MODEL QUESTION PAPER – 4

I.   Four alternatives are given for each of the following questions / incomplete statements. Only one of them is correct or most appropriate. Choose the correct alternative and write the complete answer along with its letter of alphabet.
$8 \times 1 = 8$

1. The least number that is divisible by all the numbers from 1 to 5 is:

    (A) 70   (B) 60   (C) 80   (D) 90

2. If $3 \tan \theta = \sqrt{3}$ then $\theta =$

    (A) 30^0 (B) 60^0 (C) 45^0 (D) 90^0

3. The distance between two parallel tangents of a circle of radius 3 cm is

    (A) 2 cm   (B) 4 cm   (C) 6 cm   (D) 8 cm

4. The slant height of a cone having radius 5cm and height 12 cm is

    (A) 6 cm   (B) 9 cm   (C) 11 cm   (D) 13 cm

5. A quadratic polynomial, whose zeroes are –3 and 4, is

    (A) $x^2 - x + 12$ (B) $x^2 + x + 12$ (C) $(x^2/2) - (x/2) - 6$ (D) $2x^2 + 2x - 24$

6. In an A.P the relation between a_5 and a_7 and common difference (d) is

    (A) $a_5 = a_7 + 2d$ (B) $a_5 = a_7 + d$ (C) $a_7 = a_5 + 3d$ (D) $a_7 = a_5 + 2d$

7. D and E are respectively the points on the sides AB and AC of a triangle ABC such that AD=2cm, BD= 3cm, BC=7.5cm and DE ‖ BC. Then length of DE is

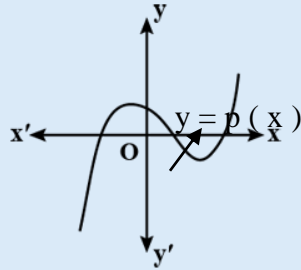   (A) 2.5cm   (B) 3cm   (C) 5cm   (D) 6cm

8. A fish tank has 5 male fish and 8 female fish. The probability of fish taken out is a male fish:

    (A) 5/8   (B) 5/13   (C) 13/5   (D) 5

II. Answer the following: **8 X 1 = 8**

9. The following graph represents the polynomial $y = p(x)$. Write the number of zeroes that

p (x) has

10. Find the value for $'c'$ for which the equation $ax^2 + bx + c = 0$ has equal roots.

11. Write the formula to find the sum of the first 'n' terms of an arithmetic progression whose first

term is 'a' and the last term is 'a_n'.

12. Areas of two similar triangles are $81cm^2$ and $16cm^2$ respectively. Find the ratio of their

corresponding sides.

13. Express 98 as a product of its primes.

14. Find the value of $(1 + tan^2 \theta) cos^2 \theta$

15. Given that $\sin \theta = \frac{a}{b}$, then find the value of $\tan \theta$

16. Volume and surface area of a solid hemisphere are numerically equal. What is the diameter of

hemisphere?

III. Answer the following: **8 X 2 = 16**

17. Find the HCF of 65 and 117 and find a pair of integral values of m and n such that

HCF $= 65m + 117n$.

18. Solve : $y - 4x = 1$ and $6x - 5y = 9$

19. Solve by using quadratic formula $2x^2 - 5x + 3 = 0$

20. Find the value of k, for which the points A (8, 1), B (k, -4) and C (2, -5) are collinear.

21. ΔABC is an isosceles triangle in which AB = BC. If AB^2 = 2AC^2 then prove that ΔABC is right triangle

OR

Two triangles ABC and DBC lie on the same side of the base BC. From a point P on BC, PQ‖AB and PR‖BD are drawn. They meet AC in Q and DC in R respectively. Prove that QR‖AD.
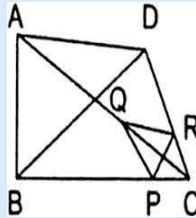
22. A bag contains 15 white and some black balls. If the probability of drawing a black ball from the bag is thrice that of drawing a white ball, find the number of black balls in the bag.

