QUARTERLY EXAMINATION-2017-2018
MATHEMATICS

Time : 2.5hrs   Class - IX Std   MM. 90

SECTION A (40 Marks)

Note : Do all sums.

Q-1. (a). Express 5.2 in the form of $\frac{P}{q}$ where P and q are both integers and $q \neq 0$.   ③

(b). Rationalise the following $\frac{4\sqrt{3}}{\sqrt{6}+\sqrt{2}}$ 3

(c). Find the amount and compound interest on Rs. 16000 for $1\frac{1}{2}$ years at 10% per annum, the interest being compounded half yearly.   4

Q-2. (a). Factorise $a^2 + b^2 - 2(ab+bc - ac)$ ③

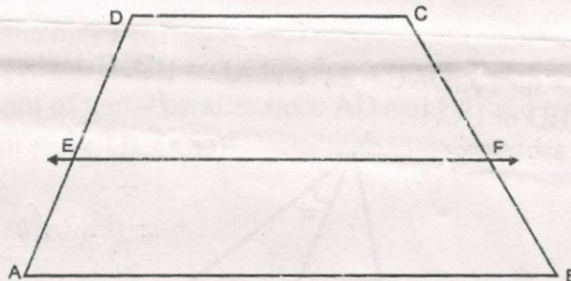(b). If $x + y = 8$ and $xy = 3\frac{3}{4}$, find the value of $3(x^2 + y^2)$.   3

(c). AB is line segment and l is its perpendicular bisector, If P is a point on l, show that P is equidistant from A and B.   4

Q-3. (a). In the adjoining figure ABCD is a trapezium in which AB // DC and E is mid-point of AD. A line is drawn through E parallel to AB intersecting BC at F. Show that F is mid point of BC.   3

(b). In $\triangle$ ABC, right angled at B, AB = 24 cm and BC = 7 cm. Determine Sin C, Cos C.   3

(c). If tan $\square$ = $\frac{1}{\sqrt{5}}$ find the value of $\frac{Cosec^2 \theta - Sec^2 \theta}{Cosec^2 \theta + Sec^2 \theta}$ 4

Q-4. (a). Using suitable identity evaluate $(10.3)^2$.   3

(b). If $a^2 + 4a + x = (a+2)^2$ find the value of X.   3

(c). If O is any point in the interior of a rectangle ABCD prove that
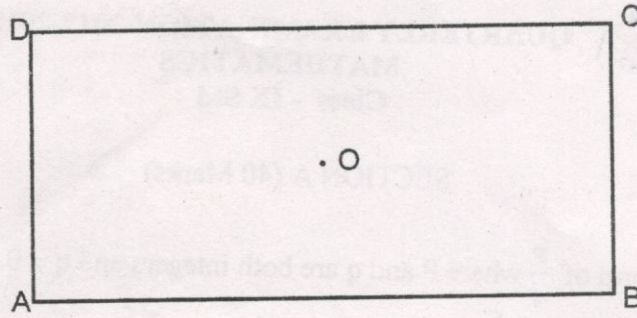$$OA^2 + OC^2 = OB^2 + OD^2$$
Hence find the length of OD, if the length of OA, OB and OC are 3 cm, 4 cm and 5 cm respectively.   ④

⑤ Prove that the △ form by joining the M.P of ed are congruent to each other.

P.T.O

Q.5 (a) By factor theorem, show that (x+3) and (2x -1) are the factor of $2x^2+5x+3$. **3**
(b) Show that (2x +1) is a factor of 4x3 +12x2+11x +3 Hence factorise $4x^2+12x^2+11x+3$ **3**
(c) If (x+3) & (x_4) are factors of $x^2-ax^2-bx+24$, find the value of a & b with these value of a & b factorise the given expression. **4**
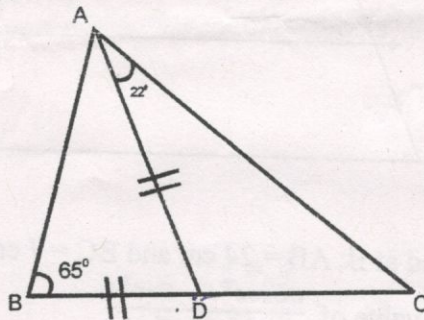
SECTION B (40 Marks)

Note : Do any four sums.

Q-5.   (a). Given A is an acute angle and 13 Sin A = 5, evaluate

$$\frac{5SinA-2CosA}{tan A}$$ **3**

(b). In $\triangle$ ABC , $\angle$ ABD = 65^0, $\angle$ DAC = 22^0 and AD = BD. Calculate $\angle$ ACD and state giving reasons which is greater BD or DC. **3**

(c). What sum will amount to Rs. 2782.50 in 2 years at compound interest if the rates are 5% and 6% for the successive years. **4**

Q-6. (a). If $\sqrt{3}$ = 1.732 find the value of
$\sqrt{27} - 3\sqrt{75} + 5\sqrt{48}$ **3**

(b). The present population of a village is 5408. If it has increased at the rate of 4% every year what was its population two years ago. **3**

(c).   If the sum of two numbers is 7 and the sum of their cubes is 133. Find the sum of their cubes 133, find the sum of their squares. **4**
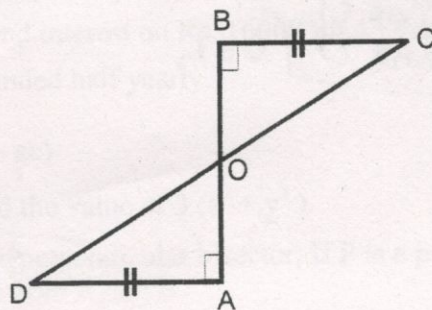
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Q-7.   (a). Simplify $\left(a + \dfrac{1}{a}\right)^2 - \left(a - \dfrac{1}{a}\right)^2$ 3

(b). In what time will Rs. 2400 amount to Rs. 2646 at 10% per annum compounded half yearly.   ③

(c). In the adjoining figure, AD and BC are equal perpendicular to a line segment AB. Show that CD bisects. AB.   4

Q-8.   (a). If □ is an acute angle and Sin □ = Cos □ Find the value of
        $2 \tan^2 □ + \text{Sin}^2 □ - 1$ 3

(b). Factorise : $a^4 - b^4 + 2b^2 - 1$ 3

(c). E and F are mid point of non – parallel sides AD and BC of a trapezium ABCD Prove that
        EF // AB and EF = $\dfrac{1}{2}$(AB + CD).   4

Q-9   (a). Simplify : $(4 + \sqrt{5})(\sqrt{3} - \sqrt{7})$ 3

(b). If $a - b = 7$ and $a^2 + b^2 = 85$, then find the Value of $a^3 - b^3$.   3

(c). In the adjoining figure ABCD is a parallelogram. E and F are mid point of sides AB and CD respectively PQ is any line that meets AD, EF and BC in points P, O and Q respectively. Prove that PO = OQ   4