08/A/C

A

(WORKSHOP CALCULATION AND SCIENCE)

Time : 3 Hours *Marks : 50*

Note : Attempt FIVE questions. Question No. 1 is COMPULSORY. All questions carry EQUAL marks.

1. Fill in the blanks :—
   (a) 1 foot in FPS = ... in CGS.
   (b) Volume of sphere = ...
   (c) In side calipers is used to measure ..... .
   (d) 1 μm = ...
   (e) Snap gauges are used to measure the ..... .
   (f) Metric Horse Power = ... Watt.
   (g) The sum of internal angles of a triangle is ..... .
   (h) Multi start threads are used in ..... .
   (i) ..... threads are and for transmission of power.
   (j) 1 mile = ... km.

2. (a) What do you mean by stress and strain ? Write the different types of these with formulae.
   (b) Determine the volume of a cone of base circle diameter 5 cm and height 10 cm.

3. (a) What is a lever ? Explain different types of levers with examples.
   (b) Find the force required to punch a hole of 10 mm dia in a 1 mm thick plate if the allowable shear stress is 50 N/mm².

4. (a) Define module, D.P., P.C.D. of a gear. Explain the different types of gears with their uses.
   (b) A steel wire 3 mm dia is loaded in tension with a weight of 50 kg. Find out the stress developed.

5. Solve :—
   (a) $\frac{7x+4}{3x+5} = \frac{4x+3}{2x+9}$
   (b) With the help of logarithmic table, find out the value of :
   $\frac{7}{2}\ \sqrt{5} \times 26.73$

6. Find the cost of painting a room of walls 7 × 3 (2 Nos) and 4 × 3 (2 Nos) and a door of 1.25 × 20 and a window 0.75 × 1.5, if all the dimensions are in meter and painting rates are Rs. 5 per square feet.

7. (a) State the laws of friction and the methods of minimizing friction. Give some situations when friction is desired.
   (b) What do you mean by lifting machines ? Give their classification with applications. How do we find the efficiency of lifting machines ?
