारले व्यक्तिगत प्रस्तुति (Individual Presentation) गर्नु पर्नेछ । यस परीक्षणमा मूल्याङ्कनको लागि देहाय अनुसारको ३ जनाको समिति रहनेछ ।

आयोगका अध्यक्ष वा सदस्य	-	अध्यक्ष
मनोविज्ञ	-	सदस्य
दक्ष/विज्ञ (१ जना)	-	सदस्य

सामूहिक छलफलमा दिइने नमुना प्रश्न वा Topic

उदाहरणको लागि - उर्जा संकट, गरीबी निवारण, स्वास्थ्य बीमा, खाद्य सुरक्षा, प्रतिभा पलायन जस्ता Topics मध्ये कुनै एक Topic मात्र दिइनेछ ।