

Roll No.

Total No. of Pages : 02

Total No. of Questions : 07

B.Sc.(IT) / BCA (2011 & Onwards) (Sem.-2)

MATHEMATICS – II

Subject Code : BSIT/BSBC-202

Paper ID : [B1114]

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains SIX questions carrying TEN marks each and students has to attempt any FOUR questions.**

SECTION-A

1. Write briefly :

- Define non-singular matrix.
- Define Minors.
- Define Statistics.
- Differentiate Mean deviation and Standard deviation.
- Define Rank of a Matrix.
- What is differentiation by First Principle?
- What do you mean by Indefinite Integral?
- What is Simpson's $\frac{1}{3}$ rule?
- Define Maxima and Minima.
- What do you mean by Power Functions?

SECTION-B

2. Obtain the inverse of the following matrix using elementary operations :

$$A = \begin{bmatrix} 3 & 0 & -1 \\ 2 & 3 & 0 \\ 0 & 4 & 1 \end{bmatrix}$$

3. Prove that
$$\begin{vmatrix} -bc & b^2+bc & c^2+bc \\ a^2+ac & -ac & c^2+ac \\ a^2+ab & b^2+ab & -ab \end{vmatrix} = (ab+bc+ca)^3$$

4. a) The mean, standard deviation and range of a symmetrical distribution of weights of a group of 20 boys are 40, 5 and 6 Kgs, respectively. Find the mean and standard deviation of the group if the lightest and the heaviest boys are excluded.

- b) 20% workers in an industry which employs a total of 2000 men earn less than Rs.20 per hour, 440 earn from Rs.20 to 22.4 per hour, 24% earn from 22.5 to 24.9 per hour, 370 earn from Rs.25 to 27.4 per hour, 12 % earn from Rs. 27.5 to 29.9 per hour and the rest earn Rs 30 or more per hour. Make a frequency table and calculate modal wage.

5. Differentiate $\tan^{-1}\left(\frac{\sqrt{1+x^2}-1}{x}\right)$ with respect to $\tan^{-1} x$.

6. A man buys a car for Rs. 16,000. He estimates that its value will depreciate each year by 20 percent of its value at the beginning of a year. Find the depreciated value (Rs x, correct to the nearest rupee) of the car at the end of five years. If the man sets aside at the end of each of the five years a certain fixed sum (Rs y) to accumulate at 4 percent compound interest in order to be able to buy at the end of the five years another car costing Rs 22,000 (after allowing the above depreciated value Rs x for the old car in past exchange), find to nearest paisa the value Rs y of each payment.

7. Find $\int \frac{1}{x^3+1} dx$.