Sub Code:RCE702

Paper Id: 100750 Roll No:

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 isohytesfor the annual rainfall over a catchment basin and the areas of the strips between the isohytes 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.

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 $2.5X10^{-3}$ cm/sec.