**20CE704/PE**

**Hall Ticket Number:**

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| **IV/IV B.Tech (Regular) DEGREE EXAMINATION** | | | |
| **January, 2024** | **Civil Engineering** | | |
| **Seventh Semester** | **Irrigation Structures** | | |
| **Time:** Three Hours | | **Maximum:** 70 Marks | |
| ***Answer question 1 compulsory.*** | | | **(14X1 = 14Marks)** |
| ***Answer one question from each unit.*** | | | **(4X14=56 Marks)** |
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|  |  |  | CO | BL | M |
| 1 | a) | Which factors are considered when choosing a location for a stream gauging station? | CO1 | L1 | 1M |
|  | b) | How does the dead storage of a reservoir serve its purpose?" | CO1 | L1 | 1M |
|  | c) | Comprehend the concept of the reservoir's safe yield. | CO1 | L1 | 1M |
|  | d) | Create a well-drawn sketch illustrating the distinct zones of a reservoir. | CO1 | L1 | 1M |
|  | e) | Clearly differentiate between rigid and non-rigid dams | CO2 | L1 | 1M |
|  | f) | Delineate the distinctions between low gravity dams and high gravity dams. | CO2 | L1 | 1M |
|  | g) | Understand the concept of a debris dam. | CO2 | L1 | 1M |
|  | h) | Comprehend the gravity dam concept. | CO2 | L1 | 1M |
|  | i) | Understand the role of transition filter criteria for an earth dam. | CO3 | L1 | 1M |
|  | j) | Highlighting two issues associated with the sudden drawdown of an earthen dam. | CO3 | L1 | 1M |
|  | k) | Describe the purpose of dam spillway | CO3 | L1 | 1M |
|  | l) | Distinguish between storage headworks and Diversion headworks. | CO4 | L1 | 1M |
|  | m) | Discuss Khosla's theory concerning impervious flow in subsurface flow. | CO4 | L1 | 1M |
|  | n) | For a canal crossed by a significant drain, what kind of aqueduct is preferred? | CO4 | L1 | 1M |
| **Unit-I** | | | | | |
| 2 | a) | Explain with neat sketch the method of measuring the velocity at a point in a stream using Current meter. | CO1 | L2 | 7M |
|  | b) | Explain with a neat sketch the methods of measuring the discharge at a point in a stream using moving boat method. | CO1 | L2 | 7M |
| **(OR)** | | | | | |
| 3 | a) | Describe in brief various investigations required for reservoir planning | CO1 | L3 | 7M |
|  | b) | The following information is available regarding the relationship between trap efficiency and capacity-inflow ration for a reservoir.   |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Capacity/Inflow ratio | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 | 1.0 | | Trap efficiency % | 87 | 93 | 95 | 95.5 | 96 | 96.5 | 97 | 97.2 | 97.3 | 97.5 |   Find the probable life of the reservoir with an initial reservoir capacity of 30 M-m3, if the annual flood inflow is 60 M-m3 and the average annual sediment inflow is 360,000 tonnes. Assume a specific weight of sediment equal to 1200 kg/m3. The useful life of the reservoir will terminate when 80% of initial capacity is filled with sediment. | CO1 | L3 | 7M |
| **Unit-II** | | | | | |
| 4 | a) | Discuss the physical factors that govern the selection of type of Dam? | CO2 | L2 | 7M |
|  | b) | Explain the various forces acts on a Gravity Dam with help of a neat sketch? | CO2 | L2 | 7M |
| **(OR)** | | | | | |
| 5 | a) | Discuss various modes of failures of a Gravity Dam in detail? | CO2 | L2 | 7M |
| **P.T.O**  **20CE705/PE** | | | | | |  |  | CO2 L3 |
|  | b) | Design the Practical profile of a Gravity Dam with the following data:  R.L of base of Dam = 1320 m  R.L of H.F.L = 1355m  Specific gravity of Dam material = 2.4  Height of waves = 1 m  Safe compressive stress for masonry = 120 t/m2. | CO2 | L3 | 7M |
| **Unit-III** | | | | | |
| 6 | a) | Discuss various causes of failure of earth dams with neat sketches. | CO3 | L3 | 7M |
|  | b) | Write brief note on slope protection of earth dam with neat sketches | CO3 | L2 | 7M |
| **(OR)** | | | | | |
| 7 | a) | What is spillway? What are its functions? Enumerate the different types of spillways and draw neat sketches showing each type | CO3 | L2 | 7M |
|  | b) | Enumerate the different types of earth dams and draw neat sketches showing each type | CO3 | L2 | 7M |
| **Unit-IV** | | | | | |
| 8 |  | Describe with the help of neat sketches various types of cross-drainage works | CO4 | L2 | 14M |
| **(OR)** | | | | | |
| 9 | a) | Write short notes with help of neat sketches on the following (i). Divide wall (ii) Fish ladder (iii) Head regulator | CO4 | L2 | 7M |
|  | b) | Figure 1.0. shows the section of a hydraulic structure founded on sand. Calculate the average hydraulic gradient. Also, find the uplift pressures at point 6 and 16 m from the u/s end of the floor and find the thickness of the floor at those points. | CO4 | L3 | 7M |

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