

Code No. : 5437/N

FACULTY OF ENGINEERING B.E. 2/4 (M/P) II Sem. (New) (Main) Examination, May/June 2012 FLUID DYNAMICS

Time: 3 Hours]

[Max. Marks:75

Note: 1) Answer all questions from Part A.

2) Answer five questions from Part B.

PART-A

(10×2.5=25 Marks)

Answer all the questions:

- 1. Is there is any analogy of Hooke's law in fluids? If so, state the parallel law in fluids.
- 2. Differentiate between dynamic viscosity and kinematic viscosity.
- 3. Define stream line, path line and streak line. When they coincide?
- 4. Define nominal thickness of boundary layer.
- 5. Define:
 - i) Circulation and
- ii) Vorticity
- 6. What is Prandtl tube? State its practical use.
- 7. Why is coefficient of discharge of an orifice meter much smaller than that of venturimeter?
- 8. What are the advantages of triangular notch when compared to rectangular notch?
- 9. What is Laminar sub layer? Define it.
- 10. Define adiabatic flow.

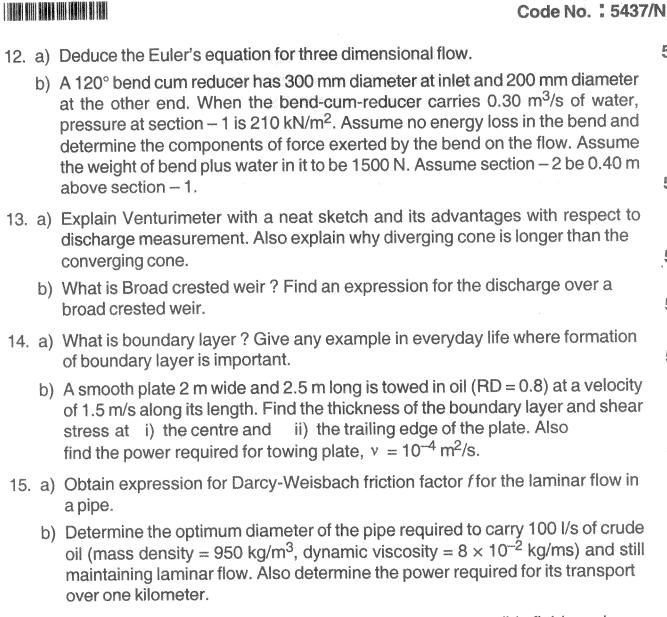
PART-B

50 Marks

- 11. a) Define and distinguish between steady flow and unsteady flow and show that the flow rate per unit width between stream lines in two dimensional flow is equal to the difference between the values of the stream function corresponding to these stream lines.
 - b) Two velocity components in a two dimensional flow field for an incompressible fluid are expressed as u=2y and v=2x. Show that these functions represent a possible case of an irrotational flow and obtain an expression for stream function.

5

5



16. a) Explain velocity of sound in compressible and incompressible fluids and derive the expression for velocity of sound in adiabatic process.

b) Define temperature, pressure and density ratios as functions of match number. 4

17. Write short note on the following:

 $(4\times2.5=10 \text{ Marks})$

- i) Free vortex and forced vortex.
- ii) Growth of Laminar boundary over a flat plate.
- iii) Adiabatic and isothermal expansion.
- iv) Energy correction factor.

1,400

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5

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