

[ 2 ]

4. Define hydraulic conductivity. Deduce the relationship between Darcy's velocity and hydraulic gradient with the help of a neat diagram. Find out Darcy's velocity if hydraulic gradient equals with tangent of 45 degree and hydraulic conductivity is 4 cm/day. 3+4+3

### Unit – III

#### Physical Oceanography

5. Explain the occurrence and types of hydrothermal vents on ocean floors. What type of breaker will a wave of 1/6 deep-water steepness form on a beach having a slope of 30°? What are the factors that control the velocity and amplitude of tsunamis? What is a meteotsunami? 3+2+4+1
6. Why does Bay of Fundy have the highest tidal range in the world? What is proxigean tide? Elucidate the factors responsible for eustatic sea level changes. Name one subduction zone where active back-arc basin is observed. 3+2+4+1

### Unit – IV

#### Dynamic Oceanography

7. Discuss the characteristics of the two broad categories of oceanic circulation. What is an oceanic eddy? 8+2
8. Define "air-sea gas flux". Discuss how we can measure air-sea CO<sub>2</sub> flux using the bulk formula method. 2+8
9. Internal Assessment 10

Ex/PG/Sc/CORE/GEOG/TH/C102T/2023

## MASTER OF SCIENCE EXAMINATION, 2023

(1st Year, 1st Semester)

### GEOGRAPHY

#### PAPER – GEOG C102T

#### [ HYDROLOGY AND OCEANOGRAPHY ]

Time : Two Hours

Full Marks : 50

Answer *one* question from each unit.

### Unit – I

#### Hydrological Systems

1. Enumerate the factors affecting evapotranspiration. Explain the role of porosity and permeability in aquifer formation. Differentiate between river basin and watershed 5+3+2
2. Discuss the different lithological formations with respect to groundwater flow and storage. Explain the difference of saltwater – freshwater dynamics in the Sundarbans and Digha-Mandarmani area of West Bengal. 5+5

### Unit – II

#### Models and Theories in Hydrology

3. Discuss the factors affecting streamflow-flood relationship in a river basin. What is meant by discharge in an open channel? 8+2

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