TECHNO MISSION SCHOOL

Samastipur-848101

Class- Std IX
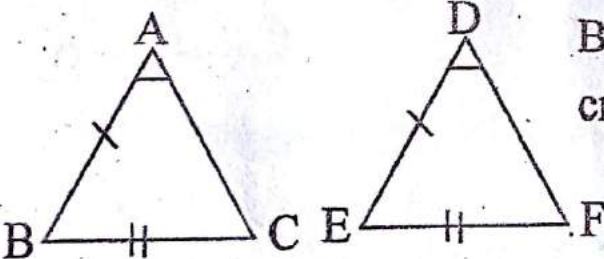**Subject- Mathematics**

Time- 3 Hours
F.M.- 80

General Instructions :

1. All questions are compulsory.
2. The questions paper consists of 30 questions divided into four sections A, B, C and D
3. Section 'A' comprises 6 questions 1 mark each.
   Section 'B' comprises 6 questions 2 marks each.
   Section 'C' comprises 10 questions 3 marks each.
   Section 'D' comprises 8 questions 4 marks each.
4. Use of calculator is not permitted.
5. Figures in the margin indicate marks of each question.

Section - A

1. What will be the simplest form of $0.2\overline{45}$?

2. Find the remainder when the polynomial $f(x)$ is divided by $(x+3)$. $= x^2+5x+6$

3. In which axis/quadrant $(0,5)$ will lie?

4. Convert 5 cm^2 into Km^2.

5. Both $\triangle$s are congruent by which criteria for congruence of triangles?

6. Prove that if one side of a triangle is produced, the exterior angle so formed equals to sum of its opposite interior angles.

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Section - B

7. A coin is tossed 500 times and we get head 285 times, tail 215 times. When a coin is tossed at random, what is the probability of getting (i) a head? (ii).a tail?

8. The following data gives the number of children in 20 families.
5, 2, 3, 3, 1, 2, 2, 4, 2, 5, 4, 1, 1, 2, 3, 4, 1, 1, 2, 3
Make an array of the above data and construct a frquency table.

9. A taxi charges Rs. 20 for the first Km. and @ Rs. 12 per km. for subsequent distance covered. Taking the distance covered as x km. and total fare Rs. y write a linear equation depicting the relation in x and y.

10. If 'O' is a point within a quadrilateral ABCD, prove that $OA + OB + OC + OD > AC + BD$

11. Prove that the perpendicular from the centre of a circle to a chord bisects the chord.

12. In the adjoining figure, prove that ABCD is a parallelogram. Calcutate the area of " gm. ABCD, if DC = 5 cm., BD = 7 cm. and AB = 5 cm.
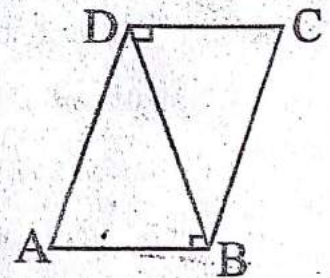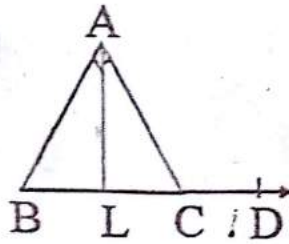
Section - C

13. If $x = 2y + 6$, find the value of $x^3 - 8y^3 - 36xy - 216$

14. If $x = (5 + 2\sqrt{6})$, prove that $\left(\sqrt{x} + \dfrac{1}{\sqrt{x}}\right) = \pm 2\sqrt{3}$

15. The side BC of a △ABC is produced to D. The bisector of ∠A meets

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BC in L. Prove that $\angle ABC + \angle ACD = 2\angle ALC$

16. The difference between the semi perimeter and the sides of a $\triangle ABC$ are 8 cm., 7 cm. and 5 cm. respectively. Find the area of the $\triangle$

17. Two circles of radii 5 cm. and 3 cm. intersect at two points and the distance between their centres is 4 cm. Find the length of the common chord.

