

2023

M.A. / M.Sc.

4th Semester Examination

GEOGRAPHY

PAPER : GEO-404A/B/C/D

Full Marks : 50

Time : 2 hours

The figures in the right-hand margin indicate marks.

*Candidates are required to give their answers
in their own words as far as practicable.*

Illustrate the answers wherever necessary.

(404A.1)

(Marks : 20)

(ADVANCED GEOMORPHIC TECHNIQUES)

Answer from **all** the Groups as directed.

GROUP—A

Answer *any two* questions from the following :

2×2=4

1. What is wetted perimeter?

(2)

2. Define boundary resistance.
3. Define entrainment threshold.
4. What is watershed?

GROUP—B

Answer *any two* questions from the following :

4×2=8

5. Write the properties of bed load of a natural channel.
6. Assess the importance of different types of models in geomorphology.
7. Evaluate the geomorphic significance of Manning's Equation.
8. How do you estimate stream energy?

GROUP—C

Answer *any one* question from the following :

8×1=8

9. Critically evaluate the necessity and possible impacts of large dams removals with special emphasis on the problems of sedimentation.
10. Illustrate the theoretical and empirical methods of estimating stream velocity.

(3)
(404A.2)
(Marks : 20)

(APPLIED GEOMORPHOLOGY)

Answer from **all** the Groups as directed.

GROUP—A

Answer *any two* questions from the following :

2×2=4

1. What is the significance of EMP?
2. How does soil piping play a role in the collapsing process?
3. Why is a river basin considered a geomorphic unit?
4. How far does geomorphology influence sewage treatment in urban management?

GROUP—B

Answer *any two* questions from the following :

4×2=8

5. Explain the role of geomorphological knowledge in estimating the water budget within the river basin.

(4)

6. How far can the application of geomorphology help to manage the bank erosion hazard?
7. Discuss the application of geomorphology in EIA.
8. Enumerate the role of geomorphology in storm water management in urban areas.

GROUP—C

Answer *any one* question from the following :

8×1=8

9. Critically discuss the geomorphological significance of dam site selection at Farakka across the river Ganga and its impact.
10. Examine the geomorphological reasons and possible management options for the coastal erosion hazard in Old Digha.

[Internal Assessment : 10 Marks]

(5)

(404B.1)

(Marks : 20)

(**COASTAL ECOLOGY AND HAZARDS**)

Answer from **all** the Groups as directed.

GROUP—A

Answer *any two* questions from the following :

2×2=4

1. Why is productivity of kelp community positively related to wave turbulence?
2. Define "greenhouse state".
3. Why is rate of terrestrial erosion high in the phase of falling sea level?
4. Why does sea level rise?

GROUP—B

Answer *any two* questions from the following :

4×2=8

5. Explain the procedure of estimating coastal erosion resulting from sea level rise.
6. Describe the adaptation techniques of dune vegetation.
7. Assess the impacts of the recent storm hazards on West Bengal coast.
8. How do you monitor sea wave?

(6)
GROUP—C

Answer *any one* question from the following :

8×1=8

9. Elucidate the mechanism of long-term and short-term sea level change.
10. Examine the physical and ecological roles of sea weeds.

(404B.2)

(Marks : 20)

(**COASTAL ISSUES AND MANAGEMENT**)

Answer from **all** the Groups as directed.

GROUP—A

Answer *any one* question from the following :

8×1=8

1. Critically examine the applications of remote sensing and GIS techniques in coastal management, mentioning geomorphological microzones and environmental zoning approaches.
2. Justify the significance of coastal vulnerability assessment and ecosystem valuation in managing coastal changes.

(7)

GROUP--B

Answer *any two* questions from the following :

4×2=8

3. Discuss the methods of coastal habitat restoration in Mangrove wetlands.
4. Explain how the environmental regulations are violated by the coastal tourism with special reference to the Mandarmani Coast.
5. Enumerate the role of soft structure design in managing coastal change.
6. Mention briefly the impacts of coastal urbanization on the vulnerability of sea level rise.

GROUP--C

Answer *any two* questions from the following :

2×2=4

7. How does coastal eutrophication take place in a lagoon?
8. What is the concept of ICZM?
9. Why is coastal resource management needed?
10. Identify the method of estimating population pressures along the coast.

