

- (b) A man borrows Rs. 6,000 at 6% and promises to pay off the loan in 20 annual payments beginning at the end of the first year. What is the annual payment necessary?

SECTION - IV

8. (a) If $p = \frac{4xy}{x+y}$, find the value of:

$$\frac{p+2x}{p-2x} + \frac{p+2y}{p-2y}$$

- (b) If a, b, c, d are in proportion prove that:

$$\frac{(a-c)b^2}{(b-d)cd} = \frac{a^2 - b^2 - ab}{c^2 - d^2 - cd}$$

9. (a) A machine was purchased 3 years ago. Its value depreciates at the rate of 10% p.a. If its present value is Rs. 94,770, for how much was it purchased?
- (b) A bicycle was sold at a gain of 16%. Had it been sold for Rs. 70 more, the gain would have been 20%. Find the cost price of the bicycle.

Roll No.....

61151

B. Com. 2nd Semester (Pass Course)

w. e. f. Session 2014-15

Examination - May, 2016

BUSINESS MATHEMATICS-II

Paper : 2.02

Time : Three Hours]

[Maximum Marks : 80

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt five questions in all, selecting *one* question from each Section. Q. No. 1 is *compulsory*.

1. (a) If $\begin{bmatrix} a+b & 2 \\ 5 & ab \end{bmatrix} = \begin{bmatrix} 6 & 2 \\ 5 & 8 \end{bmatrix}$, find the values of a & b .

(b) If $\begin{vmatrix} x+1 & x-1 \\ x-3 & x+2 \end{vmatrix} = \begin{vmatrix} 4 & -1 \\ 1 & 3 \end{vmatrix}$, then write the value of x .

(c) If $y = \frac{(x+1)(x-2)}{\sqrt{x}}$, find $\frac{dy}{dx}$.

- (d) The side of a square sheet of metal is increasing at the rate of 3 cm per minute. At what rate is the area increasing when the side is 10 cm long?

(e) Find simple interest on Rs. 8,000 for 9 months at $16\frac{2}{3}\%$ p.a.

(f) Define annuity due.

(g) If $x : y = 2 : 3$, find the value of $3x + 2y : 2x + 5y$.

(h) If A's income be 20% more than B's, how much percent is B's income less than A?

SECTION - I

2. (a) Construct a 2×5 matrix $C = [C_{ij}]$ where:

$$C_{ij} = \frac{|2i - 3j|}{2}$$

(b) If $A = \begin{bmatrix} 4 & 3 & 7 \\ 6 & 5 & -8 \\ 1 & 2 & 6 \end{bmatrix}$ express A as the sum of symmetric and skew-symmetric matrix.

3. (a) Prove that:

$$\begin{vmatrix} 1 & 1 & 1 \\ \alpha & \beta & \gamma \\ \beta\gamma & \gamma\alpha & \alpha\beta \end{vmatrix} = (\beta - \gamma)(\gamma - \alpha)(\alpha - \beta)$$

(b) Find the inverse of the matrix $\begin{bmatrix} 1 & 2 & -2 \\ -1 & 3 & 0 \\ 0 & -2 & 1 \end{bmatrix}$ and

verify that $AA^{-1} = I$.

611 51-15000-(P-4)(Q-9)(16) (2)

SECTION - II

4. Write down the derivatives of the following functions:

(i) $\frac{1}{\sqrt{2+x}}$

(ii) $\frac{(3-5x)^{-1/2}(3-5x)^{1/3}}{(3-5x)^{1/2}}$

(iii) $\sqrt{\frac{1-x^2}{1+x^2}}$

(iv) $\frac{e^x + 4}{e^x + x^2}$

5. (a) Write down the derivatives of the following functions:

(i) $x^{\log x}$

(ii) $(2x+3)^{(x-5)}$

(b) Divide 30 into two parts such their product is maximum.

SECTION - III

6. (a) At what rate percent a sum of Rs. 1600 amounts to Rs. 1933 after 2 years if interest is compounded half yearly.

(b) The simple and compound interest on a certain sum for two years are respectively Rs. 40 and Rs. 41. Find the rate and the sum.

7. (a) Find the amount of an annuity of Rs. 500 payable at the end of each year for 14 years, if money is worth 5% compounded annually.

611 51-15000-(P-4)(Q-9)(16) (3)

P.T.O.