

EDUCOM INSTITUTE

- (i) Section A contains 6 questions 1 mark each.
 (ii) Section B contains 6 questions 2 marks each.
 (iii) Section C contains 10 questions of 3 marks each.
 (iv) Section D contains 8 questions of 4 marks each.

Section - A

Q1: If the HCF of 408 and 1032 is expressible in form of $1032m - 408n$, Find m .

Q2: Find value of k , if $3x^2 - k\sqrt{3}x + 4 = 0$ has equal roots.

Q3: Find the eleventh term from the last of the A.P.
 $27, 23, 19, \dots, -65$.

Q4: Prove that points $(-3, 0)$, $(1, -3)$ and $(4, 1)$ are vertices of an isosceles triangle.

Q5: In trapezium ABCD, $AB \parallel CD$ and $AB = 2CD$. If area of $\Delta AOB = 84 \text{ cm}^2$, Find area of ΔCOD .

Q6: If $\cot A = 2/5$. Find the value of $4 + 4 \tan^2 A$.

Section - B

Q7: Prove that the cube of any positive integer is either of the form $9m$, $9m+1$ or $9m+8$ for integer m .

Q8: If the sum of m terms is equal to n and sum of n terms is equal to m , then find the sum of $(m+n)$ terms.

Q9: Solve the following: $\rightarrow \frac{a}{x} - \frac{b}{y} = 0$

$$\frac{ab^2}{x} + \frac{a^2b}{y} = a^2 + b^2, (x, y \neq 0)$$

Q10: The line joining the points $(2, 1)$ and $(5, -8)$ is trisected at points P and Q . If P lies on $2x - y + k = 0$. Find k .

Q11: A box contains numbers from 123 to 987. Find the probability that the number drawn is: \rightarrow

- (a) a square number.
- (b) a multiple of 13.

Q12: A box contains 12 balls of which some are red in colour. If 6 more red balls are put in the box and a ball is drawn at random, the probability of drawing a red ball doubles than what it was before. Find the number of red balls in the bag.

Section - C

Q13: A round balloon of radius r subtends an angle α at the eye of the observer while the angle of elevation of its centre is β . Prove that the height of the centre of the balloon is $r \sin \beta \operatorname{cosec} \frac{\alpha}{2}$.

Q14: The denominator of a fraction is 4 more than twice the numerator. When both the numerator and denominator are decreased by 6, then the denominator becomes 12 times the numerator. Determine the fraction.

Q15: If α, β are the zeroes of Polynomial $f(x) = 2x^2 + 5x + k$ satisfying the relation $\alpha^2 + \beta^2 + \alpha \cdot \beta = \frac{21}{4}$, Find value of k .

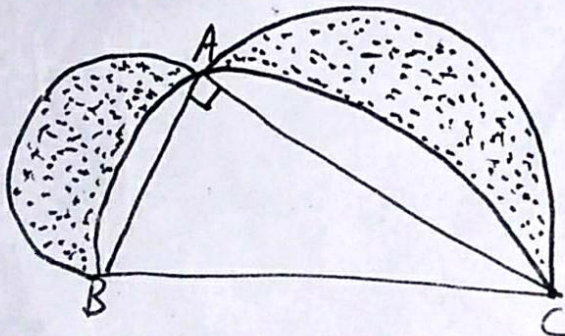
Q16: In what ratio does X axis divide the line segment joining points $(-4, -6)$ and $(-1, 7)$? Find coordinates of points of division.

Q17: Equilateral triangles are drawn on sides of the right angled triangle. Show that area of triangle on the hypotenuse is equal to the sum of areas of triangles on the other two sides.

Q18: Two tangents AB and AC are drawn to a circle with centre O such that $\angle BAC = 120^\circ$. Prove that $OA = 2AB$.

Q19: $\frac{\sec 39^\circ}{\cos 51^\circ} + \frac{2}{\sqrt{3}} \tan 17^\circ \tan 38^\circ \tan 60^\circ \tan 52^\circ \tan 73^\circ - 3(\sin^2 31^\circ + \sin^2 59^\circ)$

Q20: ABC is a right angled triangle in which $\angle A = 90^\circ$ and $AB = 21$ cm and $AC = 28$ cm. Semicircles are described on AB, BC and AC as diameters. Find area of shaded region.



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Q21: Water flows at the rate of 10 metres per minute through a cylindrical pipe 5mm in diameter. How long would it take to fill a conical vessel whose diameter at base is 40 cm and depth 24 cm?

Q22: Prove that In a triangle, if the square of one side is equal to the sum of the squares of the other two sides, then the angle opposite the side is a right angle.

Section - D

Q23: If the mean of following is 54. Find value of P.

<u>Class</u> →	0-20	20-40	40-60	60-80	80-100
<u>Frequency</u> →	7	p	10	9	13

Q24: If the list price of a toy is reduced by Rs 2, a person can buy 2 toys more for Rs 360. Find the original price of the toy.

Q25: An AP consists of 37 terms. The sum of the three middle most terms is 225 and the sum of the last three terms is 429. Find the A.P.

Q26: Draw a right triangle in which sides other than hypotenuse are of lengths 5 cm and 4 cm. Then construct another triangle whose sides are $\frac{2}{3}$ times corresponding sides of the given triangle.

Q27: Prove that $\frac{\sec \theta - \sin \theta + 1}{\sec \theta + \sin \theta - 1} = \sec \theta \csc \theta + \cot \theta$.

Q28: Find the coordinates of the centre of circle passing through the points (0,0), (-2,1) and (-3,2). Also find its radius.

Q29 = Derive Formula for volume of frustum and Quadratic Formula.

Q30 = The following table gives production yield per hectare of wheat of 100 farms of a village.

<u>Yield</u> \rightarrow	50-55	55-60	60-65	65-70	70-75	75-80
<u>No. of farms</u> \rightarrow	2	8	12	24	38	16

Draw less than ogive and more than ogive. Also find the median by using it.