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Department of Management
School of Management & Business Studies
Jamia Hamdard, New Delhi-62

BBA INTEGRATED - Semester -I- Examination, November - December 2019

Business Mathematics; BBA (I) - P - 01

Time Allowed: 3 Hours

Max Marks: 75

***Scientific calculators are allowed.**

Section A

Attempt any 6 (Six) questions. Each Question carries 5 marks. [6*5=30]

Q1. If A & B are two matrices given below, find AB.

$$A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & -1 & 1 \\ 5 & 4 & 0 \end{bmatrix} \quad B = \begin{bmatrix} 0 & 3 & 1 \\ 1 & 1 & 2 \\ 3 & 4 & -2 \end{bmatrix}$$

Q2. There are two runners A & B in a 100m race. If A is 20% faster than B then B is how many percentage points slower than A? Also, the time taken by A is what percentage of the time taken by B to complete the race? [2+3]

Q3. There are three friends A, B & C who want to divide a cake amongst them. If A wants $\frac{1}{6}$ th of the cake & B wants $\frac{2}{3}$ rd of the remaining cake, what is the share of cake received by C? Further if D joins them and they want to redo the distribution of the cake, what would be the share of D if A, B & C share $\frac{12}{19}$ th of the cake in the ratio of 2:3:4. [3+2]

Q4. The total cost of a company can be arrived at by adding two components, one is fixed and independent of output & the other is directly proportional to its output. The company incurred a cost of Rs 500000 for an output of 5000 units & a cost of Rs 1000000 for an output of 7500 units. Find the total cost of producing 10000 units?

Q5. A bought 100 shares of company X for Rs 5000. At what price should he buy another 200 shares of the same company so that the average price becomes Rs53.25/share?

Q6. A generally reads 10 pages of a book per day whose length is 300 pages. The book gets harder & harder to read as he progresses through the book & consequently his average reading speed falls by 1 page per day for every 50 pages that he reads after the first 50 pages. How many days would be required to read the entire book and what would be the average number of pages read per day?

Q7. If a sum doubles in 7 years by applying simple interest, what is the rate of interest implicit in this case?

Q8. If X deposits Rs 1000 in a bank deposit providing a rate of interest of 15% p.a compounded quarterly for 4 years. What would be the sum that he will get after the expiry of years? Assuming he also deposits another Rs 10000 in another account paying simple interest

@ 15% p.a. for 4 years. What will be the difference in interest earned from these two different deposits after 4 years? [2+3]

Q9. There are 100 guitar players in a music class. Of them, 60 play acoustic guitar & 40 play electric guitar only. If 40 players play acoustic guitar only, how many play both acoustic and electric guitars & how many play the electric guitar? [2+3]

Section B

Attempt any 3 (three) questions. Each question carries 15 marks [3*15=45]

Q10. Calculate the value of x , y & z using matrix inversion method for the following system of equations

$$x + 2y + 3z = 12; x - y + 2z = 6; 2x + 2y - z = 9$$

Q11. Solve the following system of linear equations using the Gauss Elimination Method

$$x - y + 2z = 8; y + z = 12; x + 3y - 2z = 4$$

Q12 (i) Find dy/dx for $y = x^3 - e^x + a^{3x} + 2$ [5]

Q12 (ii) The total cost function of a firm is given by $C(q) = 5000 + (3/2)q^3 - 2q^2 + 10q$. Find the Marginal cost function, the average cost function, the total variable cost function, marginal variable cost function & the slope of Average cost function. [3+2+2+3]

Q13. (i) Find the value of $\int x \log x \, dx$ [7]

Q13 (ii) From the following MPC function arrive at the Consumption function, $MPC = 20 + 10Y + (5/6)Y^{-2/3}$. Also find out consumption when $Y = Rs 300$ [5+3]

Q14. (i) How many different words with or without meaning can be formed from the letters of the word "SIKKIM"? [5]

Q14 (ii) In how many ways can a teacher choose 2 boys & 3 girls from a group consisting of 5 boys & 7 girls? [5]

Q14(iii) Assuming the teacher chooses 2 boys & 3 girls from the group as given in Q14(ii) above, in how many ways can these students be made to stand in a row such that the boys occupy even places & the girls occupy odd places? [5]

Q15 (i) The first term of an AP is 5 and the common difference is 7. Find the difference between the 100th term & 137th term of the AP. Also find out the sum of terms starting from T_{55} to T_{99} . [5]

Q15 (ii) The T_{13} of a GP is 20480 & the T_7 of the same GP is 320. Find the sum of first 10 terms of the GP. [5]

Q15 (iii) If the sum of 10th term of an AP and the 10th of a GP is 98463, and the sum of the 5th term of the same AP & the 5th term of the same GP is 428, find the common ratio of the GP, given that the common difference of the AP & the first term of the GP both are equal to 5 and also that the common ratio of the GP is a prime number less than 10. [5]
