**Code No.PC406CE**

**METHODIST COLLEGE OF ENGINEERING & TECHNOLOGY**

**(An Autonomous Institution)**

**B.E. (CIVIL) IV-Semester (Supplementary) Examination, FEB-2024**

**Subject: FLUID MECHANICS**

**Time: 3 hours Max.Marks:60**

**Note: Missing data, if any, maybe suitably assumed.**

**PART-A**

**Answer All the questions. (10X2M=20M)**

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| **Q.No.** | **Questions** | **Marks** | **CO** | **BTL** |
| **1. a** | Define Specific weight and Kinematic viscosity of fluids. | 2M | CO1 | L1 |
| **b** | State the principle of Piezometer. | 2M | CO1 | L1 |
| **c** | Differentiate Uniform flow and Nonuniform flow with examples. | 2M | CO2 | L2 |
| **d** | List out limitations and applications of Flow net for a fluid flow. | 2M | CO2 | L1 |
| **e** | List outAssumptions of Bernoulli’s equation for incompressible flow. | 2M | CO3 | L1 |
| **f** | Define Convective and Local accelerations of fluid flow. | 2M | CO3 | L1 |
| **g** | State the function on which Mouthpiece works. | 2M | CO4 | L1 |
| **h** | Write advantages of Triangular notch over Rectangular notch. | 2M | CO4 | L2 |
| **i** | Write the dimensions for Pressure and Reynold’s number. | 2M | CO5 | L2 |
| **j** | Differentiate model and prototype. | 2M | CO5 | L2 |

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**PART-B**

**Answer Any Five questions**. **(5X8M=40M)**

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| **Q.No.** |  | **Questions** | **Marks** | **CO** | **BTL** |
| **2.** | **a** | The space between two square flat parallel plates is filled with oil. Each side of the plate is 60 cm. The thickness of the oil film is 12.5 mm. The upper plate, which moves at 2.5 m/sec, requires a force of 98.1N to maintain the speed. Find the   1. Dynamic viscosity of the oil in poise   (ii) Kinematic viscosity of oil in stokes if the specific gravity of oil is 0.95. | 3M | CO1 | L3 |
| **b** | Prove that pressure is same in all directions in a static fluid. | 5M | CO1 | L2 |
| **3.** | **a** | Explain the concepts of Velocity Potential and Stream Function for a fluid flow. | 6M | CO2 | L2 |
| **b** | Explain Laminar and Turbulent flows with examples. | 2M | CO2 | L2 |
| **4.** | **a** | Develop Bernoulli’s equation of motion for a fluid element along a stream line for an incompressible flow. | 6M | CO3 | L3 |
| **b** | A 0.25 m diameter pipe carries oil of specific gravity 0.8 at the rate of 120 liters per second and the pressure at a point A is 19.62 KN/m2(gage).If the point A is 3.5 m above the datum line, calculate the total energy at point A in meters of oil. | 2M | CO3 | L3 |
| **5.** | **a** | Develop an expression for discharge through an Orificemeter. | 6M | CO4 | L3 |
| **b** | Find the discharge over a Triangular notch of an angle 600 when the head over the notch is 0.3 m. Assume that Cd as 0.6. | 2M | CO4 | L3 |
| **6.** | **a** | Define the terms Dimensional analysis. | 3M | CO5 | L2 |
| **b** | Explain Buckingham Pi theorem for Dimensional analysis. | 5M | CO5 | L3 |
| **7.** | **a** | Explain the working procedure of the U-tube Manometer with a neat sketch. | 6M | CO1 | L2 |
| **b** | When 2500 liters of water flows per minute through a 30 cm diameter pipe which later reduces to 15 cm diameter pipe, find the velocities of flow in the two pipes. | 2M | CO2 | L3 |
| **8.** | **a** | Explain Vortex flow with examples. | 4M | CO3 | L2 |
| **b** | Discuss about Elbowmeter with a neat sketch. | 4M | CO4 | L1 |
| **9.** | **a** | Explain Rayleigh method in dimensional analysis. | 4M | CO5 | L2 |
| **b** | Develop an equation for the rate of flow through a Rectangular notch. | 4M | CO4 | L3 |

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