23. Draw a pair of tangents to a circle of radius 3·5 cm which are inclined to each other at an angle of 60°.

24. If A + B = 90^0, prove that $\sqrt{\dfrac{\tan A.\tan B + \tan A.\cot B}{\sin A.\sec B} - \dfrac{\sin^2 B}{\cos^2 A}}$ = tan A

OR

Solve the equation for θ if $\dfrac{\cos^2 \theta}{\cot^2 \theta - \cos^2 \theta} = 3$

IV. Answer the following: 9 X 3 = 27

25. Five years hence, the age of Jacob will be three times that of his son. Five years ago, Jacob's age was seven times that of his son. What are their present ages?

OR

Yash scored 40 marks in a test, getting 3 marks for each right answer and losing 1 mark for each wrong answer. Had 4 marks been awarded for each correct answer and 2 marks

been deducted for each incorrect answer, then Y ash would have scored 50 marks. How

many questions were there in the test?

26. If $\sqrt{5}$ and $-\sqrt{5}$ are the two zeros of the polynomial $p(x) = x^4 + 4x^3 - 2x^2 - 20x - 15$, then

find remaining zeros of the polynomial

27. A train travels 360 km at a uniform speed. If the speed had been 5 km/h more, it would

have taken 1 hour less for the same journey. Find the speed of the train.

OR

If roots of the equation $(a-b) x^2 + (b-c) x + (c-a) = 0$ are equal, prove that $2 a = b + c$.

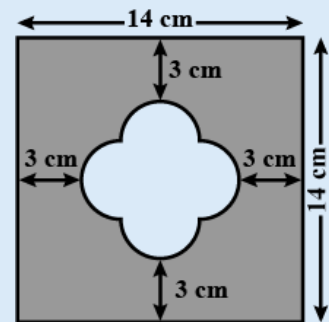28. Find the point on the x-axis which is equidistant from $(2, -5)$ and $(-2, 9)$.

OR

Find the ratio in which the line segment joining A $(1, -5)$ and B $(-4, 5)$ is divided by

the x-axis. Also, find the coordinates of the point of division.
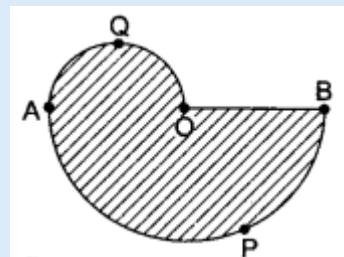
29. Prove that "the lengths of tangents drawn from an external point to a circle are equal".

30. In figure, find the area of the shaded region [use $\pi = 3.14$]

OR

In figure, APB and AQO are semicircle, and AO = OB. If the perimeter of the figure is 40 cm,
find the area of the shaded region.

31. Draw less than type ogive for the following distribution.

C lass Interval	Frequency
50-55	2
55-60	8
60-65	12
65-70	24
70-75	38
75-80	16

32. Find median for the following data

C - I	0-20	20-40	40-60	60-80	80-100	100-120
f	6	8	10	12	6	5

33. Construct a triangle of sides 4cm, 5cm and 6cm then construct another triangle

whose corresponding sides are 3/5 of the sides of the first triangle.

V. Answer the following: **4 X 4 = 16**

34. Find the solution of the following pairs of linear equation by the graphical method:

$$x + 2y = 5$$

$$2x - 3y = -4$$

35. If the ratio of the sum of the first m and n terms of an AP is $m^2 : n^2$. Show that the ratio

of it's m^{th} and n^{th} terms is (2m -1): (2n -1)

OR

If pth, qth and rth term of an AP are a, b, c respectively, then show that $(a-b)r+(b-c)p+(c-a)q=0$

36. A straight highway leads to the foot of a tower. A man standing at the top of the tower observes

a car at an angle of depression of 30°, which is approaching the foot of the tower with a

uniform speed. Six seconds later, the angle of depression of the car is found to be 60°. Find the

time taken by the car to reach the foot of the tower from this point.

37. Prove that, If in two triangles, corresponding angles are equal, then their corresponding sides

are in the same ratio and hence two triangles are similar.

VI. Answer the following: **5 X 1 = 5**

38. Due to heavy floods in a state, thousands were rendered homeless. 50 schools collectively

offered   to the state government to provide place and the canvas for 1500 tents to be fixed by

the government and decided to share the whole expenditure equally. The lower part of each

tent is cylindrical of base radius 2.8 m and height 3.5 m, with conical upper part of same base

radius but of height 2.1 m. If the canvas used to make the tents costs Rs 120 per sq. m, find

the amount shared by each school to set up the tents. [use $\pi = \frac{22}{7}$]

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