Venanta

HOT MODEL QUESTION SET-3

COMPULSORY MATHEMATICS

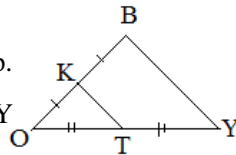Class: IX   Time: 3:00 hours   Max. Marks: 100

Attempt all **the** questions:

Group-A   [3× (1+1) = 6]

1. a) If the marked price of an article is Rs. x and discount amount is Rs. y find the rate of discount.

 b) Write down the Heron's formula of calculating the area of triangle whose sides are a cm, b cm and c cm.

2. a) If $(a^m \times a^n) \div a^p = a^x$ then express x in terms of m, n and p.

  b) In ΔBOY; K and T are the mid-points of sides OB and OY respectively. Write the relation between KT and BY.

3. a) In the figure given alongside; O is the centre of circle. If OP ⊥ AB, write the relation between AP and AB.
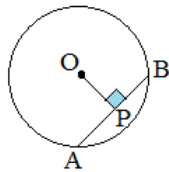
  b) In the adjoining histogram, the number of students against the obtained marks in mathematics in a Knack Test. How many students are there who secured more than 60 marks?
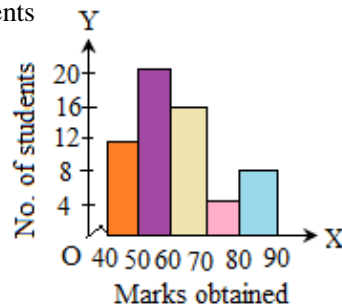
## Group-B   [4 × (2 + 2) +3 × (2 + 2 + 2) = 34]

4. a) A noodle factory made a profit of Rs. 2000000 in the last year. If the management decided to distribute 20% bonus from the profit to its 50 employees equally, find the bonus amount received by each employee.

  b) The minimum charge up to 175 calls is Rs. 200. If the charge for each additional call is Rs. 2, how much will be the charge for 350 calls with 10 % telephone service charge (TSC)?

5. a) A path of width 5 m runs within a squared park of side 50 m, find the area of the path.

  b) Find the total surface area of a cube recast by melting three smaller metallic cubes of sides 3cm, 4cm and 5cm.

  c) A rectangular carton is 80 cm × 60 cm × 40 cm. How many packets of soaps each of 10 cm × 5 cm × 4 cm can be kept inside the carton? Find.

6. a) Factorize: $x^4 + 4$

  b) Simplify: $\sqrt[a+b]{\dfrac{x^{a^2}}{x^{b^2}}} \times \sqrt[b+c]{\dfrac{x^{b^2}}{x^{c^2}}} \times \sqrt[c+a]{\dfrac{x^{c^2}}{x^{a^2}}}$
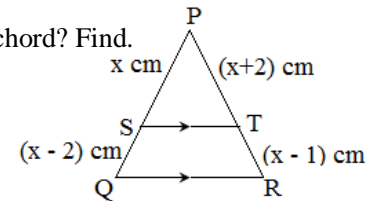
7. a) Solve: $2^{3x-5} \times a^{x-2} = 2^{x-2} \times a^{1-x}$

  b) Solve: $y = 3x$ and $x + 2y = 56$.

  c) If $\dfrac{a}{b} = \dfrac{b}{c}$ then prove that: $\dfrac{a}{a+b} = \dfrac{a-b}{a-c}$

8. a) In the given figure, ABCD is a square and EBC is an equilateral triangle, find the value of x and y.
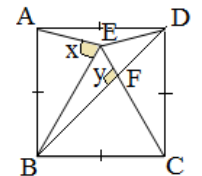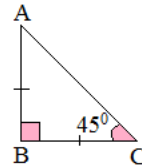

  b) The radius of a circle is 10 cm and the distance of a chord is at a distance of 4cm from the centre. What is the length of the chord? Find.

  c) In the adjoining figure; ΔPQR ~ΔPST. Find the value of x.

