

R09**Code: 9A01304****B.Tech II Year I Semester (R09) Supplementary Examinations December 2015****FLUID MECHANICS****(Civil Engineering)**

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions

All questions carry equal marks

- 1 (a) Explain about atmospheric, gauge and vacuum pressure.
(b) Find the height of water column corresponding to a pressure of 54 kN/m^2 .
- 2 (a) A circular plate 4 m diameter is submerged in water with its greatest and least depths below the surface being 3m and 1 m respectively. Determine the total pressure and centre of pressure.
(b) Explain about total pressure.
- 3 Find the velocity and acceleration at a point (1, 2, 3) after 1 second for a three dimensional flow given by $u = (yz + t)$, $v = (xz - t)$, $w = (xy)$
- 4 (a) What are the applications of Bernoulli's equation?
(b) A pipe of diameter 400 mm carries water at a velocity of 250 m/s. The pressures at the points A and B are given as 30 N/cm^2 and 20 N/cm^2 respectively while the datum head at A and B are 28 m and 32 m. Find the loss of head between A and B.
- 5 Explain the effect of pressure gradient on boundary layer separation.
- 6 Water is flowing through a 200 mm diameter pipe with coefficient of friction $f = 0.04$ the shear stress at a point 40 mm from the pipe axis is 0.00981 N/cm^2 . Find shear stress at pipe wall.
- 7 (a) What is a compound pipe? Explain in detail.
(b) Explain pipes in parallel.
- 8 (a) What is a stepped notch?
(b) Find the discharge through a trapezoidal notch which is 1m wide at the top and 0.40 m at the bottom and is 30 cm in height. The head of water on the notch is 20 cm. Assume C_d for rectangular portion as 0.62 while for triangular portion = 0.60.
