(J)

## PAPER – II
### (WORKSHOP CALCULATION & SCIENCE AND EMPLOYABILITY SKILLS)
### FOR ALL 10$^{TH}$ PASS ENGINEERING TRADES
### SEMESTER – II

TIME: 3 HRS.                                                           MARKS: 125

Note: This paper contains two parts – Part A & Part B.
      Attempt all the questions.
      All questions carry equal marks.
      This paper carries negative marking. 25 % marks will be deducted for each wrong answer.

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### PART – A (WORKSHOP CALCULATION & SCIENCE)    (MARKS: 75)

1.    What is the ratio of Cot θ -
    a) $\dfrac{1}{Sin\theta}$      b) $\dfrac{1}{Tan\theta}$      c) $\dfrac{1}{Cos\theta}$      d) $\dfrac{1}{Cosec\theta}$

2.    Which insulation has resistance to heat, oil ageing and water?
    a) Rubber                     b) Neoprene artificial rubber
    c) PVC                          d) Plastic

3.    Which one is a polynominal?
    a) 8 x y               b) 3x + 8         c) $2x^2 + 8x + 4$     d) $16x^2 + 7x^2 + 4x + 5$

4.    A voltage of 220 Volts is connected across a 1 K-ohms resistor as shown in the figure, then the power consumption of resistor is -



1 k ohms x ± 10%
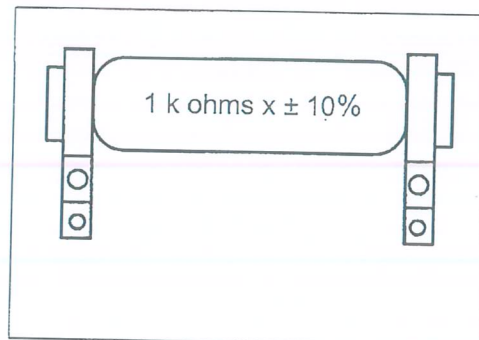
    a) 48.1 watts        b) 48.2 watts        c) 48.3 watts        d) 48.4 watts

5.    The quantity of heat which is required to raise the temperature of 1 gm of substance through 1° C is called as -
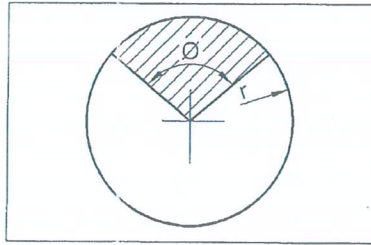    a) Latent heat       b) Specific heat       c) Melting point       d) Boiling point

6.  In an hexagonal prism shown in drawing given below, if L=30 cm and volume is 6378 cc, then its side length 'B' will be _____

    a) 6.045 cm
    b) 7.046 cm
    c) 8.046 cm
    d) 9.046 cm
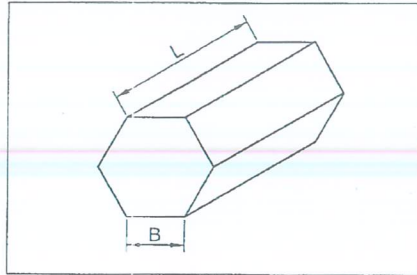
    

7.  Which formula is suitable for calculating the area of sector (shaped portion) in terms of radius (r) and included angle ($\phi$) -

    

    a) $2\pi r^2 \times \dfrac{\varnothing}{360^0}$     b) $\pi r^2 \times \dfrac{\varnothing}{360^0}$     c) $\dfrac{\pi r^2}{2} \times \dfrac{\varnothing}{360^0}$     d) $\dfrac{\pi r^2}{4} \times \dfrac{\varnothing}{360^0}$

8.  If a lamp is labeled as 250 W/5A, then its rated voltage will be -
    a) 50V     b) 100 V     c) 150 V     d) 250V

9.  If the area of a square wooden brick is 625 $cm^2$. Find the side of the wooden block -
    a) 45     b) 35     c) 25     d) 15

10. What is the unit of heat in SI unit?
    a) Celsius     b) Calorie     c) Joule     d) Fahrenheit

11. An effort of 25 kg is applied to a simple machine having velocity ratio of 4 and efficiency 15%. The mechanical advantage is -
    a) 1     b) 2     c) 3     d) 4

