**D.Y. PATIL COLLEGE OF ENGINEERING & TECHNOLOGY**

**Set-: I**

**Q. Paper Code:**

**22CE304504**

**KASABA BAWADA KOLHAPUR-416006**

**(An Autonomous Institute)**

T. Y. B. Tech (Civil), Sem-V

**END SEMESTER EXAMINATION(ESE), DEC. – 2022**

Course Name: - **Irrigation Engineering,** Course Code: - **201CEL304**

Seat No:

**Day and Date: Tuesday, 13.12.2022**

**Time: 2.00 pm to 4.00pm Max. Marks- 50**

***Instructions:***

1. *All Questions are compulsory.*
2. *Figure to the right indicate full marks.*
3. *Give suitable general Instructions*
4. *Any other Course Specific Instructions.*
5. *No questions should repeat from MSE/ISE*

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| **BT** | **CO’s** | **Q.No.** |  | **Marks** |
|  |  | **Q.1** | **All Questions are compulsory** | **20** |
| **3** | **CO2** | **a** | The base period, intensity of irrigation and duty of water for various crops under a canal system are given in the table below. Determine the reservoir capacity if the culturable commanded area is 40000 hectares, canal losses are 20% and reservoir losses are 10%.   |  |  |  |  | | --- | --- | --- | --- | | **Crop** | **Base period (Days)** | **Duty of water at the field (hectares/cumec)** | **Intensity of irrigation (percentage)** | | Wheat | 120 | 1800 | 20 | | Sugarcane | 360 | 1700 | 20 | | Cotton | 180 | 1400 | 10 | | Rice | 120 | 800 | 15 | | Vegetables | 120 | 700 | 15 | | **8 M** |
| **6** | **CO3** | **b** | Design an irrigation channel in a non-erodible material to carry a discharge of 15 cumecs when the maximum permissible velocity is 0.8 m/s. Assume bed slope = 1 in 4000, side slope = 1:1 and manning’s N = 0.025. | **6 M** |
| **3** | **CO4** | c | Explain the volumetric basis method used for assessing the canal revenue. Briefly explain its merits and demerits. | **6 M** |
|  | | | | |
|  |  | **Q.2** | **All Questions are compulsory** | **10 M** |
| **1,2** | **CO3** | **a** | What is the purpose of construction of diversion head works? Distinguish clearly between a barrage and a weir. | **4 M** |
| **1,2** | **CO3** | **b** | Draw Neat sketches of following types of weirs and name their component parts –   1. Rockfill weir with sloping apron 2. Concrete weir with sloping glacis   **OR**  Draw the layout of a typical diversion headwork and name its various components. Briefly explain the functions of following components-   1. Divide wall 2. Undersluices | **6 M** |
|  | | | | |
|  |  | **Q.3** | **All Questions are compulsory** | **10 M** |
| **1,2** | **CO3** | **a** | Write a short note on Radial spillway gates. | **4 M** |
| **1,2** | **CO3** | **b** | Enlist the main types of failures of earth dams. Explain in detail the hydraulic failures.  **OR**  Explain the following modes of failure of gravity dams, along with required factor of safety against the failure.   1. Overturning 2. Sliding 3. Crushing | **6 M** |
|  | | | | |
|  |  | **Q.4** | **Attempt any two out of the following three questions** | **10M** |
| **1,2** | **CO2** | **a** | Explain how the area elevation curves and elevation storage curves are prepared ? | **5 M** |
| **1,2** | **CO2** | **b** | Explain the following curves with sketches -   1. Mass inflow curve 2. Demand curve | **5 M** |
| **1,2** | **CO2** | **c** | What do you understand by reservoir sedimentation? Explain with neat sketch role of density currents in sedimentation of dams. | **5 M** |

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