

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION SP2023)**

**CLASS: IMSc
BRANCH: FOOD TECH**

**SEMESTER : IV
SESSION : SP2023**

**SUBJECT: FT212 FLUID MECHANICS AND MECHANICAL OPERATIONS
TIME: 02 Hours**

FULL MARKS: 25

INSTRUCTIONS:

1. The question paper contains 5 questions each of 5 marks and total 25 marks.
 2. Attempt all questions.
 3. The missing data, if any, may be assumed suitably.
 4. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates
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|--------|---|-------|-----------|-----------|
| Q.1 | A 30 cm diameter pipe, conveying water, branches into two pipes of diameters 20 cm and 15 cm respectively. If the average velocity in the 30 cm diameter pipe is 2.5 m/s, find the discharge in this pipe. Also determine the velocity in 15 cm pipe if the average velocity in 20 cm diameter pipe is 2 m/s. | [5] | CO
CO1 | BL
BL5 |
| Q.2 | Define the following fluid properties:
(i) Density (ii) Specific Weight (iii) Specific volume (iv) Specific gravity (v) Viscosity of a fluid | [5x1] | CO1 | BL1 |
| Q.3(a) | What do you understand by the term Major and Minor loss, if a fluid is flowing through a pipe? | [2] | CO1 | BL2 |
| Q.3(b) | Discuss the various flow patterns in agitated vessel? | [3] | CO2 | BL2 |
| Q.4 | Describe the principle and working of a reciprocating pump with a neat sketch? | [5] | CO2 | BL2 |
| Q.5 | Discuss U-tube manometer and derive an expression for the measurement of pressure. | [5] | CO2 | BL5 |

:22/02/2023:M