

Total No. of Questions : 4]

SEAT No. :

PB69

[6268]-264

[Total No. of Pages : 3

S.E. (AUTOMOBILE & Mechanical) (Insem)

FLUID MECHANICS

(2019 Pattern) (Semester - IV) (202049)

Time : 1 Hour]

[Max. Marks : 30

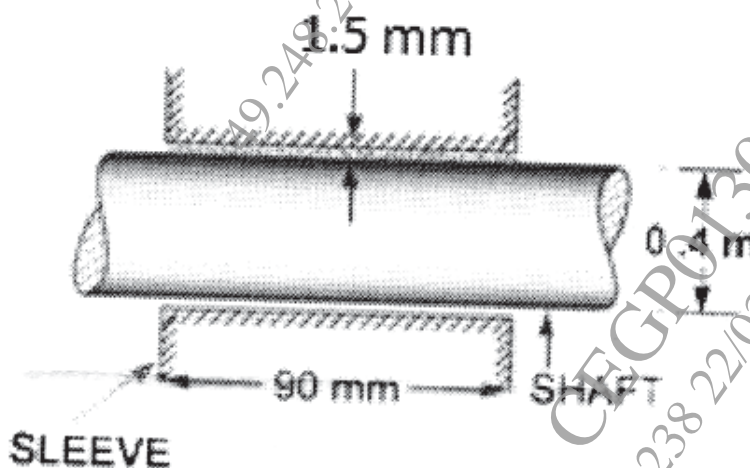
Instructions to the candidates:

- 1) Answer Q.1 or Q.2, Q.3 or Q.4.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Assume suitable data, if necessary.

Q1) a) Define the following properties of fluid with SI units, [8]

- i) Specific Gravity
- ii) Kinematic Viscosity
- iii) Specific Weight
- iv) Specific Volume

b) The dynamic viscosity of an oil, used for lubrication between a shaft and sleeve is 6 poise. The shaft is of diameter 0.4m and rotates at 190 r.p.m. Calculate the power lost in the bearing for a sleeve length of 90 mm. The thickness of the oil film is 1.5 mm. [7]



OR

P.T.O.

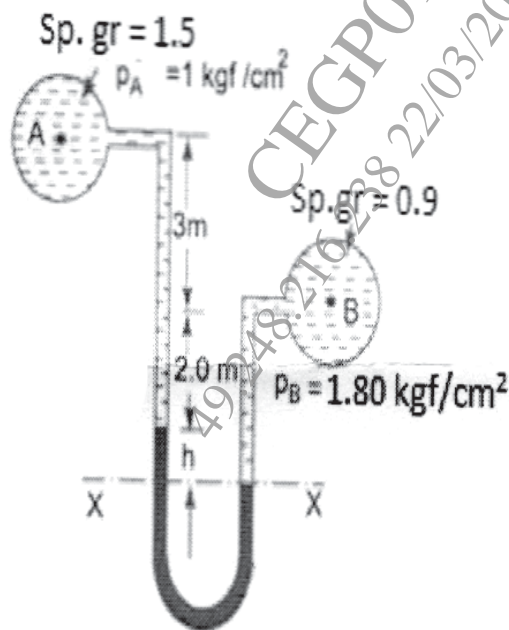
Q2) a) Explain the phenomenon of capillarity. Obtain an expression for capillary rise of a liquid. [7]

b) Explain in brief: [8]

- i) Surface tension
- ii) Vapour pressure
- iii) Compressibility

Q3) a) State and prove Hydrostatics law [7]

b) A differential manometer is connected at the two points A and B of two pipes as shown in below figure. The pipe A contains a liquid of specific gravity = 1.5 while pipe B contains a liquid of specific gravity = 0.9. The pressure at A and B are 1 kgf/cm^2 and 1.80 kgf/cm^2 respectively. Find the difference in mercury level in the differential manometer. ($1 \text{ kgf} = 9.81 \text{ N}$) [8]



OR

- Q4) a)** Show that the distance between the meta-centre and centre of buoyancy is given by. [7]

$$BM = \frac{I}{\nabla}$$

Where,

I = Moment of inertia of the plan of the floating body at water surface about longitudinal axis.

∇ = Volume of the body sub merged in liquid.

- b) Determine the total pressure and centre of pressure on an isosceles triangular plate of base 4 m altitude 4m when it is immersed vertically in an oil specific gravity 0.9. The base of the plate coincides with the free surface of oil. [8]

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