

MAHARASHTRA ANIMAL AND FISHERY SCIENCES UNIVERSITY, NAGPUR
SEMESTER END THEORY EXAMINATION, B. Tech. Dairy Technology 2019-20

Semester	: I (V Dean)	Academic Year	: 2019-2020
Course No.	: DE-102	Course Title	: Fluid Mechanics
Credits	: 2+1=3	Total Marks	: 50
Day & Date	: Friday, 10.01.2020	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 labelled diagram wherever necessary.

SECTION – 'A'

Q. 1. A) Choose and indicate the most appropriate answer for the following. (05)

- i) Fluids which do not follow the linear relationship between shear stress and rate of deformation are called
 - a) Newtonian fluids
 - b) Non Newtonian fluids
 - c) Dialatent fluids
 - d) Ideal fluids
- ii) The fundamental SI unit of pressure is N/m^2 is also known as.....
 - a) Pascal
 - b) Poise
 - c) Stoke
 - d) None of these
- iii) The magnitude of buoyant force can be determined by
 - a) Newton's law
 - b) Archimedes principle
 - c) Principle of moments
 - d) None of these
- iv) Which of the following measuring device is based on Bernoulli's principle
 - a) Venturimeter
 - b) Orifice meter
 - c) Pitot tube
 - d) All of these
- v) In centrifugal pumps cavitation is reduced by
 - a) Increasing the flow velocity
 - b) Reducing the discharge
 - c) Throttling the discharge
 - d) Reducing the suction head

B) Define the following. (05)

- i) Viscosity
- ii) Vena Contracta
- iii) Reynolds number
- iv) Piezometer
- v) Critical velocity

Q. 2 A) Give reasons for the following. (05)

- i) Floatation of a submerged body in fluid.
- ii) Upward lift to Aeroplanes.
- iii) Flow through Siphon.
- iv) Pressure loss in orifice meter is more than that for venturimeter.
- v) Buckingham's Pi-method is preferred for Dimensional analysis.

(P.T.O.)

- B) State whether the following statements are True or False. If false, rewrite the statement after making necessary corrections. (05)
- i) Incompressible fluid with Zero viscosity is called Ideal Fluid.
 - ii) Negative gauge pressure or Vacuum exists above absolute Zero pressure.
 - iii) Froude number governs the dynamic similarity of the flow when the gravitational force is more significant.
 - iv) SI unit of kinematic viscosity is m^2/s .
 - v) Capillarity is the phenomenon of rise or fall of liquid surface relative to the adjacent general level of liquid.

SECTION – 'B'

- Q. 3 A) What is Venturimeter? Derive an expression for discharge through Venturimeter. (05)
B) Derive an expression for discharge over a rectangular notch. (05)
- Q. 4 A) Derive Chezy's equation for loss of head due to friction in pipe. (05)
B) What is a Pitot tube? Derive an expression for velocity at any point of flow through Pitot tube. (05)
- Q. 5 A) What is dimensional analysis? What are its advantages and limitations? (05)
B) What are the criteria for selection of repeating variable in dimensional analysis? (05)
- Q. 6 Write short note on (Any Two). (10)
A) Pascal's law
B) Metacentric height
C) Bourdon's tube pressure gauge
D) Orifice
- Q. 7 State and derive Bernoulli's theorem, and write its limitations. What would be the velocity in main line of 81mm diameter, if line bifurcates into 38mm carrying liquid at 2m/s and 43 mm carrying liquid at 1.5 m/s? (10)
