

Paper Id: **100750**Roll No:

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B. TECH.
(SEM-VII) THEORY EXAMINATION 2019-20
WATER RESOURCES

Time: 3 Hours**Total Marks: 70****Note: 1. Attempt all Sections. If require any missing data; then choose suitably.****SECTION A****1. Attempt all questions in brief.****2 x 7 = 14**

- a. Find the delta for a crop if the duty for a base period of 110 days is 1400 hectares/cumec.
- b. Write advantages of Furrow Irrigation.
- c. Define Berms.
- d. The recorded numbers of 3 cm /hr storm in three different rain gauge stations were 3,1 and 4 for the periods of records, which were 25, 30 and 35 years respectively . Using the stations per year method, find the recurrence interval of the storm at any given point in the area.
- e. Write the functions of head works.
- f. What are the conditions of selection of site for Diversion head works?
- g. Draw neat sketch of Ogee spillway.

SECTION B**2. Attempt any three of the following:****7 x 3 = 21**

- a. The isohyets for the annual rainfall over a catchment basin and the areas of the strips between the isohyets are given below. Find the average depth of annual precipitation over the basin.

Isohytes cm	75-85	85-95	95-105	10-115	115-135	135-155
Area cm ²	580	2960	2850	1000	610	160

- b. Draw the neat sketch of Storage Zones of reservoir and define various storage zones.
- c. What do you understand by the river meandering? what are its causes ? Describe
- d. What do you understand by Diversion head works? And describe with neat sketch of Diversion head work.
- e. Three turbo-generators each of capacity 12000 kW have been installed at a hydel power station. During a certain period of load, on the plant varies from 15000 to 30000 kW. Calculate (i) Total installation capacity (ii) Load factor (iii) Plant factor (iv) Utilization factor

SECTION C**3. Attempt any one part of the following:****7 x 1 = 7**

- (a) The field capacity of a certain soil is 30% and its apparent specific gravity is 1.6 before applying irrigation water a wet sample of soil was taken & its mass was found as 150 gm. The same sample weighed as 136gm after oven drying. Determine the depth of water that must be applied to irrigate the soil to a depth of 0.9m.
- (b) Describe in brief advantages of Drip Irrigation system.

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4. Attempt any *one* part of the following: 7 x 1 = 7
- (a) Using Bazin's coefficient design a non alluvial channel carrying discharge of 15 cumecs with a mean velocity of 0.75 m/sec. The channel has bottom width as 5 times the depth of channel and has side slope 1:1 Assume $k=1.3$
- (b) Describe with neat sketches Inglis type fall.
5. Attempt any *one* part of the following: 7 x 1 = 7
- (a) Draw a neat plan and a cross-section of a typical barrage. Indicating the various components and describe each function.
- (b) Determine the number of siphon spillway units required for passing the flood safely with the following data. H.F.L. = 375.50 m, F.R.L. = 374.80, level of centre of siphon outlet = 368.30 m, High Flood discharge = 580 cumecs, width of siphon throat = 4.5 m, length of siphon throat = 2.0 m. The siphon of the spillway discharge freely in the air.
6. Attempt any *one* part of the following: 7 x 1 = 7
- (a) What is a siphon Aqueduct? when is it used? Draw a neat sketch of, briefly discuss of its hydraulic design.
- (b) Write the classification of groynes based on functional considerations and describe each with neat sketch.
7. Attempt any *one* part of the following: 7 x 1 = 7
- (a) Define phreatic line and how will you determine the phreatic line for earthen dam in which condition? and find the phreatic line above conditions.
- (b) Flow net was prepared for a 50 m high homogeneous dam, having 2.5 m free board and following data are collected. Number of potential drops = 20, Number of flow channel = 5 If the dam is provided 45 m length horizontal filter at d/s side. Determine the discharge per meter length of the dam. the coefficient of permeability of the dam is 2.5×10^{-3} cm/sec.