

2025

M.Sc. 3rd Semester Examination
GEOGRAPHY

Paper : GEO - 306-A/C/D/E/F

Full Marks : 25

Time : One Hour

*The figures in the margin indicate full marks.
Candidates are required to give their answers
in their own words as far as practicable.*

Spl. Paper : Advanced Geomorphology

GEO - 306A

(Process Geomorphology-1)

Group - A

Answer any *two* questions : $2 \times 2 = 4$

1. What is meant by imposed boundary condition?
2. How does the size of an alluvial fan depend on catchment area?
3. Define hyperpycnal flow.
4. Define sub-critical flow.

Group - B

Answer any *two* questions : $4 \times 2 = 8$

5. Illustrate the concept of geomorphic threshold with suitable examples.

P.T.O.

(2)

6. How does process-form relationship along a channel change from source to mouth?
7. How do erosion, transportation and deposition of sediment in the open channel depend on velocity and grain size?
8. How does a river respond to urbanisation?

Group - C

Answer any *one* question :

8×1=8

9. Explain the theories of floodplain formation with suitable diagrams.
10. Illustrate the forces applied on a submerged particle to initiate entrainment.

Internal Assessment : 5 marks

(3)

**Spl. Paper : Urban Geography and Regional
Planning**

GEO - 306C

(Foundation of Urban Geography)

Group - A

Answer any *two* questions : $2 \times 2 = 4$

1. Define 'Urban Agglomeration' according to the Census of India 2011.
2. Make a comparison between suburbanisation and ex-urbanisation.
3. Write a short note on 'Ecumenopolis'.
4. Mention the role of 'green cities' in sustainable development.

Group - B

Answer any *two* questions : $4 \times 2 = 8$

5. Explain the different dimensions of Urban Livability Index.
6. Account for the National Urban System and its role in regional development planning.
7. Discuss the key characteristics of urbanism as described by the Chicago School.
8. Define gentrification and critically explain its social and economic impacts in Indian cities.

P.T.O.

(4)

Group - C

Answer any *one* question :

8×1=8

9. Elucidate the key features and development challenges of metropolitan regions.
10. Describe the major propositions of Le Corbusier's planning vision and explain their relevance to present-day urban planning.

Internal Assessment : 5 marks

(5)

GEO- 306D

(Physical Basis of Remote Sensing)

Group - A

Answer any *two* questions : $2 \times 2 = 4$

1. What is the difference between molecular and particulate matter scattering?
2. What is energy flux density?
3. What is a photoelectric effect?
4. What is electromagnetic radiation (EMR)?

Group - B

Answer any *two* questions : $4 \times 2 = 8$

5. Discuss the implications of refractive index correction in remote sensing.
6. Write the theoretical basics of Dark Object Subtraction for atmospheric correction.
7. Explain how the atmosphere affects remote sensing signals through atmospheric scattering and discuss the three main types of scattering that influence electromagnetic radiation.
8. Two materials have the same kinetic temperature (310 K) but emissivity of 0.9 and 0.7. Calculate and compare their radiant temperatures.

P.T.O.

(6)

Group - C

Answer any *one* question : $8 \times 1 = 8$

9. Describe the internal and external source referencing of a thermal imaging system.
10. State Kepler's third law. Two satellites, Satellite A and Satellite B, are orbiting the Earth in circular orbits. Satellite A has a semi-major axis of 7,000 km, and Satellite B has a semi-major axis of 14,000 km. Using Kepler's third law, calculate the orbital period of Satellite B if the orbital period of Satellite A is 1.5 hours.

Internal Assessment : 5 marks

(7)

GEO - 306E

(Theories in Landscape Ecology)

Group - A

Answer any *two* questions : $2 \times 2 = 4$

1. Explain the interdisciplinary nature of landscape ecology.
2. Define Holon.
3. How do pattern and process relate in landscape ecology?
4. What is meant by β -biodiversity?

Group - B

Answer any *two* questions : $4 \times 2 = 8$

5. Briefly discuss the gradient concept of landscape structure.
6. Explain the importance of temporal and spatial scale in landscape ecological analysis.
7. Describe with examples how hierarchy theory helps in understanding landscape organization.
8. What are the facets of habitat ecology in a landscape?

Group - C

Answer any *one* question : $8 \times 1 = 8$

9. Discuss the applications of landscape ecology in forest lands and wildlife corridors.

P.T.O.

(8)

10. Structure and process are an integral part of landscape analysis — Explain it.

Internal Assessment : 5 marks

(9)

GEO - 306F

(Climate System)

Group - A

Answer any *two* questions : $2 \times 2 = 4$

1. Define Bowen ratio.
2. What is meant by feedback in global energy balance model?
3. What is aerosol radiative forcing?
4. What is saturation vapour pressure?

Group - B

Answer any *two* questions : $4 \times 2 = 8$

5. Specify the role of man in the climate system.
6. Write, in brief, the theoretical basics of atmospheric optical depth.
7. Give an account of aerosol's direct and indirect effects on weather and climate.
8. Write an account of the theoretical basics of developing a cloud droplet with a critical radius.

Group - C

Answer any *one* question : $8 \times 1 = 8$

9. Illustrate the theoretical basics of the radiative transfer model through the atmosphere.

P.T.O.

(10)

10. Describe the role of land surface in forcing the climate system.

Internal Assessment : 5 marks
