

MAHARASHTRA ANIMAL AND FISHERY SCIENCES UNIVERSITY, NAGPUR
SEMESTER END THEORY EXAMINATION, B. TECH. (D.T.) DEGREE COURSE 2018-19

Semester	: I (V Dean)	Academic Year	: 2018-2019
Course No.	: DE-102	Course Title	: Fluid Mechanics
Credits	: 2+1=3	Total Marks	: 50
Day & Date	: Tuesday, 09/01/2019	Time	: 11.00 to 13.00 Hrs

- Note :**
- 1) All questions from **Section 'A'** are compulsory.
 - 2) Solve **Any Three** questions from **Section 'B'**.
 - 3) Draw neat and well labeled diagram wherever necessary.

SECTION – 'A'

Q. 1. A) Choose the most appropriate answer from the options given below. (05)

- i) Ideal fluid is one which is
 - a) compressible, posses viscosity, and surface tension.
 - b) incompressible and has no viscosity and surface tension.
 - c) compressible, has no viscosity and surface tension.
 - d) None of these
- ii) In Newtonian fluids, shear stress is
 - a) directly proportional to velocity gradient.
 - b) inversely proportional to velocity gradient
 - c) equal to velocity gradient
 - d) None of these
- iii) Poise is the unit of
 - a) velocity gradient
 - b) mass density
 - c) kinematic viscosity
 - d) viscosity
- iv) Continuity equation deals with the law of conservation of
 - a) mass
 - b) energy
 - c) momentum
 - d) None of these
- v) The rate of flow through a venturimeter varies as
 - a) H
 - b) \sqrt{H}
 - c) $H^{3/2}$
 - d) $H^{5/2}$

B) Define the following. (05)

- i) Gauge pressure
- ii) Newtonian fluid
- iii) Capillarity
- iv) Coefficient of discharge
- v) Compressibility

Q. 2 A) State formula for following (05)

- i) Volumetric flow rate
- ii) Viscosity
- iii) Discharge through rectangular notch
- iv) Intensity of pressure on vertically immersed objet.
- v) Reynolds number

- B) Correct the given statement. (05)
- i) The discharge through a trapezoidal notch is the combination of discharge through rectangular notch and an orifice
 - ii) For low discharge measurements trapezoidal notch gives accurate results than V notch.
 - iii) Orifice meter works on the same principle as that of triangular notch.
 - iv) For laminar flow, fluid particles crosses flow paths of each other.
 - v) Centrifugal pump consists of piston which moves in cylinder to pump the fluid from lower level to higher level.

SECTION – 'B'

- Q. 3 A) A pipe 300 mm in diameter branches into two pipes of diameters 150 mm and 200 mm. The average velocity of water in 300 mm diameter pipe is 2.5 m/s. Determine the velocity of water in the 150 mm diameter pipe if the average velocity in the pipe of 200 mm diameter is 2.0 m/s. (05)
- B) A right angled triangular notch is discharging water under a constant head of 300 mm. What will be the discharge, if C_d of the notch is 0.61. (05)
- Q. 4 A) Derive the relations to calculate the losses of head due to sudden enlargement. (05)
- B) Explain the various fluid properties. (05)
- Q. 5 A) Write a note on Differential manometers (03)
- B) Write a note on Flow measurement. (03)
- C) State Bernoulli's Theorem. Write the assumptions involved in the derivation of Bernoulli's theorem. (04)
- Q. 6 A) On what parameters the pump selection depends? (03)
- B) Name any six pipe fittings used in dairy plants. (03)
- C) State and prove Pascal's law. (04)
- Q. 7 Classify the pumps. Write down the constructional features of centrifugal and reciprocating pump. (10)
