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

**Set-: I**

**Q. Paper Code:**

**22SYCE204304**

**KASABA BAWADA KOLHAPUR-416006**

**(An Autonomous Institute)**

S. Y. B. Tech Civil Engineering, Sem-III

**END SEMESTER EXAMINATION, Jan. – 2023**

Course Name: **Fluid Mechanics** Course Code: **201 CL 204**

Seat No:

**Day and Date: Monday, 23.01.2023**

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

***Instructions:***

1. *Question No. 1&2 is compulsory.*
2. *Figure to the right indicate full marks.*
3. *Give suitable general Instructions*
4. *Any other Course Specific Instructions.*

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| **BT** | **CO’s** | **Q. No.** |  | | **Marks** |
|  |  | **Q.1** | **All Questions are compulsory** | | **20** |
| **1** | **CO1** | **a** | 4 liters of crude oil weighs 47 N, calculate its specific weight, density and specific gravity. Specific gravity of glycerin is 1.25, what would be the volume of 200 N glycerin. |  | **6M** |
| **2** | **CO2** | **b** | Find total pressure force acting on unit length of dam if retained total depth of water is 100 m, out of which 10 m is silt of specific gravity 1.3. | **7 M** |
| **2** | **CO2** | c | An wooden cylindrical block 0.5 m diameter &5 m long  has specific gravity 0.75 is kept in an oil of special gravity  0.8. Check whether the cylinder can float in the oil with its  longitudinal axis vertical. If not find the maximum length to  float it in vertical position. | **7 M** |
|  | | | | | |
|  |  | **Q.2** | **All Questions are compulsory** | | **10** |
| **3** | **CO2** | **a** | State and Explain Bernoulli’s Equation with its assumptions. Draw HGL and TEL for any simple case of flow of water  **OR**  Draw neat sketch of orifice in a cylindrical tank and explain all the calibration constants |  | **4** |
| **3** | **CO2** | **b** | A horizontal Venturimeter is attached in 10 cm diameter pipe to measure discharge of water. Pressure gauge difference attached to Venturimeter is 100 Pa . Find discharge in LPS. Take appropriate value of coefficient of discharge and throat diameter. | **6** |
|  | | | | | |
|  |  | **Q.3** | **All Questions are compulsory** | | **10** |
| **2** | **CO3** | **a** | Explain Reynolds experiment and give any practical example of Laminar and turbulent flow  **OR**  Write a short note on Separation of Boundary Layer and its control |  | **4** |
| **3** | **CO3** | **b** | Oil is flowing in 40 mm diameter pipe at 2.0 LPS. Coefficient of kinematic viscosity and specific gravity of oil is 12 Stokes and 0.8 respectively. If length of pipe is 300 m, check the flow is laminar and find power required to overcome the viscous resistance to flow. | **6** |
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|  |  | **Q.4** | **Attempt any two out of three questions** | | **10** |
| **3** | **CO3** | **a** | A compound pipe in series comprises of 4 pipes. Length, diameter and friction factors for these pipes are ( 100 m , 10 cm , 0.001) , (200 m ,12 cm , 0.002) , (300 m , 14 cm , 0.003) , (500 m , 15cm , 0.004). If discharge flowing through this pipe is 1.5 cumec, find equivalent pipe length and diameter. Take fe = .001 |  | **5** |
| **3** | **CO4** | **b** | Two reservoirs are connected by 2 pipes of diameter 10 cm and 20 cm of equal length 2.00 Km. Level difference in water surfaces of these reservoirs is 10 m. Find the discharge in the pipe, if friction factor of both the pipes is 0.01. Consider all major and minor losses. | **5** |
| **3** | **CO4** | **C** | Experiments were conducted in wind tunnel at 70 KmPH on a flat plate of size 2m x 2m. The specific weight of air is 11.28 N/m3. The plate is inclined in such a way that coefficient of drag and lift are 0.15 and 0.75 respectively. Determine lift force drag force and resultant force and power exerted by air stream on plate. | **5** |

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