UPES
End Semester Examination, December 2024

Course: Engineering Geology and Groundwater   Semester: III
Program: B.Tech. Civil Engineering   Time: 03 hrs.
Course Code: CIVL2029   Max. Marks: 100

Instructions: <u>Assume suitable values for any missing.</u>

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1.	Explain the concept of zone of rock fracture and zone of rock flowage in groundwater.	04	CO3
Q 2.	Define the following: i. Tenacity ii. Throw iii. Heave iv. Rake	04	CO1
Q 3.	What do you understand by erosion and state the factors affecting transportation of sediments?	04	CO1
Q 4.	Discuss the various forces responsible for landform development.	04	CO1
Q 5.	State the various structural components of a dam with a neat sketch.	04	CO4

SECTION B
(4Qx10M= 40 Marks)

Q 6.	Describe the different geological investigations involved in dam construction.	10	CO4
Q 7.	Explain the procedure for locating the epicenter of an earthquake from seismograph stations. OR Examine the reason for frequent tectonic plate disturbances in Mid-Oceanic-Ridge.	10	CO3
Q 8.	Discuss the various types of faults on the basis of attitude and apparent movement of fault with their salient points.	10	CO2
Q 9.	Explain the artesian, non-artesian and perched aquifers along with their critical points and neat sketches.	10	CO3

	SECTION-C (2Qx20M=40 Marks)		
Q 10.	Explain the various types of seismic waves along with their critical points. Also, examine how do they differ in terms of their movement and impact on the Earth's surface?	20	CO3
Q 11.	a. A bed of soil consists of four horizontal layers of equal thickness having coefficient of permeability as 2×10^{-5} mm/s, 3×10^{-5} mm/s, 4×10^{-5} mm/s, and 5×10^{-5}, respectively. Calculate the ratio of average permeability in x and y direction and determine the equivalent permeability. b. Explain the concept of permeability and porosity, and their relevance in groundwater. OR a. A time of 5 hours was required for a tracer to travel through an aquifer from one well to another in a field test. The observation wells were 45m apart and RLs of the wells were found to be 104.62 m and 104.20 m. The porosity of the soil medium is 35% and kinematic viscosity of water may be taken 0.03 cm^2/sec. Estimate the discharge velocity in the aquifer. Also, calculate the hydraulic conductivity and intrinsic permeability of the aquifer. b. State the important factors responsible for groundwater flow. Explain the standard process for the measurement/determination of groundwater flow/velocity.	13+07	CO4