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**R. D. RAJPAL SCHOOL**  
**MID TERM EXAM (2017-18)**

**CLASS - IX**  
**Time Allowed: 3 Hours**

**SUBJECT - MATHS, SET - B**  
**Max Marks: 80**

**General Instructions:**

1. All questions are compulsory.
2. The question paper consist of 30 questions divided into 4 sections - A, B, C and D. **Section A comprises of 6 questions of one mark each, Section B comprises of 6 questions (7-12) of two marks each, Section C comprises of 10 questions (13-22) of three marks each and Section D comprises of 8 questions (23-30) of four marks each.**
3. Rough work must be shown on right hand side of the answer.

**SECTION - A**

- 1) Write the value of  $-\sqrt[3]{7} \times \sqrt[3]{49}$
- 2) Evaluate  $97 \times 97$  using identities.
- 3) Name the point of intersection of coordinate axes.
- 4) How many lines can be drawn through a given point?
- 5) Write the supplement of an angle of measure  $2x^\circ$ .
- 6) Of the three angles of a triangle one is twice the smallest and another is three times the smallest. Find the angles.

**SECTION - B**

- 7) The perimeter of a triangular field is 54 m. If its sides are in the ratio 25 : 17 : 12, find the area of the triangle.
- 8) In a parallelogram ABCD,  $\angle D = 75^\circ$ . Find  $\angle A$  and  $\angle B$ .
- 9) If  $a + b = 10$ ,  $ab = 21$ , find value of  $a^3 + b^3$ .
- 10) Write the value of  $(48^3 - 30^3) - 18^3$ .

11) Find the area of triangle formed by the points A (0,1), B (0,5) and C (3,4).

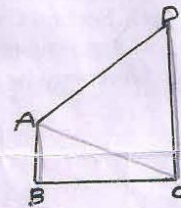
12) In the figure, If  $AC=BD$ , then prove that  $AB = CD$ .



SECTION - C

13) If ray OC stands on a line AB such that  $\angle AOC = \angle COB$ , then show that  $\angle AOC = 90^\circ$ .

14) AB and CD are respectively the smallest and longest sides of a quadrilateral ABCD. Show that  $\angle B > \angle D$ .



15) Find the area of an equilateral triangle having each side of 8 cm.

16) The angles of a quadrilateral are in the ratio 1:2:4:5. Find the measure of all the angles.

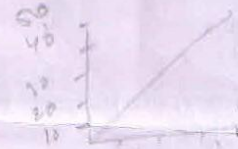
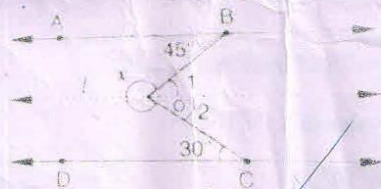
17) Find six rational numbers between 4 and 5.

18) If  $x^2 - 1$  is a factor of  $ax^4 + bx^3 + cx^2 + dx + e$ . Show that  $a + c + e = b + d = 0$

19) Give the equations of two lines passing through (3, 12). How many more such lines are there?

20) Komal was driving a car with uniform speed 50 km/hour. Draw distance-time graph. From the graph, find the distance travelled by Komal in  $3\frac{1}{2}$  hours.

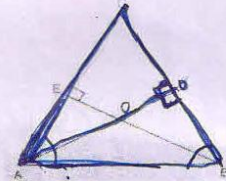
21) In the given figure,  $AB \parallel CD$ . Find the value of  $\angle x$ .



$x + y = 0$



- 22) In the given figure, AD and BE are respectively altitudes of an isosceles  $\Delta ABC$  such that  $AC = BC$ . Prove that  $AE = BD$ .



**SECTION - D**

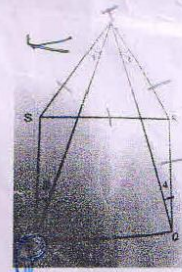
- 23) Draw the graph of the following linear equations on the same axes  $x + y = 3$ ,  $3x - 2y = 4$ . Also shade the region formed by their graphs and Y axis.

- 24) Prove that diagonals of a parallelogram bisect each other.

- 25) If  $x = \frac{\sqrt{5}-2}{\sqrt{5}+2}$ , then prove that  $x^4 + \frac{1}{x^4}$  is an integer.

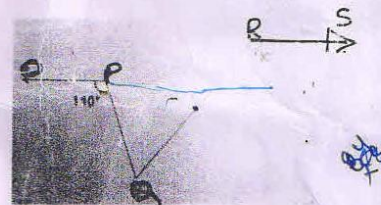
- 26) The polynomial  $p(x) = x^4 - 2x^3 + 3x^2 - ax + 3a - 7$  when divided by  $x + 1$  leaves remainder 19. Find the value of  $a$ . Also find the remainder when  $p(x)$  is divided by  $x - 2$ .

- 27) In the given figure, PQRS is a square and SRT is an equilateral triangle. Prove that  $PT = QT$  and  $\angle TQR = 15^\circ$ .



- 28) Show that if the diagonals of a quadrilateral are equal and bisect each other at right angles, then it is a square.

- 29) In the given figure, if  $OP \parallel RS$ ,  $\angle OPQ = 110^\circ$  and  $\angle QRS = 130^\circ$ , then determine  $\angle PQR$ .



- 30) Two parallel sides of a trapezium are 25cm and 13cm and other two sides are 15cm and 15cm. Find the area of the trapezium.