[Internal Assessment : 10 Marks]

(8)

(404C.1)

(Marks : 20)

(THEORETICAL BASES OF REGIONAL
PLANNING)

Answer from **all** the Groups as directed.

GROUP—A

Answer *any two* questions from the following :

2×2=4

1. What do you understand by the metaphor 'planning from below'?
2. What is the 'backwash effect'?
3. What is meant by 'Pareto Optimality'?
4. How has the colonial past created regional disparities in India?

GROUP—B

Answer *any two* questions from the following :

4×2=8

5. Discuss the contribution of Friedmann in developing the Core-Periphery model.
6. What are the basic tenets of the theory of 'Development of Underdevelopment' after Andre Gunder Frank?
7. Describe in brief the major environmental problems in coastal regions of Purba Medinipur.

(9)

8. Bring out the differences between balanced growth and unbalanced growth.

GROUP—C

Answer *any one* question from the following :

8×1=8

9. Critically analyze the Growth Pole theory as proposed by Perroux.
10. Explain the territorial strategies of the agropolitan approach as a viable tool for poor empowerment.

(404C.2)

(Marks : 20)

(PLANNING FOR URBAN DEVELOPMENT)

Answer from **all** the Groups as directed.

GROUP—A

Answer *any two* questions from the following :

2×2=4

1. What is the role of mass transportation in urban planning?
2. What are the basic features of an under-developed economy?
3. Distinguish between basic and non-basic functions in the urban economy.

(10)

4. Write a short note on stakeholders of the real-state sector.

GROUP—B

Answer *any two* questions from the following :

4×2=8

5. Discuss the basic principles of urban planning in India.
6. What is the critical role of the Government in promoting urban sanitation in India?
7. Discuss the significance of wetlands for urban waste water treatment with examples.
8. Evaluate the factors determining the valuation of land in urban areas.

GROUP—C

Answer *any one* question from the following :

8×1=8

9. What are the policies and programs that have been implemented to address urban housing issues in the post reforms period in India?
10. How can RS and GIS technologies be applied to improve urban land-use planning and management?

[Internal Assessment : 10 Marks]

(11)

(404D.1)

(Marks : 20)

(**ADVANCED REMOTE SENSING**)

Answer from **all** the Groups as directed.

GROUP—A

Answer *any two* questions from the following :

2×2=4

1. What is spatial filtering?
2. Write a short note on the applications of Lidar.
3. What do you mean by Signal-to-Noise Ratio (SNR)?
4. What is cross-polarisation in SAR images?

GROUP—B

Answer *any two* questions from the following :

4×2=8

5. How do remote sensing applications contribute to the advancement of climate change science?
6. Discuss the advantages of hyperspectral remote sensing over traditional remote sensing techniques for resource exploration.
7. How do you overcome the atmospheric interferences affecting optical images?

(12)

8. Explain the process of image normalization in satellite image transformation.

GROUP—C

Answer *any one* question from the following :

8×1=8

9. Compare between range resolution and azimuth resolution in radar imaging. How do these contribute in spatial resolution of a radar image?
10. Describe the concept of image enhancement in digital image processing. Discuss different techniques used for contrast enhancement, noise reduction and image sharpening.

(404D.2)

(Marks : 20)

**(ADVANCED GIS AND APPLICATION OF
REMOTE SENSING)**

Answer from **all** the Groups as directed.

GROUP—A

Answer *any two* questions from the following :

2×2=4

1. What is spatial autocorrelation?

2. What is a radial basis function?
3. Write two applications of drone-based imaging.
4. What is spectral shifting in vegetation study using remote sensing?

GROUP—B

Answer *any two* questions from the following :

4×2=8

5. Describe how slope and aspect are derived from digital elevation data.
6. From the following data matrix, which contains the information of land cover classes, compute the compositional index using 3×3 kernel window. (The values in the cells are land cover classes)

1	1	2	2	1
1	1	2	2	2
2	1	2	3	2
4	4	2	2	3
4	3	4	2	1

7. Write a short note on the application of remote sensing in vegetation study.

(14)

8. Briefly describe the estimation of suspended load from remotely sensed image.

GROUP—C

Answer *any one* question from the following :

8×1=8

9. What is spatial interpolation? Describe any one spatial interpolation methods with suitable graphics.
10. Describe the process of estimation of land surface temperature from Landsat 8 image.

[Internal Assessment : 10 Marks]
