**18CE602**

**Hall Ticket Number:**

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| **III/IV B.Tech (Regular/Supplementary) DEGREE EXAMINATION** | | | | | | | | | |
| **June, 2022** | | | | **Civil Engineering** | | | | | |
| **Sixth Semester** | | | | **Irrigation Structures** | | | | | |
| **Time:** Three Hours | | | | | **Maximum: 5**0 Marks | | | | |
| *Answer Question No. 1 Compulsorily.* | | | | | | (10X1 = 10 Marks) | | | |
| *Answer* ***ANY ONE*** *question from each Unit.* | | | | | | (4X10=40 Marks) | | | |
| 1. | a) | List various methods for measuring flow velocity in a stream. | | | | CO1 | |  |
|  | b) | Distinguish between safe yield and secondary yield. | | | | CO1 | |  |
|  | c) | What is mass inflow curve? | | | | CO1 | |  |
|  | d) | Choose a suitable dam for a deep V shaped gorge. | | | | CO2 | |  |
|  | e) | Define flood routing. | | | | CO1 | |  |
|  | f) | What is the shape of elementary profile of a gravity dam? | | | | CO2 | |  |
|  | g) | What is pore water pressure in earth dam? | | | | CO3 | |  |
|  | h) | Write equation for discharge over ogee spillway. | | | | CO3 | |  |
|  | i) | Define creep length according to Bligh’s creep theory. | | | | CO4 | |  |
|  | j) | Recommend a suitable cross drainage work, if the bed level of canal is +100.5 m and HFL of the drain is +101.0 m at the point of crossing. | | | | CO4 | |  |
| **Unit – I** | | | | | | | | |
| 2. | a) | Explain area-velocity method for the measurement of discharge of a stream. | | | | CO1 | **5M** | |
|  | b) | Describe a current meter with neat diagram. How do you measure velocity of a stream at a given point using current meter? | | | | CO1 | **5M** | |
|  |  | **(OR)** | | | |  |  | |
| 3. | a) | Explain with a neat diagram, various storage zones of a reservoir. | | | | CO1 | **5M** | |
|  | b) | Explain the procedure to determine the reservoir capacity from mass inflow curve. | | | | CO1 | **5M** | |
| **Unit – II** | | | | | | | | |
| 4. | a) | Examine various modes of failure and stability requirements of gravity dam | | | | CO2 | **5M** | |
|  | b) | Explain the classification of dams. | | | | CO2 | **5M** | |
|  |  | **(OR)** | | | |  |  | |
| 5. | a) | Explain the physical factors that govern the selection of type of dam. | | | | CO2 | **5M** | |
|  | b) | Determine self-weight, upstream hydrostatic force and uplift pressure for a gravity dam with the following data:  Top width of the dam: 5 m  Bottom width of dam : 12 m  The face exposed to water is vertical  Height of the dam = 22 m  Free board = 2 m  Unit weight of masonry = 23 kN/m3  Assume any data not given and needed. | | | | CO2 | **5M** | |
| **Unit – III** | | | | | | | | |
| 6. | a) | Discuss the criteria for safe design of earth dams. | | | | CO3 | **5M** | |
|  | b) | Explain various hydraulic and seepage failures that may occur in earth dams. | | | | CO3 | **5M** | |
|  |  | **(OR)** | | | |  |  | |
| 7. | a) | Describe chute spillway and syphon spillways with suitable diagrams. | | | | CO3 | **5M** | |
|  | b) | Explain energy dissipation below spillways with neat sketches. | | | | CO3 | **5M** | |
| **Unit – IV** | | | | | | | | |
| 8. | a) | Explain the following cross drainage works with neat sketches:   1. Super passage and Canal syphon 2. Level crossing and Inlets | | | | CO4 | **5M** | |
|  | b) | Explain various types of aqueducts with suitable sketches. | | | | CO4 | **5M** | |
|  |  | **(OR)** | | | |  |  | |
| 9. | a) | Explain causes of failure of weirs and suggest suitable remedial measures. | | | | CO4 | **5M** | |
|  | b) | Determine Uplift pressure at points A and B and thickness required at these points, for the hydraulic structure built on fine sand (Coefficient of creep, C = 15) shown below. Use Bligh’s creep theory. | | | | CO4 | **5M** | |

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