SUBJECT : MATHEMATICS

Time : 3 hrs.   M.M. : 80

General Instructions :

(i)   *All questions are compulsory.*

(ii)   *Read all questions very carefully.*

(iii) *Questions 1 to 10 carry 1 mark each.*

(iv)   *Questions 11 to 18 carry 2 marks each.*

(v)   *Questions 19 to 28 carry 3 marks each.*

(vi)   *Questions 29 to 34 carry 4 marks each.*

Q1. After rotating by $120°$ about a centre, a figure looks exactly the same as its original position. At what other angles will this happen for the figure?

Q2. The following are the temperatures in degree Celsius at 5 p.m. for 7 days in Delhi

20, 23, 25, 21, 20 22, 23

Find the range of the temperature in the above data.

Q3. Diameter of the Earth is 1,27,56,000m. Express this number in standard form.

Q4. 5 bowls cost ₹ 90. What would be the cost of 15 such bowls?

Q5. Write the algebraic expression for the given statement :

Numbers a and b both squared and added.

Q6. Find the value of $(-1)^{27}$.

Q7. How many diagonals can be drawn from a vertex in a polygon having 7 sides?

Q8. Give first the step you will use to separate the variable and then solve the equation :

$$x - 2 = 2$$

Q9. Find the value of : 16% of 25.

Q10. By applying ASA Congruence rule, it is to be established that $\triangle ABC \equiv \triangle QRP$ and it is given that BC = RP. What additional information is needed to establish the congruence?

Q27. Mohit bought a cycle for ₹ 1850. He sold it to Dinesh at a profit of 8%. Find the selling price of the cycle.

Q28. Construct a $\triangle ABC$ in which AB = 5.6cm, AC = 4.3cm and $\angle A = 90°$. Also write steps of construction.

Q29. The following table shows the number of girls and boys of a class who take part in different sports activities.

Sport	Hockey	Basketball	Badminton	Volleyball
No. of girls	12	24	16	10
No. of boys	20	22	12	6

(a) Draw a double bar graph to represent the above data.

(b) Which sport is most popular among the students?

(c) In how many sports, more number of girls take part than the number of boys?

(d) What do you think, sports are important for our development or it is just a waste of time and energy?

Q30. (a) Construct two equations starting with $x = -6$.

(b) Check whether the value given in the bracket is a solution to the given equation or not :

(i) $3p + 4 = 25$ (p = 7)

(ii) $\dfrac{3m}{5} + 2 = 6$ (m = -10)

Q31. (a) Simplify and find the value if m = -1

$$m^2 + 2m - (5m + 4)$$

(b) What should be the value of p, if the value of $3x^2 - 2x + p$ equals 3, when x = 1.

Q32. (a) Identify the greater number : 2^4 or 4^3

(b) Find the ratio of

(i)   200g to 2kg

(ii) 75 paise to ₹ 6

Q33. A sum of ₹ 2500 is lent for 2 years at the rate of 5% per annum. Find the interest and the amount.

Q34. Construct a $\triangle XYZ$ in which XY = 6cm, $\angle Y = 60°$ and $\angle Z = 75°$.

Q11. Solve the following equation by trial and error method

$$20 - x = 16$$

Q12. Identify terms which contain a^2 and give the coefficient of a^2.

(a) $\quad - 2a^2 + b^2$

(b) $\quad \dfrac{3}{4}b^2 + \dfrac{1}{4}c^2 + \dfrac{5}{4}a^2$

Q13. Express 216 as product of powers of its prime factors.

Q14. A bag contains 6 yellow balls, 2 red balls and 5 green balls. A ball is drawn without looking into the bag. What is the probability of getting :

(a) a green ball,

(b) a red ball?

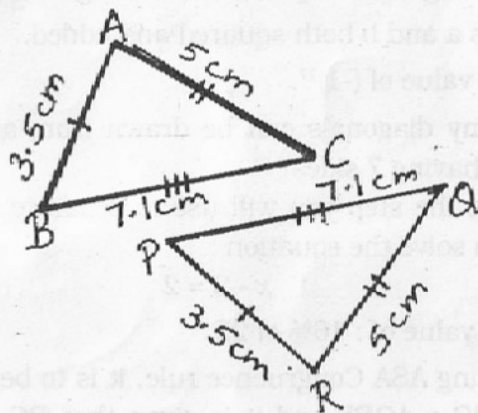Q15. Show the terms and factors by tree diagrams :

$6xy - 4x^2 - y^2 + 5$

Q16. A school team won 20 games this year against 16 games won last year. What is the percent increase?

Q17. In given figure, $\triangle ABC$ and $\triangle PQR$, lengths of sides are indicated.

(a) State the three pairs of equal parts in two triangles.

(b) Write the congruence relation in symbolic form.

Q18. Draw a line segment PQ = 4cm. Take a point X outside PQ and draw a line parallel to PQ and passing through the point X.

Q19. (a) What is the order and angle of rotation of a
(i) rhombus (ii) square?

(b) Write any two letters of the English alphabet which have reflectional symmetry about both horizontal and vertical mirrors.

Q20. Solve the following equation and check your answer :

$$10 - 3(x + 4) = 25$$

Q21. Arush scored the following marks in various class tests, each test being marked out of 10 marks.

5, 7, 6, 5, 7, 5, 3, 4, 3

(a) What are the mean marks?

(b) What is the median of the given marks?

(c) What is the mode of the given marks?

Q22. The cost of a book is ₹ 25 more than two-third the cost of geometry box. If the cost of book is ₹ 125, find the cost of the geometry box.

Q23. Simplify : $\dfrac{2 \times 3^4 \times 2^5}{9 \times 4^2 \times 8^0}$

Q24. From the sum of $2a^2 + 3ab$ and $-a^2 - ab - b^2$, subtract $3a^2 - b^2$.

Q25. In a fruit godown 800 kg apples are stored. If 27% of them are defective, how much fruit is good?

Q26. In given fig, $\overline{AB}$ and $\overline{CD}$ bisect each other at point O.
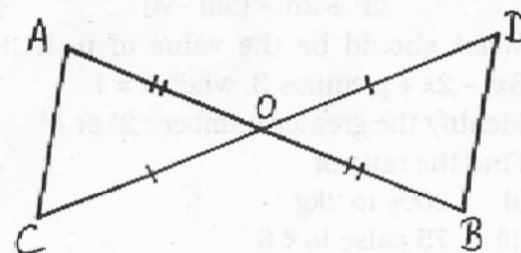
(a) State the three pairs of equal parts in triangles AOC and BOD.

(b) Is $\triangle BOD \cong \triangle AOC$? Give reason.

(c) Is AC = BD? Justify your answer.