

F.Y.B.SC. SEM – I (2014 Course) : WINTER - 2018

SUBJECT : PHYSICS : MECHANICS & PROPERTIES OF MATTER (P – 11)

Day : Friday
Date : 12/10/2018

W-2018-0771

Time : 12.00 NOON TO 02.00 PM
Max. Marks : 40

N.B.:

- 1) All questions are **COMPULSORY**.
 - 2) Figures to the right indicate **FULL** marks.
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Q.1 Attempt **ANY TWO** of the following: [10]

- a) Explain the rise of liquid in a capillary tube in detail.
- b) State and explain Kepler's laws of planetary motion.
- c) Derive the expression for bending moment $\tau = \frac{YI}{R}$, where symbol's have their usual meanings.

Q.2 Attempt **ANY TWO** of the following: [10]

- a) Calculate the moment of inertia of hollow cylinder about an axis perpendicular to its axis and passing through its centre.
- b) A capillary tube having bore of 0.5 mm stand vertically in a large vessel containing a liquid of surface tension 40×10^{-13} N/m. The liquid wets the tube and its density is 0.75×10^3 kg/m³. Determine the rise of liquid in capillary.
- c) What is Reynold's number? Give its significance.

Q.3 Attempt **ANY TWO** of the following: [10]

- a) Compare turbulent flow and stream line flow.
- b) Explain surface tension in Jaeger's method.
- c) Derive the equation of motion for rotational body.

Q.4 Attempt **ANY FIVE** of the following: [10]

- a) Draw neat diagram of large mercury drop in Quinckes method.
- b) Define the term angle of contact in surface tension.
- c) State equation of continuity.
- d) Define shearing stress and shearing strain.
- e) State principle of single stage rocket.
- f) Define the terms plasticity and elasticity.
- g) Calculate the poisson's ratio for steel, given that Young's modulus = 2×10^{12} dyne / sq.cm and rigidity = 8×10^{11} dyne / sq.cm.

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