24087

B.Tech 3rd Semester (AUE) F-Scheme Examination,

December–2016

FLUID MECHANICS AND MACHINERY

Paper–AUE-203-F

Time allowed : 3 hours]　　　　[Maximum marks : 100

Note : Attempt first common question, which is **compulsory**, and **one** question from each of the four sections.

1.　(a)　What is Buoyancy ?

　　(b)　Give the application of momentum equations.

　　(c)　What are the energy losses in pipe ?

　　(d)　What is priming ? Discuss.

　　(e)　What are assumptions in Bernoulli's equation ?

　　　　　　　　　　　　　　　$5 \times 4 = 20$

Unit–I

2.　Find the total pressure and position of center of pressure on a triangular plate of base 2m and height 3m which is immersed in water in such a way that the plan of the plate makes an angle of 60° with the free surface of the water. The base of the plate is parallel to the water surface and at a depth of 2.5 m from water surface.　　20

3.　(a)　Write short notes on differential manometers. Stability of floating body and classification of fluids.

　　(b)　Write short notes on surface tension, capillarity, real and ideal fluids.　　20

Unit–II

4. The horizontal 8m long pipe is tilted at an angle of 35°. At the lower level, the section of pipe is of 90mm diameter and the upper level of the pipe with large section is of 250mm diameter. If the pipe is equally tapering and the velocity of water at the lower section is 1.5m/s, calculate the difference of pressures between the upper and lower sections.   20

5. Determine the difference in the elevations between the water surfaces in two tanks which are connected by a horizontal pipe of diameter 300 mm and length 400m. If the rate of flow of water through the pipe is 300 lit./s. Consider all losses and take value of f=0.008. Also Draw the Hydraulic gradient Total energy lines.
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Unit–III

6. A lubricating oil of specific gravity 0.85 and kinematic viscosity 10 cm²/s is pumped at a rate of 12 lit./s through two pipes in parallel, one 8 cm in diameter and other 10 cm diameter, both pipes being 1000m long. Calculate the flow rate through each pipe and horse power of each pipe.   20

7. Derive the expression for flow relation between shear stress and pressure gradient.   20

Unit–IV

8. With the help of neat sketch explain the principles and working of gear vane pump.   20

9. Explain the principles of operations of centrifugal and axial pumps. http://haryanapapers.com   20