PAPER – II
DRAUGHTSMAN (CIVIL)/ DRAUGHTSMAN (MECHANICAL) / FITTER/ MACHINIST/
MACHINIST GRINDER/ MECH. AGRICULTURAL MACHINERY/ MECH. MACHINE
TOOL MAINTENANCE/ MECH. MOTOR VEHICLE/ MECHANIC REFRIGERATION &
AIR-CONDITIONING / OPERATOR ADVANCE MACHINE TOOL/ TOOL & DIE
MAKER (DIES & MOULDS)/ TOOL & DIE MAKER (PRESS, TOOLS, JIGS & FIXTURE)
/ TURNER / REFRACTORY TECHNICIAN
(WORKSHOP CALCULATION & SCIENCE)
SEMESTER – III

TIME: 3 HRS.
MARKS: 75

Note: Attempt all the questions.
All questions carry equal marks.
This paper carries negative marking. 25% marks will be deducted for each wrong
answer.

Choose the correct answer.

1. An isosceles triangle has :-
a. No sides equal           b. Two sides equal           c. Three sides equal           d. None of these

2. The width “L” of cut out circle which has diameter of Ø56 mm and width of 45 mm as
shown is:-

   ![Diagram]

   a. 45mm        b. 43.5mm       c. 44.5mm       d. 28mm

3. A train moving from rest attains a velocity of 10 meters per second in 5 seconds then its
acceleration is:-
a. 2 meters per sec²       b. 0.5 meters per sec²       c. 10 meters per sec²       d. 5 meters per sec²

4. Area of a sector of a circle whose radius is 14 cm and the length of the arc of the sector is 28
   cm is :-
a. 196 cm²       b. 1.0 cm²       c. 6.844 cm²       d. 3.50 cm²

contd....2/-
5. Area of a triangle whose sides are 3 cm, 4 cm and 5 cm is:
   a. 6 Sq cms  
   b. 7.5 Sq cms  
   c. 10 Sq cms  
   d. 8 Sq cms

6. A 150 meters long train will cross an electric pole with a speed of \( \frac{50}{3} \) M/Sec in:
   a. 12 seconds  
   b. 9 seconds  
   c. 20 seconds  
   d. 250 seconds

7. What is the angle of elevation of the sun when the shadow of a pole is \( \sqrt{3} \) times the shadow of the pole?
   a. 30°  
   b. 45°  
   c. 60°  
   d. None of these

8. In the diagram below of triangle ABC, AB=AC and if the base side angle “A” = 3 times X and the angle “B” = X + 20° then the value of angle X is:

   ![Diagram of triangle ABC with angles 3X°, 20°, and unknown angle X]

   a. 10°  
   b. 28°  
   c. 32°  
   d. 40°

9. Heat is closely related with:
   a. Liquids  
   b. Energy  
   c. Temperature  
   d. Entropy

10. The base of a prism is square having side of 10 cm. If its height is 8 cm, then the volume of prism is:
    a. 800 cm³  
    b. 850 cm³  
    c. 925 cm³  
    d. 700 cm³

11. Instrument used to measure temperature is:
    a. Barometer  
    b. Odometer  
    c. Thermometer  
    d. Speedometer

12. The cost of 10 cm and 20 cm long mild steel round will be (Density 7.8 gm/cm³) and rate
    is Rs. 40/kg (\(\pi=3.14\))—
    a. Rs. 600.34  
    b. Rs. 580.64  
    c. Rs 489.84  
    d. Rs. 450.50

13. If \( \frac{\sin \theta + \cos \theta}{\sin \theta - \cos \theta} = \frac{5}{4} \), the value of \( \tan^2 \theta + 1 \) is
    a. \( \frac{25}{16} \)  
    b. \( \frac{41}{9} \)  
    c. \( \frac{41}{40} \)  
    d. \( \frac{40}{41} \)

contd....3/-
14. The area of a trapezium is 384 cm². If the parallel sides are in the ratio of 3:5 and the perpendicular distance between them is 12 cm. The smaller of the parallel side is:
   a. 20 cm   b. 24 cm   c. 30 cm   d. 36 cm

15. Which diagram represents a correct constructional method of equilateral triangle ABC with the given side AB:

- Diagrams a, b, c, d -

16. When tensile stress is applied axially on a circular rod its i) diameter decreases  ii) length increases iii) volume decreases. Which of these are TRUE:
   a. Only (i)   b. Only (ii)   c. Both (i) and (ii)   d. All of these

17. A cast iron cylindrical hollow pipe has an external diameter of 20 cm. Its length is 35 cm and thickness of iron is 2 cm. What will be the volume of the metal used?
   a. 3960 C³   b. 4095C³   c. 3285 C³   d. 4200 cm³

18. The radius of one sphere is half of the other sphere. The volume of other sphere in respect to first sphere will be:
   a. Double   b. Eight times   c. Four times   d. None of these

19. The quantity of heat required to raise the temperature of 300 grams of copper(Sp heat 0.092 cal/gram) from 25°C to 75°C in K cal is:
   a. 138 K cals   b. 1.38 K cals   c. 207 K cals   d. 2.07 K cals.

20. If a tower height is 40 meters and when two persons observe the same in opposite direction at an angle of 30° and 60° respectively, then the distance between the persons is:
   a. 69.29 meters   b. 23.10 meters   c. 92.39 meters   d. 80 meters

- contd....4/-
21. The diagram shown below the construction of the bisector of angle ABC, which of the following statement is NOT true:

![Diagram of triangle ABC with bisector DF]

a. Angle EBF = $\frac{1}{2}$ angle ABC  
b. Angle DBF = $\frac{1}{2}$ angle ABC  
c. Angle EBF = angle ABC  
d. Angle DBF = angle EBF

22. Tensile strain is:

a. \[
\frac{\text{Increase in length}}{\text{Original length}}
\]

b. \[
\frac{\text{Decrease in length}}{\text{Original length}}
\]

c. \[
\frac{\text{Change in Volume}}{\text{Original length}}
\]

d. All of these

23. A vehicle moving on a horizontal road may be thrown outward due to:

a. Gravitational force  
b. Normal reaction  
c. Frictional force between tyres and road  
d. Lack of proper centripetal force.

24. For blanking a mild steel disc 60 mm diameter from a strip of 1.5 mm thick (shear stress is 40 kg/mm$^2$) the blanking pressure is:

a. 9 kg/mm$^2$  
b. 4 kg/mm$^2$  
c. 0.667 kg/mm$^2$  
d. 160 kg/mm$^2$

25. If a hole of 2 cm radius is drilled lengthwise throughout a cylinder of radius 6 cms and a height of 15 cms then the volume of cylinder after drilling is:

a. 1697 cc  
b. 1508.4 cc  
c. 377.14 cc  
d. 6034.285 cc

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