

04/B/C

B

WORKSHOP CALCULATION AND SCIENCE

Time : 3 Hrs.

Marks : 50

Note :—Attempt SIX questions in all. Q. No. 1 is COMPULSORY and carries 10 Marks. All other questions carry EQUAL marks.

1. Fill in the blanks :—

- (a) Specific gravity of iron is than that of silver.
- (b) Most important aspect of thread is its diameter.
- (c) Latent heat of fusion of ice is
- (d) Practical unit of current is
- (e) Metric horse power = kg. metre/sec.
- (f) Unit of force in CGS system is
- (g) Area of a triangle is $\frac{1}{2} \times \dots \times \dots$
- (h) One pound = grams.
- (i) A metric micrometer spindle screw has a pitch of
- (j) π radians = seconds.
2. (a) Define potential energy and kinetic energy.
- (b) Determine the kinetic energy of a mass of 1 kg. moving with a velocity of 150 cm/sec.
3. (a) What do you understand by velocity ratio, mechanical advantage and efficiency of a lifting system ?
- (b) A screw jack has a screw pitch of 6 mm and the length of operating lever is 30 cm. How much effort is required to lift a load of 200 N ?

4. (a) Define module and D. P. of a gear. Give examples.

- (b) A 150 mm dia (pitch dia) gear meshes with 50 mm dia (pitch dia) gear. If the larger gear has 30 teeth, find out the teeth of a smaller gear.

5. Solve :—

$$(a) \frac{6x+5}{4x+7} = \frac{3x+5}{2x+6}$$

- (b) With the help of logarithmic table find out the value of

$$\frac{5}{2} \times \sqrt{8} \times 18.35$$

6. Convert the following :—

(a) 93.5 BTU into CHU.

(b) 1630 square yards into square metres.

(c) 3.52 gallons into litres.

(d) 17° C into °F.

(e) 30 kmph into feet per minute.

7. A 30 × 40 cm steel plate has 52 drill holes of 1.5 cm dia each. Find out the area of remaining surface of the steel plate.

8. (a) Define stress, strain and Young's modulus of Elasticity. What are their units ?

(b) A steel wire 2 mm dia is loaded in tension with a weight of 20 kg. Find out the stress developed.