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Total Number of Pages : 02

**B.Tech
PCI61102**

6th Semester Regular / Back Examination 2018-19

IRRIGATION ENGINEERING

BRANCH : CIVIL

Max Marks : 100

Time : 3 Hours

Q.CODE : F211

Answer Question No.1 (Part-1) which is compulsory, any EIGHT from Part-II and any TWO from Part-III.

The figures in the right hand margin indicate marks.

Part- I

Q1 Only Short Answer Type Questions (Answer All-10) (2 x 10)

- a) What is the classification of irrigation water having the concentrations of Na, Ca and Mg are 21, 3 and 2 milli-equivalents per litre respectively?
- b) The base period of paddy is 120 days. If the duty for this crop is 950 hectares per cumec, find the value of delta.
- c) The G.C.A. for a distributary is 6000 hectares, 80% of which is CCA. Find the area to be irrigated for wheat if the intensity of irrigation for wheat is 50%.
- d) Write the measures adopted to control water logging.
- e) Draw the typical cross section of canal syphon. How do you decide to provide this structure in field?
- f) What are the functions of divide wall provided in diversion head works?
- g) State the total Lane's creep length with sketch.
- h) Differentiate high gravity dam and low gravity dam.
- i) What is Phreatic line?
- j) What are the probable locations of spillway?

Part- II

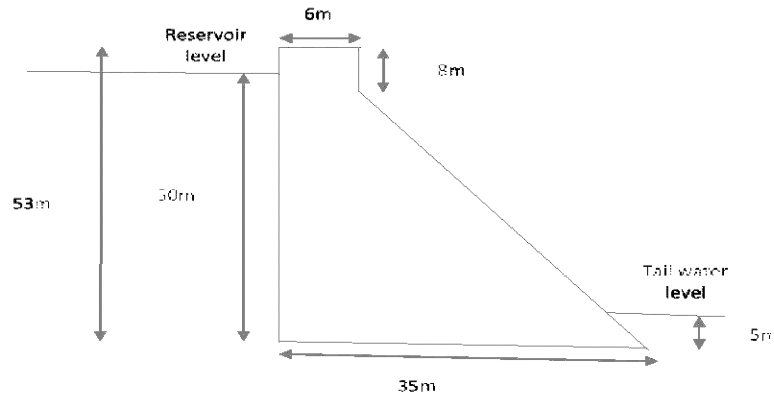
Q2 Only Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve) (6 x 8)

- a) Determine the head discharge of a canal using the following data. The value of the time factor may be assumed as 0.80.

Crop	Base period(days)	Area (hectare)	Duty(hectares/cumec)
Rice	120	4000	1500
Wheat	120	3500	2000
Sugarcane	310	3000	1200

- b) In a field, the field capacity of soil is 30%, permanent wilting point is 16%, dry density of soil is 1.5gm /c.c., effective depth of root zone is 80 cm and daily consumptive use of water for a given crop is 14mm. After how many days you will supply water to soil in order to ensure sufficient irrigation of the given crop?
- c) Design a regime channel for a discharge of 60 cumecs and silt factor 1.0, using Lacy's Theory.
- d) A canal of length 7 km and of discharge capacity 4 cumec is proposed to be lined with boulder lining. The total cost of lining is estimated as 4 lakhs. The life of lining is considered as 50 years. Justify the lining in the canal from the following data:
Rate of interest = 8%, Seepage loss = 2%, Revenue for irrigation water = Rs 80.00 per hect-m, maintenance cost per km for lined canal = Rs950.00, maintenance cost per km for unlined canal = Rs 2000.00, base period of crop = 120 days and additional benefit/km = Rs 800.00.
- e) Enumerate the process of reclamation of land affected by water logging.
- f) What is meant by cross drainage works? Explain the classification of cross drainage works with sketch.
- g) What are the important components of diversion head works? Illustrate their function(s).
- h) Name the different types of weirs and describe each type with a neat sketch.

- i) How do you calculate the forces due to weight of the dam, water pressure and uplift pressure on the gravity dam shown in figure. Unit weight of the concrete 24 kN/m^3 .

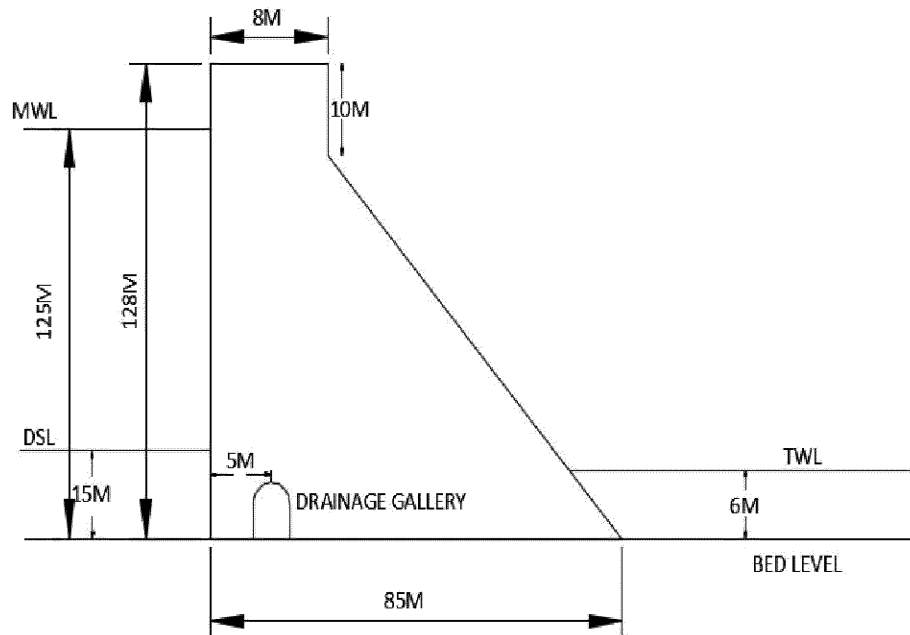


- j) Design practical profile for a low gravity dam with a water depth of 84 m, wave height 3 m and specific gravity of concrete 2.4, allowable compressive strength of 3000 kN/m^2 , top width of dam as 6 m.
- k) Discuss the causes of failure of earthen dam.
- l) Differentiate between Saddle Siphon spillway and Volute Siphon spillway.

Part-III

Only Long Answer Type Questions (Answer Any Two out of Four)

- Q3 Describe (with sketch) the following water distribution techniques adopted in farm : (i) Free flooding, (ii) Border flooding, (iii) Basin flooding, (iv) Furrow irrigation method (16)
- Q4 Discuss the different types of lining provided in canal. (16)
- Q5 Check the stability against overturning for the gravity dam shown in figure. Consider the following criteria: Static water pressure, uplift pressure, weight of dam, silt pressure. Assume any other data required. (16)



- Q6 What is meant by canal fall? Why are canal falls constructed in a canal system? With sketch describe the following falls: Ogee fall, Trapezoidal Notch fall, Sarda type fall, Montague type fall. (16)