18. Triangle ABC is in such a way that 'D' is the mid point of BC and 'E' is the mid point of AD.
Prove that

$$ar (\triangle BED) = \frac{1}{4} (ar. \triangle ABC)$$
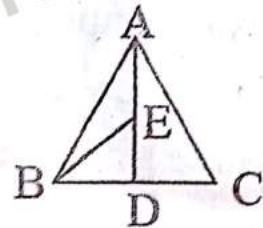
19. The curved surface area and the volume of a pillar are 264 m² and 396 m³ respectively. Find the diameter and the height of the pillar.

20. In the adjoining figure, ABCD is a trapezium in which AB∥DC and 'E' is the mid point of AD. A line segment EF∥AB meets BC at F. Prove that F is the mid point of BC.
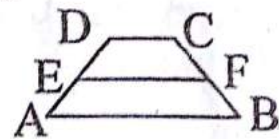
21. A river 3 m deep and 40 m wide is flowing at the rate of 2 km./hr. How much water will fall into the sea in a minute?

22. In the given figure AB is a chord of a circle with centre 'O' and AB is produced to 'C' such that BC = OB. Also CO is joined and produced to meet the circle in D. If $\angle ACD = y°$ and $\angle AOD = x°$, prove that $x = 3y$
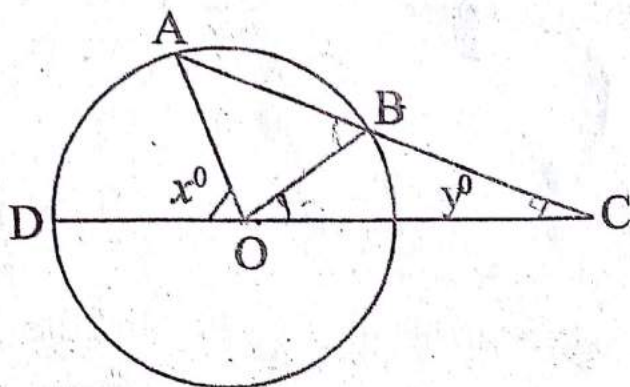
Section - D

23. Construct a triangle ABC in which

    $\angle B = 60^{\circ}, \angle C = 45^{\circ}$

    $AB + BC + CA = 11 cm.$

24. Using empirical formula, calculate the mode of the following data.

    23, 25, 28, 25, 16, 23, 17, 22, 23, 25

25. Three girls Reshma, Salma, and Mandip are playing a game by standing on a circle of radii 5 cm. drawn in a park. Reshma throws a ball to Salma, Salma to Mandip, Mandip to Reshma. If the distance between Reshma and Salma and b/w Salma and Mandip is 6 m. each, what is the distance b/w Reshma and Mandip?

26. The base BC of $\triangle ABC$ is divided at 'D' such that $BD = \frac{1}{2}DC$.

    Prove that ar.$(\triangle ABD) = \frac{1}{3}$ ar.$(\triangle ABC)$

27. Factorise:-

    (i) $8x^3 - 8x^2 - 9$

    (ii) $(x+1)(x+2)(x+3)(x+4) - 3$

28. Let ABC be a triangle right -angled at B and D be the mid point of AC. Solve that $DA = DB = DC$

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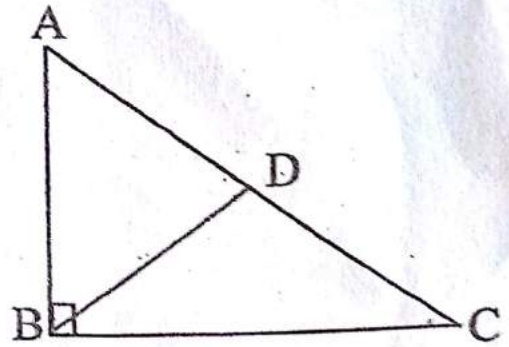
29. A cylindrical metallic pipe is 14 cm. long. The difference b/w the outside and inside surface is 44 cm². If the pipe is made up of 99 cm³ of metal, find the outer and inner radii of the pipe.

30. Draw the graph of the equation $3x + 2y = 12$. At what points does the graph cut the X-axis and the Y-axis ?