

Q.11. (b) Solve the equation. [4]

(i) $\sqrt{3x^2 - 2x - 1} = 2x - 2$

(ii) $\frac{x}{x-1} + \frac{x-1}{x} = 2 \frac{1}{2}$

Q.11. (c) Find the value of p for which the equation $3x^2 - px + 5 = 0$ has real roots. [2]

Half Yearly Examination 2018-2019
Mathematics

Class : IX

Time : 2½ hrs.+15min.

Full Marks : 80

Section A (40 Marks)

[Attempt all questions]

Q.1. (a) David has a R. D account in a bank. He deposits Rs. 2500 per month for 2 years. If he gets Rs. 66250 at the time of maturity find. [4]

(i) the interest paid by the bank

(ii) the rate of interest

(b) Find the value of m for which the following equation has equal roots : [3]

$$(m-1)x^2 + 2(m+1)x + 9 = 0$$

(c) Factorise each of the following : [3]

(i) $x^2 - 2xy + y^2 - a^2 - 2ab - b^2$

(ii) $4(2x-3)^2 - 3(2x-3)(x-1) - 7(x-1)^2$

Q.2. (a) The mean of the following distribution is 52. Determine the value of p. [4]

Marks	10-20	20-30	30-40	40-50	50-60	60-70	70-80
No. of Students	5	3	4	P	2	6	13

(b) Evaluate [6]

(i) $(81)^{\frac{3}{4}} - \left(\frac{1}{32}\right)^{-\frac{2}{5}} + 8^{\frac{1}{3}} \left[\frac{1}{2}\right]^{-2} (2)^0$

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(ii) Solve for x, $\sqrt{8^0 + \frac{2}{3}} = (0.6)^{2-3x}$

(iii) $2^x = 3^y = 12^z$ then show that $x = \frac{2yz}{y-z}$

Q.3. (a) Using ruler and compasses, construct a parallelogram ABCD given that AB = 4 cm, AC = 10 cm BD = 6 cm. Measure BC

(b) Draw a histogram and estimate the mode for the following frequency distribution : [3]

Classes	0-10	10-20	20-30	30-40	40-50	50-60
Frequency	3	8	10	5	4	2

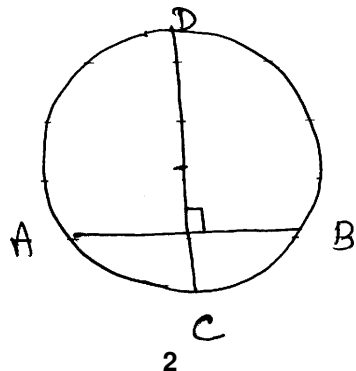
(c) Find the mean, median and mode of the following distribution. [3]

x	3	5	6	7	8	9
f	5	7	8	4	10	6

Q.4. (a) ABC is an isoscles triangle with AB = AC = 12 cm and BC = 8 cm. find the altitude on BC and hence calculate its area. [4]

(b) If the perimeter of a rectangular plot is 68 m and length of its diagonal is 26m. Find its area. [3]

(c) In the adjoining figure, the diameter CD of a circle is per pendicular li the chard AB. If AB = 12 cm and CM = 2 cm. find the radius of the circle. [3]



If the mean of the distribution is 6.5. find the value of p and q.

(c) Factorise :

$$x^3 - \frac{1}{x^3} - 6x + \frac{6}{x} \quad [2]$$

Q.9. (a) The diagonals of a parallelogram ABCD insect at O. Through O, a straight line is drawn parallel to AB to neet AD in P and BC in Q. Prove that

(i) P and Q are mid points of AD & BC respectively

(ii) Area of $\Delta OAB = \frac{1}{4}$ Area of parallel gram ABCD.

(b) Find the mean of the following frequency distribution by short cut method. [4]

CI	0-50	50-100	100-150	150-200	200-250	250-300
frequency	4	8	16	13	6	3

(c) Factorise $x^6 - 7x^3 - 8$ [2]

Q.10. (a) Using ruler and compasses only, construct the quadrilateral ABCD given that AB = 5 cm, BC = 2.5 cm CD = 6 cm $\angle BAD = 90^\circ$ and the diagonal AC = 5.5 cm.

