Roll No. ☐☐☐☐☐☐☐☐☐☐☐   **Total No. of Pages : 02**

Total No. of Questions : 09

B.Tech. (Marine Engg.) (2013 Onwards)   (Sem.–4)
FLUID MECHANICS
Subject Code : BTME-403
M.Code : 72436

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

INSTRUCTIONS TO CANDIDATES :
1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**
4. **Standard tables are allowed. Assume any missing data.**

SECTION-A

1. **Answer briefly :**

    a) Define surface tension.

    b) What is a manometer?

    c) Define total pressure.

    d) Explain path line.

    e) What is rotational flow?

    f) What is the function of an orifice meter?

    g) What is meant by dimensional analysis?

    h) What is laminar sub-layer?

    i) What do you mean by Mach number?

    j) Define degree of turbulence.

SECTION-B

2. What is meant by intensity of pressure? How it varies with the depth of fluid? Discuss.

3. Define stream function and clearly bring out its physical significance. Enumerate some of the salient features of the stream function.

4. What is meant by turbulence? How does it affect the flow properties? Discuss.

5. Differentiate between fundamental quantities and derived quantities.

6. How metacentric height is determined? Discuss.

SECTION-C

7. Describe Buckingham's Pi theorem for dimensional analysis.

8. The stream function in a two dimensional flow $\Psi = 6x - 4y + 7xy$. Check whether the flow is irrotational. Make calculations for the acceleration of the fluid element and the direction of streamline at point P (1, –1).

9. Derive Euler's equation of motion along a stream line for an ideal fluid stating clearly the assumptions made.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.