Reg. No. | | | | | | | | | |

BBMBMC 207

Credit Based III Semester B.B.M. Degree Examination, Oct./Nov. 2013
(New Syllabus) (2012-13 Batch Onwards)
BUSINESS MATHEMATICS

Time : 3 Hours Max. Marks : 80

***Note** : Use of scientific calculator is not **permitted**.*

SECTION – A (**One** mark **each**)

1. Answer **any ten** of the following questions : **(1×10=10)**

a) For what value of 'a', $ax^2 + bx + c = 0$ becomes a linear equation ?

b) State any one property of determinants.

c) If A is matrix of order 3×2 and B is another matrix of order 2×4 then what is the order of AB ?

d) Define cofactor of an element in a matrix.

e) The sum of n terms of an A.P. is $3n^2 + 2n$. What is its first term ?

f) Write the 10^{th} term of an G.P. having the common ratio 2 and first term 2.

g) The ratio of two numbers is 2 : 3 and their sum is 85. Find the numbers.

h) A banker discounts a bill of face value Rs. 5,000/- which has to run 73 days before it is legally due at 6% p.a. interest. What is the discounted value of the bill ?

i) A retailer sells an item for Rs. 114.40 after giving 12% cash discount. What is the list price of the item ?

j) What is value of x if log x = 0 ?

k) What sum should be invested today so that it becomes Rs. 5,000 after 3 years at 10% compound interest ?

l) Find the present value of perpetuity immediate of Rs. 4,000 at 12% p.a. compound interest.

SECTION – B (**5** marks **each**)

Answer **any five** of the following questions. **(5×5=25)**

2. Two numbers are in the ratio 5 : 8. If 9 is added to each, they are in the ratio 8 : 11. Find the numbers.

3. If $A = \begin{bmatrix} 9 & 1 \\ 4 & 3 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 5 \\ 7 & 12 \end{bmatrix}$ find the matrix X such that $3A + 5B + 2X = 0$.

4. A person buys national savings certificates of values exceeding last year's purchase by Rs. 100. After 10 years, he finds that the total value of the certificates purchased by him is Rs. 5,000. Find the values of certificates purchased by him (i) in the first year (ii) in the eighth year.

5. Find the equated due date of the following bills.
   Rs. 5,000 due on 15th May
   Rs. 2,500 due on 26th June
   Rs. 4,420 due on 18th August.

6. 5 men each working 9 hours a day can finish a work in 30 days. How many men are required to finish eight times the work in 25 days each working 8 hours a day ?

7. A bank offers 17% p.a. compound interest on a vehicle loan, the interest payable annually where as a co-operative society offers 16.42% p.a. compounded quarterly.Use effective rate of interest to decide from where a customer should avail the loan.

8. A flat 'owners' association needs to provide a sinking fund of Rs. 50,000 in six year's time for white washing and can invest at 5% p.a. How much should be set aside by each flat owner at the end of each year ? Number of flats is 20.

SECTION – C (15 marks each)

Answer **any three** questions. (3×15=45)

9. a) Solve the following equations by Cramer's rule.

$3x + 2y + 5z = 32$

$2x + 5y + 3z = 31$

$5x + 3y + 2z = 27$ 10.

b) The sum of a number and its reciprocal is $\frac{41}{20}$. Find the numbers. 5

10. a) Solve the following equations by matrix inverse method.

$x - y + 3z = 5$

$4x + 2y - z = 0$

$x + 3y + z = 5$ 10

b) If the 3rd and 6th terms of A.P. are 7 and 13 respectively, find the first term and common difference. 5

11. a) An employer reduces the number of employees in the ratio 9 : 8 and increases wages in the ratio of 14 : 15. Find in what ratio the wage bill increased or decreased. Also, find the difference in the amount of the bill if it was previously Rs. 1,890/-. 5

b) A person borrowed Rs. 5,000 from a money lender and agreed to pay four installments of Rs. 1,500 each at the end of 3,6,9 and 12 months. Find the rate of simple interest charged p.a. by the money lender. 5

c) A banker paid Rs. 2,574/- for a bill of Rs. 2,628 draw on 15th May at 6 month's date. On what day the bill was discounted if the rate of interest is 10% p.a. 5

12. a) Show that $\log\frac{63}{51} - \log\frac{42}{26} + \log\frac{17}{13} = 0$. 5

b) Find the compound interest on a sum of Rs. 6,280/- for one year seven months at the rate of 8% p.a. compounded quarterly. 5

c) Calculate the present value of an annuity of Rs. 5,000/- per annum for 12 years, the interest being 4% p.a. compounded annually. 5