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

TIME: 3 HRS.  MARKS: 75

Note: Attempt all 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. In the crank mechanism of an engine. The length of crank AB is 6cm and connecting rod
is 24cm. From the triangle ABC, find out \( \angle BCA \). If the \( \angle BAC \) is 90\(^\circ\).
   a) 1420'  b) 15'  c) 18'  d) 21'

2. Name the material used for engine valve
   a) Steel Alloy  b) Gun Metal  c) Tungsten  d) Forged steel, steel alloy

3. The weight of a ball is 1.875 kg and volume is 250 c.c. calculate the density of the
material.
   a) 6.9 gm/cc  b) 7.3 gm/cc  c) 7.5 gm/cc  d) 7.40 gm/cc

4. 0.5 metre long bar of 30cm diameter has a density of 8 grams/cc. calculate the mass in kg.
   a) 20.4 Kg  b) 21.4 Kg  c) 22.3 Kg  d) None of these

5. Find the volume and weight of a metallic cone of diameter 14cm and height 10cm the
density of metal is 8 grams/cc.
   a) 514.33, 4.120  b) 515.33, 4.12  c) 513.33, 4.107  d) 518.33, 4.14

6. If weight of a spherical metal ball is 2 kg and radius is 30mm. find the density of the
material of the ball.
   a) 156.65 gm/cc  b) 16.68 gm/cc  c) 17.68 gm/cc  d) None of these

7. An aluminum rod is of 10cm diameter and 2 meter long. Specific gravity of aluminum is
2.8. Rate of aluminum is Rs 80 per kg. Calculate the cost of the aluminum rod.
   a) R 3520  b) R 3620  c) R 3821  d) R 3723

8. Find the price of copper rod 5cm diameter and 12 meter long. Specific gravity of copper
is 7.2 grams/cc. and the rate is Rs 70 per kg.
   a) 11888  b) 11880  c) 11885  d) 11880

Contd... 2/-
9. One mile is equal to
   a) 1.58 km  
   b) 1.76 km  
   c) 1.60 km  
   d) 1.6093 km

10. One tonne is equal to
   a) 1001 kg
   b) 1500 kg
   c) 1000 kg
   d) 2000 kg

11. Lathe bed is made of
   a) Mild steel
   b) Cast iron
   c) High carbon steel
   d) High alloy steel

12. With the following data:
    Tractor pulley: 24cm dia
    RPM: 1000
    Driven pulley rpm: 1500
    Find the diameter of thresh pulley.
       a) 14 cm
       b) 17 cm
       c) 18 cm
       d) 16 cm

13. With the following data:
    Gear of driven pulley: 40 teeth
    RPM of driving gear pulley: 200
    RPM of driving gear: 100
    Calculate the length of driving gear.
       a) 75 teeth
       b) 80 teeth
       c) 85 teeth
       d) 90 teeth

14. Solve: $\sqrt{0.000008281}$
    a) 0.091
    b) 0.0091
    c) 0.0091
    d) 0.91

15. In a piece of gun metal 22 parts of copper 2.5 parts of tin and 0.5 parts of lead is present.
    Find out the % of each metal in the gun metal
    a) Copper-88%, Tin-10%, Lead-2%
    b) Copper-78%, Tin-9%, Lead-3%
    c) Copper-85%, Tin-10%, Lead-5%
    d) Copper-80%, Tin-8%, Lead-2.5%

16. How many pieces of 12cmX10cm sizes can be cut from an aluminium sheet of 100cm x 150cm. Find out the area unused sheet. Calculate the percentage of wastage.
    a) 205N, 1000sqMM, 4%
    b) 200N, 1000sqMM, 3%
    c) 200N, 1000sqMM, 6%
    d) 200N, 1000sqMM, 5%

17. If the average of 3 numbers is 17 and that is first two are 16, the third number is
    a) 19
    b) 1
    c) 16
    d) 17

18. The bore and stroke of the four cylinders, Four strokes engine are 60mm and 80mm respectively. Find the air intake in 8 revolutions.
    a) 14480.25 cc
    b) 14479.20 cc
    c) 144488.28 cc
    d) 144482.286 cc

Contd...3/-
19. Number four cylinder engine having bore diameter of cylinder 60mm and stroke 210mm. Find total capacity in cubic cm?
a) 2276 cubic cm  
b) 2370 cubic cm  
c) 2270 cubic cm  
d) 2376 cubic cm

30. A 240 watt motor having resistance of its field coil 60 Ohm. What voltages require running the motor?
a) 122 volt  
b) 119 volt  
c) 120 volt  
d) 121 volt

33. One inch is equal to
a) 2.5 cm  
b) 2.54 cm  
c) 2.45 cm  
d) 2.6 cm

32. One unit of electricity is equal to
a) 1 kW-hr  
b) 100 W-hr  
c) 1 HP-hr  
d) 1 kW-60 hr

33. Unit of power is
a) Joule  
b) Watts  
c) Newton  
d) Kg-m

34. Unit of frequency is
a) RPM  
b) Hz (cycles/sec)  
c) Rev/sec  
d) Radians

35. Joules is equal to
a) N-m  
b) N-m/s  
c) Kg-m  
d) None of these