

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

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|------------|------------------------|---------------|-----------------------|
| Semester | : I (New Syllabus) | Academic Year | : 2018-2019 |
| Course No. | : DE- 103 | Course Title | : Fluid Mechanics |
| Credits | : 2+1=3 | Total Marks | : 50 |
| Day & Date | : Thursday, 10/01/2019 | Time | : 11.00 to 13.00 Hrs. |

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

SECTION –‘A’

- Q. 1. A) Choose the most appropriate answer from the options given below. (05)
- i) Theoretical velocity of the jet at vena contracta is
 - a) $\sqrt{2gh}$
 - b) $2\sqrt{gh}$
 - c) $2g\sqrt{h}$
 - d) $2gh$
 - ii) For flow, the value of Reynolds number is greater than 2100.
 - a) Laminar
 - b) Turbulent
 - c) Transition
 - d) None of these
 - iii) The property of the fluid which offers resistance to the flow of fluids is known as
 - a) Capillarity
 - b) Cohesion
 - c) Viscosity
 - d) Acidity
 - iv) 1 Pa of pressure is equal to
 - a) 1 N/m^2
 - b) 1 kN/m^2
 - c) 1 MN/m^2
 - d) None of these
 - v) The manometer is used to measure
 - a) Positive pressure
 - b) Negative pressure
 - c) Atmospheric pressure
 - d) Both a) and b)
- B) State the function of the following. (05)
- i) Simple U Tube manometer.
 - ii) Inclined tube manometer.
 - iii) Differential manometer.
 - iv) Pitot tube
 - v) Micro manometer.
- Q. 2 A) Give the formulae of the following. (05)
- i) Bernoulli's equation
 - ii) Pascal's law
 - iii) Reynolds number
 - iv) Darcy's equation
 - v) The velocity measured by pitot tube

- B) State whether the following statements are True or False, If False, rewrite the statement after making necessary corrections. (05)
- i) The SI unit of dynamic viscosity is m^2/s .
 - ii) Bernoulli's equation is assumed that the flow is incompressible.
 - iii) A mouthpiece increases the co-efficient of discharge.
 - iv) All liquids are fluid but all fluids are not liquid.
 - v) Absolute pressure is the algebraic sum of the gauge pressure and atmospheric pressure.

SECTION – 'B'

- Q. 3 A masonry wall 5 meters high and 2 meters wide is containing water up to a height of 4 meters. If the co-efficient of friction between the wall and the soil is 0.6, check the stability of the wall. Take specific weight of masonry as 2000 kg/m^3 . (06)
- Q. 4 What is notch? Derive the expression for discharge through a rectangular notch. (06)
- Q. 5 Derive the expression of Fanning Frictional Factor (f) for laminar flow in a pipe. (06)
- Q. 6 A) Explain the term 'Vena Contracta'. (02)
B) State Pascal's law. (02)
C) Write short note on Bourdon tube pressure gauge. (02)
- Q. 7 A) What are the various losses of head of flowing liquid in a close conduit? (03)
B) What is the condition of floating a body in a liquid? What is the difference between centre of gravity (C.G) and centre of buoyancy (C.B) of a floating body? (03)
- Q. 8 A) State the Archimedes' principle. (02)
B) Explain the terms centre of buoyancy and metacentre. (02)
C) Sketch the different types of mouthpieces. (02)
- Q. 9 A) What do you mean by pressure head? (02)
B) What are the dimensional formulae of the following two physical quantities? (04)
(i) Dynamic viscosity
(ii) Surface tension
