

Date : 26/3/2008

# ALGEBRA - PAPER I

Time : 3 Hours )

## Question Paper - March 2008

( Max. Marks : 60

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 Rs. 300 cash down payment together with Rs. 330 to be paid after 8 months in one instalment. Find the rate of interest charged in the instalment scheme.
- (vi) The value of purchasing an article is Rs. 860 and the value of its selling is Rs. 920. Find M - VAT by invoice method at the rate 12.5%.

**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 : [www.UniversityQuestionPapers.com](http://www.UniversityQuestionPapers.com)

| Marks (x) | No. of Student (f) |
|-----------|--------------------|
| 0 - 10    | 4                  |
| 10 - 20   | 16                 |
| 20 - 30   | 15                 |
| 30 - 40   | 20                 |
| 40 - 50   | 7                  |
| 50 - 60   | 5                  |

- (v) Sum of Rs, 31,500 is borrowed and paid back in two years in two equal instalments at 10% p.a. 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 pays 2% brokerage. Find his profit and profit percent.

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