

Roll No.....

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Department of Management
School of Management and Business Studies
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BBA –I Semester Nov-Dec Exam '2018
Business Mathematics (BBA-P-01)

Time:3hrs

Maximum Marks:75

*Scientific Calculators allowed

Section:A Attempt any 6 question. Each question carries 5 marks

Q1) The sum of two numbers is 84. If the two numbers are in the ratio of 4:3, find the two numbers?.

Q2) The total monthly sales of two companies A & B are in the ratio 2:3 and their total monthly expenditures are in the ratio 3:4. Find the ratio of the profits of the two companies given that Company A's profit is equal to a fifth of its sales.

Q3) The percentage increase in the value of exports of apples of a country is as follows:

$$2001-2002 = 25\% ; 2002-2003 = 20\% ; 2003 - 2004 = 10\%$$

What is the percentage increase in the value of exports of apples of the country from 2001 to 2004?

Q4) The average of a group of 10 friends is 15 years. A new friend joins them & their average age increases to 16 years. What is the age of the new friend?

Q5) Find the 10th term of an AP whose first term is 2 and the common difference is 3?

Q6) If the 7th term of a GP, having all positive terms, is $\frac{729}{1024}$ and the first term is 4, find the common ratio?

Q7) If Rs 4000 becomes Rs 4800 in 2 years, what will Rs 6000 become at the end of 6 years at the same rate of interest, under simple interest?

Q8) What sum would amount to Rs 29282 in three years at the rate of 10% p.a. compound interest?

Q9) If A, B and C are three sets and U is the universal set such that $n(U) = 700$, $n(A) = 200$, $n(B) = 300$ and $n(A \cap B) = 100$. Find $n(A' \cap B')$?

Section: B Attempt any 3 question. Each question carries 15 marks

Q10 . Solve the following system of equations using inverse of the matrix method.

$$2x+4y-z=9 ; 3x+y+2z=7 ; x+3y-3z = 4$$

Q11. Solve the following system of linear equations using the Gaussian Elimination method.

$$x+2y+z = 7 ; x+3z = 11 ; 2x-3y = 1$$

Q.12 (a) If the letters of the word "NUMBERS" are permuted in all possible ways, then in how many of these permutations are the vowels never together i.e. vowels are separated?

(b) In how many ways can the letters of the word "MANIFOLD" be arranged so that the vowels are separated?

(c) There are 3 candidates for a classical, 5 for a mathematical and 4 for a Natural Science scholarship. In how many ways can these scholarships be awarded?

Q.13 Anusha has a collection of 7 CDs with her - Ironman, Sound of Music, Titanic, Small Wonders, Stuart Little, Chariots of Fire and Toy Story. Nikhil wanted to borrow 4 of these CDs to watch during vacation;

(a) In how many ways can Nikhil borrow the CDs?

(b) In how many ways can Nikhil borrow the CDs if he wants to include Stuart Little in his selection?

(c) If Nikhil wants to exclude Titanic, then in how many ways can the selection be made?

(d) In how many ways can Nikhil borrow the CDs if he is particular that his selection should include both Small Wonders and Toy Story if at all one of them is included?

(e) How many selections can be made if Nikhil does not want to include Small Wonders and Toy Story together?

Q14. The total cost $C(q)$ of a firm is given by:

$$C(q) = 5000 + 1000q - 500q^2 + 0.67q^3, \text{ where } q \text{ is the output. Determine,}$$

(a) Average Cost Function ;

(b) Slope of Average Cost Function ;

(c) Marginal Cost Function ;

(d) Slope of Marginal Cost Function &

(e) value of q , for which $MVC = AVC$, where VC denotes variable cost.

Q15. (a) Solve the following integral with the method of integration by substitution;

$$\int x^3 (e^{(x^4+5)}) dx$$

(b) Solve the following integral with the help of integration by parts method;

$$\int x \cdot \log x \, dx$$

(c) The marginal revenue function for a company's product is:

$MR = 60000 - 3x$, where x equals the number of units sold. If total revenue equals 0, when no units are sold, determine the total revenue function for the product?
