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B.Tech. (CE) (2011 Onwards E-I & II) (Sem.-7,8)

HYDROLOGY AND DAMS

Subject Code : BTCE-817

Paper ID : [A2971]

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

Q1. Answer briefly :

- a) What is an Isohyets?
- b) What are the various methods adopted to convert the point rainfall values into an average value over a catchment?
- c) What is Transpiration?
- d) What do you understand by AET and PET.?
- e) What are infiltration indices?
- f) What is a synthetic unit hydrograph and what is its use?
- g) What are the various forces acting on arch dams?
- h) Give the advantages of massive head buttress dams.
- i) What are the various forces acting on gravity dams?
- j) What are the cases for which design of gravity dam is to be checked?

SECTION-B

Q2. Describe the salient characteristics of precipitation on India.

Q3. Ordinates of DRH are given below :

Time (h)	0	6	12	18	24	30	36	42	48	54	60
DRH (m³/s)	0	48	130	195	162	108	65	39	27	12	0
Avg. cumulative rainfall (cm)	0	3.7	10.4	18.3	18.3						

Compute the rate of infiltration for the basin. Take the catchment area of the basin as 200 km².

Q4. Given the ordinates of 4-h unit hydrograph below derive the ordinates of 12-h unit hydrograph for the same catchment

Time (h)	0	4	8	12	16	20	24	28	32	36	40	44
Ordinate of 4-h UH	0	20	80	130	150	130	90	52	27	15	5	0

Q5. What are the various modes of failure of gravity dams?

Q6. What is meant by '*the best central angle of an arch dam*' and how will you determine its value?

SECTION-C

Q7. A one day rainfall of 15cm at a place X was found to have a return period of 100 years. Calculate the probability that a one day rainfall of this or larger magnitude :

- Will not occur at X during the next 50 years
- Will occur in the next year?

Q8. What is meant by elementary profile of a gravity dam and how is it deduced? What should be the maximum depth of the elementary profile of a dam if the safe limit of stress on the masonry should not exceed 150 tonnes per m²?

Q9. Enumerate different types of buttress dams along with neat sketches.