(b) Solve the equation and give the answer correct two decimal place. $4x^2 - 7x + 2 = 0$ [3]

(c) The length of the common chard of two intersecting circles is 30 cm. If the radii of two circles are 25 cm and 17 cm. Find the distance between their centres. [3]

Q.11. (a) Find the area of quadrilateral ABCD in which $\angle B = 90^\circ$ AB = 6 cm BC = 8cm and CD = AD = 13 cm. [4]

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Section B

Answer any four questions

Q.5. (a) Draw ogive for the following distribution. [6]

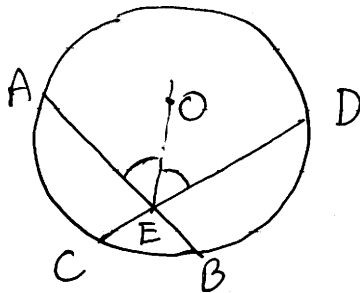
Monthly income in Rs.	6000-7000	7000-8000	8000-9000	9000-10000	10000-11000	11000-12000	12000-13000
No. of Employees	40	68	86	120	90	40	36

Hence determine

- (i) the median income
- (ii) the number of employees whose income exceeds Rs. 11800
- (iii) the lower and upper quartiles.
- (iv) the interquartile range. [4]

(ii) Mr. Ramesh gets Rs. 6455 at the end of one year at the rate of 14% p.a. in a R.D account. Find the monthly instalment.

Q.6. (a) In the figure, chords AB and CD of a circle with centre O intersect at E. If OE bisects $\angle AED$ prove that $AB = CD$. [5]



(b) Two years ago a man's age was three times the square of his son's age. In three years time, his age

{Turn Over}

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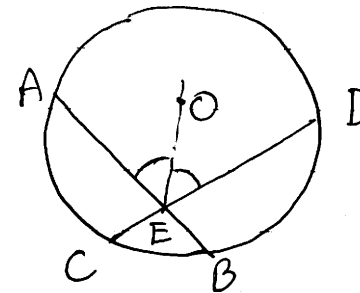
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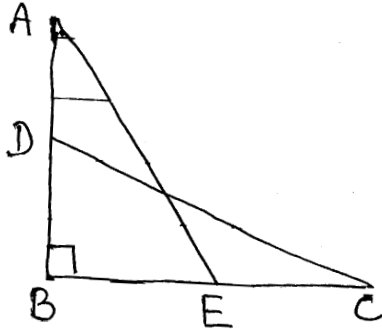


(b) Two years ago a man's age was three times the square of his son's age. In three years time, his age

{Turn Over}

will be four times his son's age. Find their present age.

- Q.7. (a)** In the given figure $AE = DC = 13$ cm, $BE = 5$ cm $\angle ABC = 90^\circ$ and $AD = EC = x$ cm Calculate the length of AB and the value of x [4]



- (b) Simplify [6]

(i)
$$\frac{5^{n+3} - 6 \times 5^{n+1}}{9 \times 5^n - 2^2 \times 5^n}$$

(ii) $3^{4x} = (81)^{-1}$ and $(10)^{1/y} = 0.0001$ find the value of $2^{-x} \times (16)^y$

(iii) Solve for x $5^{2x+3} = 1$

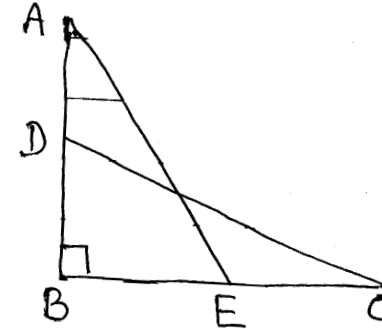
- Q.8. (a)** A car covers a distance of 400 km at a certain speed. Had the speed been 12 km/hour more, the time taken for the journey would have been 1 hour 40 min less. find the original speed of the car. [4]

- (b) Marks obtained by 36 students of a class in a Unit test are given below.

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No. of Students	6	P	10	7	q	3

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