**Hall Ticket Number: 18CE602**

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| **III/IV B.Tech (Regular) DEGREE EXAMINATION** | | | |
| **July, 2021** | **Civil Engineering** | | |
| **Sixth Semester** | **Irrigation Structures** | | |
| **Time:** Three Hours | | **Maximum: 5**0 Marks | |
| *Answer Question No. 1 Compulsorily.* | | | (10X1 = 10 Marks) |
| *Answer* ***ONE*** *questionfrom each Unit.* | | | (4X10=40 Marks) |

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| 1. | a) | In a current meter, what is the relation between number of revolutions and velocity of flow of the stream? | | **CO1** | |  |
|  | b) | Distinguish between safe yield and secondary yield. | | **CO1** | |  |
|  | c) | Define trap efficiency. | | **CO1** | |  |
|  | d) | Suggest a suitable dam for a deep V-shaped gorge. | | **CO2** | |  |
|  | e) | Classify dams based on hydraulic design. | | **CO2** | |  |
|  | f) | What do you understand by elementary profile of a gravity dam? | | **CO2** | |  |
|  | g) | What is the purpose of central core in a zoned embankment type earth dam? | | **CO3** | |  |
|  | h) | What is stilling basin? | | **CO3** | |  |
|  | i) | Differentiate between weir and barrage. | | **CO4** | |  |
|  | j) | When a big drain is crossing the canal, what type of aqaduct is preferred. | | **CO4** | |  |
| **Unit - I** | | | | | | |
| 2. | a) | Explain with neat sketches the methods of measuring the velocity at a point in stream using current meters and floats. | CO1 | | **10M** | |
|  |  | **(OR)** |  | |  | |
| 3. | a) | Discuss various factors to be considered for selecting a suitable reservoir site. | CO1 | | **5M** | |
|  | b) | Explain step by step procedure to determine reservoir capacity using mass curve method. | CO1 | | **5M** | |
| **Unit - II** | | | | | | |
| 4. | a) | What is a gravity dam? Describe the advantages and disadvantages of a gravity dam over an earth dam? | | CO2 | **5M** | |
|  | b) | Explain various modes of failure and stability requirements of gravity dams. | | CO2 | **5M** | |
|  |  | **(OR)** | |  |  | |
| 5. |  | A concrete gravity dam is of trapezoidal section having a top width of 2 m and bottom width of 12 m. The height of the dam is 15 m and the upstream face is vertical. Test the stability of the gravity dam for overturning and sliding in the full reservoir condition assuming no free board allowance. Consider only weight of the dam, hydrostatic pressure and uplift pressure. Also determine the compressive stresses at the toe and the heel. Assume specific weight of concrete as 24 kN/m3, unit shear strength of concrete as 1400 kN/m3, and the coefficient of friction between concrete and foundation soil as 0.7. Assume any additional data, if required. | | CO2 | **10M** | |
| **Unit - III** | | | | | | |
| 6. | a) | Explain hydraulic and seepage failures of earth dams with suitable figures wherever required. | | CO3 | **5M** | |
|  | b) | Discuss the criteria for safe design of earth dams. | | CO3 | **5M** | |
|  |  | **(OR)** | |  |  | |
| 7. | a) | Explain the following types of spillways and discuss their suitability.  (i) Ogee spillway and  (ii) Chute spillway | | CO3 | **5M** | |
|  | b) | Compute the discharge over an ogee spillway with coefficient of discharge equal to 2.5 at a head of 3 m. The effective length of spillway may be taken as 120 m. The spillway crest is 12 m above the bottom of the approach channel having the same width as that of spillway. Consider approach velocity also. | | CO3 | **5M** | |
| **P.T.O.**  **18CE602**  **Unit – IV** | | | | | | |
| 8. | a) | Draw a neat diagram of a diversion head work showing all its components. Write the functions of any three component parts. | | CO4 | **5M** | |
|  | b) | Explain Bligh’s creep theory and discuss criteria for safety against piping and safety against overturning according to Bligh’s creep theory. | | CO4 | **5M** | |
|  |  | **(OR)** | |  |  | |
| 9. | a) | Distinguish between the following cross-drainage works with neat diagrams.  (i) Aqueduct and Syphon aqueduct  (ii) Super passage and Canal syphon | | CO4 | **5M** | |
|  | b) | Explain the important considerations in selection of suitable type of cross-drainage work. | | CO4 | **5M** | |

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