9. a) In isosceles right angled triangle ABC, $\angle ABC = 90^0$ and

AB = BC. Show that: $\sin 45^0 = \dfrac{1}{\sqrt{2}}$

b) Find the first quartile from the data given below:

5kg, 12kg, 33kg, 56kg, 24kg, 15kg, 74kg

10. a) In class 9 of a school, out of 40 students 5 boys and 3 girls wear spectacles. If a student is to be selected at random for the post of class captain. What is the probability of selecting a student wearing spectacles for the post?

b) A number card is drawn at random from the group of number cards numbered from 1 to 20. Find the probability that the card may be prime number or cube number.

Group-C   (10 × 4 = 40)

11. In a group of 125 students, the ratio of student who like tea to the number of students who like coffee is 4:5.If 20 of them like both the drinks and 10 of them like none of them then find:
(i)   How many of them like only one drink?
(ii)   Draw a Venn-diagram to represent the above information.

12. After allowing 20% discount on the marked price of a bicycle, a customer paid Rs. 9944 with 13% value added tax. How much amount of discount was given? Find.

13. Find the volume, LSA and TSA of the given prism.
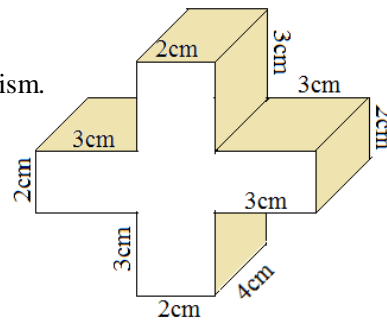
14. If a, b, c and d are in continued proportion, prove that:

15. Simplify: $\dfrac{1}{1+x^{l-m}+x^{n-m}} + \dfrac{1}{1+x^{m-n}+x^{l-n}} + \dfrac{1}{1+x^{n-l}+x^{m-l}} = 1$

16. Prove that the diagonals of parallelogram bisect to each other.

17. Explore experimentally the relation between the line segment joining the mid-points of any two sides of a triangle and its third side. (Two figures of different measurements are necessary)

18. Construct a trapezium ABCD in which AB = 4.5cm, BC = 5cm, $\angle BAD = 60^0$, $\angle BAD = 90^0$ and AD // BC.

19. Prove that: $\dfrac{1-\sin 30^0}{1+\cos 30^0} = \dfrac{1-\tan 30^0}{1+\tan 30^0}$

20. If the mean of the data given below is 17 and the sum of the frequencies is 40, find the value of 'a' and 'b'.

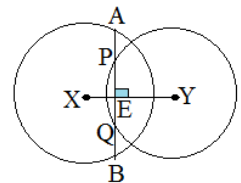| x	5	10	15	20	25	30
f	2	a	10	7	b	2

Group-D   (4 × 5 = 20)

21. The monthly salary of a married manager of an office in 2075 BS is Rs. 88000 and 10% of his salary is deducted as Employees Provident Fund (EPF) and another 10% is deducted as Citizen Investment Trust (CIT). If 1% Social Security Tax (SST) is levied up to the annual income of Rs. 4,50,000, 15% lax is levied on Rs. 4,50,000 to Rs. 550000 and 25% tax above Rs. 5,50,000, how much income tax should he pay in this year? Find.

22. A temple has a rectangular base 20 m long and 10 m broad. A path 1 m wide surrounding the temple is to be paved by marbles each of size 250 sq. cm. If the cist of each marble is Rs. 75, find the cost of paving the marbles.

23. Solve: $\dfrac{x+2}{x-2} - \dfrac{x-2}{x+2} = 4\dfrac{4}{5}$

24. In the figure alongside, X and Y are the centers of two intersecting circles. If AB intersect XY perpendicularly at E, prove that:

(i)   AP = BQ   (ii)   AQ = BP

THE END