

MATHEMATICS : ALGEBRA (SET-A)

Time : 2.30 Hrs.) Question Paper : September 2010 (Max. Marks 60)

Note : Please see to Question Paper March 2009.

Q. 1 : Attempt any six of the following sub-questions. (12)

(i) Solve the following linear equation in one variable : $4(m + 3) = 16$.

(ii) Find the HCF of $27x^2$; $36x$.

(iii) Simplify :
$$\frac{4x^2 - 9y^2}{(2x + 3y)(4x - 9y)}$$

(iv) Sachin invested Rs. 700 in shares of face value Rs. 10 each at the market price of Rs. 10 each. Company declares a dividend of 15%. Find his dividend.

(v) Find the 7th term of the A. P. 6, 10, 14,

(vi) Write the following equation in the form $ax^2 + bx + c = 0$: $t^2 - 3t = 4 - 2t$.

(vii) Convert the binary integer to its decimal equivalent : 1100_2 .

(viii) In a bag, there are fifty cards bearing the numbers from 1 to 50. One card is drawn at random. Write down the sample space S and number of sample points.

Q. 2 : Attempt any four of the following sub-question. (12)

(i) Solve the following equations by Cramer's Rule :

$$2x + 3y = 8, 3x + 2y - 7 = 0.$$

(ii) A TV set is bought for Rs. 17,500 and sold for Rs. 19,700 by a dealer. The rate of M-VAT is 12.5%. Find VAT to be paid by the dealer with subtraction method.

(iii) Find the sum of all natural numbers between 50 and 250 which are exactly divisible by 3.

(iv) Convert the decimal integer to its binary equivalent by using division-remainder technique : 139_{10} .

(v) Marks obtained by a student in an examination are given below.

Draw pie diagram representing this information

Subject	Marathi	English	Science	Mathematics
Marks	85	85	90	100

(vi) Find the LCM of the following polynomials : $a^2 - 3a + 2$; $2a^2 - 5a + 2$.

Q. 3 : Attempt any four of the following sub-questions : (12)

(i) A TV set can be purchased for Rs. 7000 cash or for Rs. 3600 cash down payment together with Rs. 3570 to be paid after four months in one instalment. Find the rate of interest.

(ii) If $(y - b)$ is the GCD of $(y^2 - y - 6)$ and $(y^2 + 3y - 18)$, then find the value of b .

(iii) Solve the following quadratic equation by the formula method. $6p^2 - 7p - 1 = 0$.

(iv) Simplify the following. $1111_2 + 1001_2 - 1101_2 + 10111_2$.

(v) There are 15 tickets bearing the numbers from 1 to 15 in a bag and one ticket is drawn at random from the bag. Find the probability of the event that the ticket drawn.

(a) bears an even number.

(b) bears a number which is a multiple of 5.

(vi) Sukhdev purchased ten plywood doors. The sale price of one piece is Rs. 1125 and the rate of central sales tax is 4%. Find the net selling price of 10 pieces.

Q. 4 : Attempt any three of the following sub-questions : (12)

(i) Simplify the following.
$$\frac{2m^2 + 7m - 4}{3m^2 - 13m + 4} \cdot \frac{4m^2 - 1}{6m^2 + m - 1}$$

(ii) Find the median

Class Interval	0-10	10-20	20-30	30-40	40-50
Frequency	5	8	15	15	7

(iii) When 1 is added to the numerator as well as the denominator of a certain fraction, it becomes $\frac{3}{5}$ and if 1 is subtracted from both the numerator and the denominator, it becomes $\frac{1}{2}$. Find the fraction.

(iv) The sum of the ages of father and his son is 35 years and the product of their ages is 150. Find their ages.

(v) If the 5th and 12th terms of an A.P. are 14 and 35 respectively, find the first term and the common difference.

(vi) For a person (man) monthly salary is Rs. 8650 (exclusive of C. A.) and his deductions are as follows.

LIC Rs. 135 p. m., GPF Rs. 500 p.m. Profession Tax Rs. 2500 p.a. Infrastructure bonds Rs. 5000.

Find his taxable amount for the financial year 2006-07.

Q. 5 : Attempt any three of the following sub-questions :

(12)

(i) Solve the following simultaneous equations by using graphical method

$$y = 6 - 3x; y = 4 - x.$$

(ii) A coin is tossed thrice. Find the probability of the events that

(a) head appears twice

(b) head appears at the most twice.

(iii) A man borrows certain amount which is to be paid back in two equal annual instalments.

Compound interest is calculated at the rate of 10% p.a. If each instalment is Rs. 6105, find the sum borrowed.

(iv) A person buys 200 shares of face value Rs. 10 each from a company. He sells out these shares at Rs. 18 each. While selling he pays 2% brokerage. Find his profit and profit per cent.

(v) Find the mean by steep deviation method

Pocket Money (per day in Rs.)	0-10	10-20	20-30	30-40	40-50
No. of Students	3	7	5	2	6

(vi) Simplify : $\frac{3+2x}{2-x} - \frac{2-3x}{2+x} + \frac{16x-x^2}{x^2-4}$