

West Bengal State University
M.A/ M.Sc. Second Semester Examination, 2024
Department of Geography
GEOPCOR06T: HYDROLOGY AND OCEANOGRAPHY

Full marks: 50

Time: 2 hours

Answer four questions, selecting one from each unit.**Unit 1: Components of Hydrology**

- 1 What are the factors affecting interception loss? How do you estimate it? Discuss the principles of hydrologic budget calculation. 3+3+4=10
- 2 What is Intensity-Duration-Frequency (IDF) curve? An irrigation canal is 80 km long. It has an average surface width of 15 m. The evaporation measured in a class A Pan is 5mm/day. Calculate the volume of water evaporated in a month of 30 days (take Pan coefficient as 0.7). What is the difference between PET and AET? 3+4+3=10

Unit 2: Surface and Groundwater Hydrology and Related Applications

- 3 Discuss the basin characteristics affecting runoff. Describe the distribution of subsurface occurrence of groundwater. 5+5=10
- 4 Assess the significance of rainwater harvesting (RWH) in the present context. What are the controlling factors for the adaptation of RWH technology by Indian farmers? 6+4=10

Unit 3: Morphology of Ocean Basin

- 5 Describe the characteristics of the Californian Type continental margin with reference to their tectonic settings. How do contour currents form in deep sea plain? 7+3=10
- 6 Explain the role of zooxanthellae in sustaining coral reefs. Differentiate between barrier reef and fringing reef on the basis of their evolution. 5+7=10

Unit 4: Ocean Circulation and Marine Resources

- 7 Explain with examples the earth-atmosphere relation in terms of positive and negative feedback mechanisms. Briefly describe Langmuir's Circulation with suitable diagram. 7+3=10
- 8 As per the United Nations Convention on Law of the Sea (UNCLOS), elucidate the rights and duties of the coastal state with respect to its EEZ. How is territorial water defined? 8+2=10

Internal assessment = 10

$$2+6+4+7+6=25 \checkmark$$

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GEOPCOR06T: HYDROLOGY AND OCEANOGRAPHY

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Answer four questions, selecting one from each unit.

Unit 1: Components of Hydrology

1. Classify hydrological system models. Elaborate your ideas about distributed, semi-distributed, and lumped models with example. 4+6=10
2. Mention the controls of evaporation. Describe the equipments and methods of measuring evaporation and evapotranspiration. 4+6=10

Unit 2: Surface and Groundwater Hydrology and Related Applications

3. What is basin lag? Discuss the procedures of water harvesting in urban tropics. 2+8=10
4. Explain Darcy's Law mentioning its significance in groundwater movement. Distinguish between porosity and permeability. 7+3=10

Unit 3: Morphology of Ocean Basin

5. Elucidate the role of turbidity current in the formation of submarine canyons. Explain the formation of Red Clay in the deep ocean floor. 5+5=10
6. Explain the morphology of the Indian Ocean floor with special reference to the oceanic ridge system and islands. Comment on the formation of the Sunda Arc. 7+3=10

Unit 4: Ocean Circulation and Marine Resources

7. What are the major solutes in seawater? Discuss the principal controlling factors of salinity and temperature of ocean water masses. 4+6=10
8. How is the CRZ delineated along rivers, tidal creeks and backwaters? Describe the characteristics of CRZ I, II, III and IV as per the 2011 amendment. 2+8=10

Internal assessment = 10

West Bengal State University
M.A/ M.Sc. Second Semester Examination, 2022
Department of Geography
GEOPCOR06T: HYDROLOGY AND OCEANOGRAPHY

Full marks: 50

Time: 2 hours

Answer four questions, selecting one from each unit.

Unit 1: Components of Hydrology

- 1 Distinguish between primary and secondary throughfall. How is rainwater distributed among various storages? 4+6=10
- 2 Describe the various components of hydrological budget. Discuss the salient features of the Sacramento Model 6+4=10

Unit 2: Surface and Groundwater Hydrology and Related Applications

- 3 How can the baseflow be separated from total runoff? Explain the flow of groundwater. 5+5=10
- 4 What should be the ideal approach towards managing water resources for tropical farmlands? Explain the importance of the zone of aeration. 8+2=10

Unit 3: Morphology of Ocean Basin

- 5 Describe any four major processes of transport and deposition of ocean sediment in the continental slopes and ocean basins. =10
- 6 Explain with suitable sketches the morphodynamic models of reef formation. What are Zooxanthellae? 7+3=10

Unit 4: Ocean Circulation and Marine Resources

- 7 Describe the mechanism of development of a rotational tidal system. What is a tidal bore? 8+2=10
- 8 Discuss the changes in wave characteristics as they move from deep to shallow water condition. How is Ekman's Spiral formed? 6+4=10

Internal assessment = 10

West Bengal State University
M.A/ M.Sc. Second Semester Examination, 2021
Department of Geography
GEOPCOR06T: HYDROLOGY AND OCEANOGRAPHY

Full marks: 50

Time: 2 hours

Answer four questions, selecting one from each unit.

Unit 1: Components of Hydrology

- 1 Discuss HBV model as a hydrological system model. Distinguish between lumped model and distributed model with example. 6+4=10
- 2 What are the controlling factors of evapotranspiration? How can we measure it? 6+4= 10

Unit 2: Surface and Groundwater Hydrology and Related Applications

- 3 Discuss the characteristics of the zones developed in the vertical distribution of groundwater. Explain capillary rise of water with diagram and equation. 6+4=10
- 4 How is direct runoff generated? How do you separate baseflow from direct runoff? Define basin-lag. 4+4+2=10

Unit 3: Morphology of Ocean Basin

- 5 Compare with illustrations characteristics of Mid-Oceanic Ridges on the basis of their rate of spreading. How are guyots related with spreading margins? 7+3=10
- 6 Describe the tectonic evolution of Indian Ocean as reconstructed from the evidences of plate motion. Support your answer with diagrams. 5+5=10

Unit 4: Ocean Circulation and Marine Resources

- 7 Explain atmosphere-ocean linkage in terms of Global Carbon Cycle. Briefly discuss the effect of rain on the ocean surface. 7+3=10
- 8 What is the procedure of delimitation of EEZ according to the United Nations Convention on Law of the Sea (UNCLOS)? What are the right and duties of the coastal countries in the EEZ? 6+4=10

Internal assessment = 10

West Bengal State University
M.A/ M.Sc. Second Semester Examination, 2020
Department of Geography

GEOPCOR06T: HYDROLOGY AND OCEANOGRAPHY

Full marks: 25

Time: 2 hours

Answer any one question from the following (within 600 words)

1 × 10 = 10

1. How do you classify Hydrological modelling? Give examples with your answer.
2. Mentioning its importance, explain the concept of Darcy's Law.
3. Discuss the different morphodynamic models of formation of fringing reefs. Support your answer with suitable diagrams.
4. Describe the mechanism of development of a rotational rotating tidal system. Support your answer with the tidal circulation in the Atlantic Ocean.

Answer any three questions from the following (within 300 words)

3 × 5 = 15

5. How do you estimate evaporation?
6. What do you mean by runoff and through flow?
7. How can we harvest water?
8. Explain with diagram the stratigraphic sequence of turbidite deposits
9. Describe with diagram the characteristics of the Californian Type continental margin.
10. Briefly discuss the mechanism of gas exchange as an example of ocean-atmosphere linkage.