12. A rod 86 cm long is bent in the form of a rectangle such that its length is 7 cm greater than its breadth, Its length and breadth are _____ respectively.
    a) 14 cm, 21 cm     b) 12 cm, 19 cm     c) 16 cm, 23 cm     d) 18 cm, 25cm

13. The unit of velocity ratio (VR) is -
    a) $Kg/m^2$     b) kg-meter     c) NW-meter     d) No unit

14.  What is the value of one radian in degrees?
     a) 57.3°              b) 90°              c) 45°              d) 60°

15.  What is the equivalent of degree Fahrenheit for centigrade heat unit of 40°C?
     a) -40° F             b) + 72° F          c) 100° F           d) 87° F

16.  The lever shown below represents _____ type of lever.
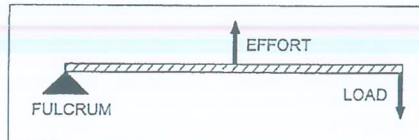


     a) 1$^{st}$ order     b) 2$^{nd}$ order   c) 3$^{rd}$ order   d) 4$^{th}$ order

17.  Efficiency of a machine is given by -

     a) $\dfrac{Mechanical\ advantage}{Velocity\ ratio}$        b) $\dfrac{Velocity\ ratio}{Mechanical\ Advantage}$

     c) $\dfrac{Effort}{Velocity\ ratio}$        d) None of these

18.  The formula for mechanical advantage in a simple machine is -

     a) $\dfrac{Effort}{Load}$        b) $\dfrac{Distance\ moved\ by\ Effort}{Distance\ moved\ by\ Load}$

     c) $\dfrac{Load}{Effort}$        d) $\dfrac{Distance\ moved\ by\ Load}{Distance\ moved\ by\ Effort}$

19.  Sin (A+B) is equal to -
     a) SinA CosA + Sin B Cos B        b) SinA CosB + CosA Sin B
     c) Cos A Sin B+ SinA CosB         d) CosA CosB + SinA SinB

20.  What is the equivalent resistance in the circuit shown, in which three 20Ω resistors each
     are connected in parallel -



     a) 10Ω                b) 30Ω              c) 60Ω              d) 90 Ω
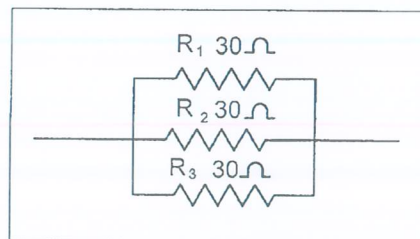
21. In any triangle if any two sides are equal, then the triangle is termed as -
    a) Right angled triangle          b) Isosceles triangle
    c) Equilateral triangle            d) Scalene triangle

22. $(a+b+c)^2$ is equal to -
    a) $a^2 + b^2 + c^2 + 2\,(ab + bc + ca)$      b) $a^2 + b^2 + c^2 + 2\,(a^2b + b^2c + c^2a$
    c) $a^2 + b^2 + c^2 + (ab + bc + ca)$        d) $a+b+c+a^2 b + b^2c + c^2a$

23. Which one of the following term is used to indicate the shaded portion in the circle given below ?
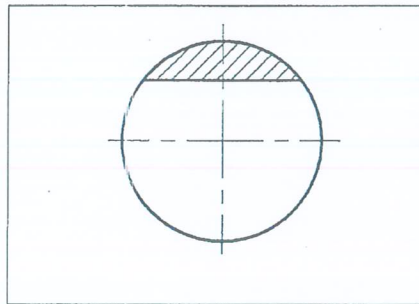


    a) Sector        b) Chord        c) Arc        d) Segment

24. What is the value of Tan 30° -
    a) $\sqrt{3}$        b) $\frac{1}{\sqrt{3}}$        c) 3        d) $\frac{2}{\sqrt{3}}$

25. Which one of the following is the correct equation to get the value of 'a' if $c^2 = a^2 + b^2$ -
    a) $a = c + b$      b) $a = \sqrt{c - b}$      c) $a = \sqrt{c^2 - b^2}$      d) $a = c^2 - b^2$

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