

KERALA AGRICULTURAL UNIVERSITY

B.Tech (Food.Engg.) 2012 & Previous Admissions
IIIrd Semester Final Examination-January-2017

Cat. No: Cien.2105.

Marks: 80.00

Title: Fluid Mechanics (2+1)

Time: 3 hours

I Fill in the blanks/State true or False/ Define

(10x1=10)

1. What is density of fluid having specific gravity 13.6
2. When the fluid is at rest, the shear stress is _____
3. Pitot tube is a _____ measuring device
4. A fluid having Reynolds number 4500 is Turbulent flow. (True/ False)
5. Ideal fluids are compressible (True/ False)
6. Define centre of buoyancy
7. m^3 / Kg are the unit for?
8. What is coefficient of contraction?
9. Define delivery head
10. How are weirs classified?

II Write short notes/answers on any TEN of the following

(10x3=30)

1. Write the relation between viscosity and temperature for liquid and gases.
2. What is priming, why it is necessary
3. Write Bernoulli equation
4. Differentiate between piezo meter and pressure gauge
5. What are cavitations? What are its causes?
6. How does viscosity of fluid vary with temperature
7. Write an expression for Momentum equation for compressible fluid
8. State the Newton's law of viscosity and give examples of its application.
9. A water bottle at rest, with a uniform bottom surface and a diameter of 8 cm, filled with 2 liter of water is placed on top of a table, above a piece of paper. Find the pressure exerted by the bottle on the paper. Neglect the weight of paper.
10. Out of Orifice and venture meter, which one is a better fluid measuring device, explain with suitable example
11. What is a drag force on a sphere in the stoke range?
12. Draw a neat velocity profile diagram for a liquid column with a floating vessel at the top and submerged vessel in the column. Both the floating vessel and submerged vessel are moving in the opposite direction

III Write short answers on any SIX

(6x5=30)

1. What is Euler equation of motion? How will you obtain Bernoulli's Equation from it?
2. A plate of 600 mm length and 400 mm wide is immersed in a fluid of sp. gravity 0.9 and kinematic viscosity ν is $10^{-4} m^2 / s$. The fluid is moving with a velocity of 6 m/s. Determine (i) boundary layer thickness (ii) Shear stress at the end of the plate
3. An oil of sp.gr.0.8 is flowing through a venturimeter having inlet diameter 20 cm and throat diameter 10 cm. The oil mercury differential manometer shows a reading of 25 cm. Calculate the discharge of oil through the horizontal venturimeter. Take $C_d = 0.98$
4. Write a detailed description about type of valves.
5. Define Mach number, Froude number, Stokes Law.
6. Show that the value of the coefficient of friction for viscous flow through a circular pipe is given by; $f = 16 / Re$, where Re is Reynolds number.

7. Explain the difference in working of reciprocating pump and rotary pump along with their uses.
8. Explain the terms: (i).Pipes in parallel (ii). Equivalent pipe and (iii). Equivalent size of the pipe.

IV Write essay on any ONE

(1x10=10)

1. What do you mean by pump characteristic? Briefly explain the uses of such characteristics?
2. The right limb of a simple U-tube manometer containing mercury is open to the atmosphere while the left limb is connected to a pipe in which a fluid of specific gravity 0.9 is flowing. The centre of the pipe is 12 cm below the level of mercury in the right limb. Find the pressure of fluid in the pipe if the difference of mercury level in the two limbs is 20 cm.
