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BBMBMC 207

**Credit Based Third Semester B.B.M. Degree
Examination, November/December 2015
(2012 Scheme)
BUSINESS MATHEMATICS**

Time : 3 Hours

Max. Marks : 80

- Instructions :** i) *Use of Scientific Calculator is not permitted.*
ii) *Logarithm tables will be supplied on request.*

SECTION – A (1 mark each)

1. Answer **any ten** of the following : (1×10=10)
- Divide 85 in the ratio 2 : 3.
 - Solve the equation $3x^2 - 5x - 2 = 0$ by factorization.
 - If $A = \begin{pmatrix} 3 & 5 \\ 2+p & 5 \end{pmatrix}$ is a singular matrix, find p.
 - Define co-factor of an element in a matrix.
 - Find the sum of natural numbers from 3 to 50.
 - In a G.P. the first term is 8 and common ratio is $\frac{1}{2}$. Find the 4th term.
 - If A and B share profits in the ratio 2 : 3 and if A gets Rs. 500/- as his share, how much does B gets ?
 - In what time will Rs. 425 amounts to Rs. 510 at 4% simple interest ?
 - Find the Banker's Discount on a bill of face value Rs. 2,500 due after 2 months discounted at 18% p.a.
 - Find x if $\log_3 x = 1$.
 - Find the compound interest of Rs. 3,000 for 3 years at 8% p.a.
 - Define perpetuity.

P.T.O.



SECTION – B (5 marks each)

Answer **any five** of the following :

(5×5=25)

2. If 5 men earn Rs. 4,200 in 15 days working 8 hours a day how much will 16 men earn in 8 days working 6 hours a day ?
3. If $A = (3, 2)$; $B = \begin{bmatrix} 1 & 0 \\ 3 & -1 \end{bmatrix}$ and $C = \begin{bmatrix} 4 \\ 1 \end{bmatrix}$, find $A(BC)$, $(AB)C$. Is $A(BC) = (AB)C$?
4. The sum and product of three numbers in G.P. are 42 and 1728 respectively. Find the numbers.
5. Find the equated due date of payments of following bills :
 Rs. 5,000 due on 15th May
 Rs. 2,500 due on 20th June
 Rs. 3,080 due on 10th July
 Rs. 4,420 due on 18th August.
6. A bill of ₹ 6,000 drawn at 3 months was discounted for ₹ 5,700 on July 10. If the rate of interest was 12% p.a.; on which date was the bill drawn ?
7. A sum of ₹ 4,000 borrowed 5 years back amounts to ₹ 8,500 now find the rate of compound interest.
8. A loan of ₹ 5,00,000 is repaid in 20 equal annual instalments. At 15% p.a. compound interest what should be the instalment ?

SECTION – C (15 marks each)

Answer **any three** questions from the following :

(15×3=45)

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

10

$$2x + 4y - 2z = 0$$

$$4x + 3z = 25$$

$$6x + y + 2z = 23$$

b) Solve $\frac{3}{x-2} + \frac{5}{x-6} = \frac{8}{x+3}$.

5



10. a) Solve the following equations by inverse matrix method : 10
- $x + 2y + 3z = 14$
 $3x + y + 2z = 11$ ✓
 $2x + 3y + z = 11$
- b) A man saved Rs. 1, 65,000 in 10 years. In each year after the first, he saved Rs. 1,000 more than he did in the preceeding year. How much did he save in the first year. 5
11. a) Two numbers are in the ratio 3 : 13 when 6 is added to the first number and 6 is subtracted from the second number, their ratio became 9 : 23 find the given numbers. 5
- b) A retailer buys a product at 20% trade discount on the catalogue price of ₹ 5,000. He sells it at the catalogue price. What is the profit made by him ? What is the percentage of profit made by the retailer ? 5
- c) A merchant borrowed ₹ 8,500 on January 15, 2004 and repaid it with interest on June 9th of the same year at 8% simple interest. What sum was repaid by him ? 5
12. a) Show that $\log \frac{81}{16} - \log \frac{8}{9} + \log \frac{128}{243} = \log 3$. 5
- b) At certain rate of interest compounding quarterly a sum doubles in 5 years : 5
- i) Find the nominal rate of interest.
ii) Find the effective rate of interest.
- c) A company set aside ₹ 1,25,000 at the end of every year to create a sinking fund. What will be the fund amount at the end of 10 years at 5% p.a ? 5