

# ALGEBRA (PAPER I)

## Question Paper - March 2008

(Max. Marks : 60)

Time : 3 Hours )

- Note : (i) All questions are compulsory.  
(ii) Use of calculator is not allowed.

Q. 1. Attempt any Six subquestions of the following :

(12)

(i) Find the value of the following determinant :  $\begin{vmatrix} 6 & 5 \\ 2 & 3 \end{vmatrix}$

(ii) Find the H.C.F. of the following polynomials :  $(9x^2 - 16y^2)$ ,  $(3x - 4y)^2$

(iii) Simplify the following :  $\frac{y^2}{y+5} + \frac{10y}{y+5} + \frac{25}{y+5}$

(iv) Solve the following quadratic equation by factorization method :  $x^2 + 7x + 12 = 0$ .

(v) Convert the following decimal integer to its binary equivalent by using division remainder technique :

$24_{10}$

(vi) For an A.P.,  $t_1 = 20$ ,  $t_n = 200$  and  $n = 10$ , find  $S_n$ .

(vii) A box contains balls marked with the numbers 1 to 15. One ball is drawn at random. A is the event that its number is divisible by 4. Write the event A and  $n(A)$ .

(viii) A sum of Rs. 1,836 was invested in equity shares of Rs. 10 each at Rs. 150 market price and brokerage of 2% was paid. How many shares were purchased ?

Q. 2. Attempt any four subquestions of the following :

(12)

(i) Solve the following simultaneous equations :  $13x + 15y = 19$ ,  $15x + 13y = 9$ .

(ii) Find L.C.M of the following polynomials :  $x^2 - 4$ ;  $x^2 + 2x - 8$ .

(iii) Add the binary numbers :

$1010_2 + 1110_2$

(iv) Find the 7th term in  
A.P. 1, 5, 9, 13, .....

(v) Find the median :

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

(vi) Sukhadev purchased ten plywood doors. The selling price of one piece is Rs. 1,125 and rate of central sales tax is 4%. Find the net selling price of 10 pieces.

Q. 3. Attempt any four subquestions of the following :

(12)

(i) The H.C.F. of the polynomials  $p(x) = 2x^3 - 2$  and  $q(x) = x^2 - 2x + 1$  is  $(x-1)$ . Find their L.C.M.

(ii) If  $x = 5$  is the solution of  $kx^2 - 14x - 5 = 0$ , then what is the value of  $k$  ?

(iii) Solve the following :  $10101_2 - 1001_2$

(iv) Two coins are tossed. A is an event that at least one head turns up. Find the probability of event A.

(v) An electric iron is sold for Rs. 600 cash or for R . 300 down nt with R

**Q. 4. Attempt any three subquestions of the following : (12)**

(i) Solve following simultaneous equations by using graphical method :  $y = 6 - 3x$ ;  $y = 4 - x$ .

(ii) Simplify the following :  $\frac{m^2 + 9m + 20}{m^2 - 16} \div \frac{m^2 - 2m - 35}{m^2 + 3m - 28}$ .

(iii) A bus covers 300 km distance with a uniform speed. If its speed is increased by 10 km/hr, it will take 1 hour less to cover the same distance. Find the speed of the bus.

(iv) Find the sum of all natural numbers between 50 to 250 which are divisible by 6.

(v) Draw a pie-diagram to represent the following information

Mode of Transport	Number of Student
Bicycle	140
Bus	100
Walk	70
Train	40
Car	10
<b>Total</b>	<b>360</b>

(vi) Smt. C. Archana has her gross annual income for the financial year 2006-2007 of Rs. 1,48,000 and her savings are as follows : (1) L.I.C. Rs. 4,800 p.a. , (2) P.L.I. Rs. 2,750 p.a. Find the net income tax to be paid by Smt. C. Archana, for the financial year 2006-2007.

**Q. 5. Attempt any three subquestions of the following. (12)**

(i) An obtuse angle of a rhombus is greater than thrice the acute angle by 20 Find the measure of each angle .(Use two Variables ).

(ii) Simplify the following :  $x^2 - 2x + 4 - \frac{x^3}{x+2}$

(iii) A die is thrown. A is the event that the prime number comes up. B is the event that the number divisible by 3 comes up. C is the event that the perfect square number comes up. Write the sample space S, number of sample points  $n(S)$ , events A, B, C and  $n(A)$ ,  $n(B)$  and  $n(C)$ .

(iv) Find the mode :

Marks (x)	No. of Student (f)
0 - 10	4
10 - 20	16
20 - 30	15
30 - 40	20
40 - 50	
50 - 60	5

(v) Sum of Rs, 31,500 is borrowed and paid back in two years in two equal instalments at 10% pa. compound interest. Find the amount of each instalment.

(vi) A person buys 100 shares of face value Rs. 10 each from a company. He sells these shares at Rs. 15 each while selling he gave 25% breakage. Find his Profit and Profit percent.