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School of Management and Business Studies
Department of Management
Odd Semester Examination - March 2023
BBA - I Semester

Roll No...

EX

BBA-P-01

BBA-S-01 & Business Mathematics

Duration: 3 Hour

Max.Marks -60

(4X6=24)

Section A - Short Answer

Note: Attempt any Six Questions, All questions carry equal marks

Q1: A store bought a batch of 1,000 items at a cost of Rs. 2 per item. They marked up the price by 50% and sold 800 of the items at the marked-up price. They then marked down the price by 20% and sold the remaining 200 items at the marked-down price. What was the store's overall profit percentage on the batch of 1,000 items?

Q2: A recipe for a cake calls for 2 cups of flour, 1 cup of sugar, and 1/2 cup of butter. If you want to make a larger cake that requires 4 cups of flour, what are the new amounts of sugar and butter that you would need to use, assuming that you want to maintain the same ratio of ingredients?

Q3: Find the area under the curve $y = 2x + 1$ between the x-axis and the line $x = 3$.

Q4: A company has two products, X and Y, and wants to compare their sales performance. Product X has 10,000 units sold at Rs. 50 each, while Product Y has 5,000 units sold at Rs. 80 each. What is the weighted average selling price per unit for the company as a whole, and which product contributes more to the company's overall revenue?

Q5: A company's sales increased by 25% in the first quarter and then decreased by 10% in the second quarter. What was the net percentage change in sales from the start of the year to the end of the second quarter?

Q6: A company is offering a cash prize of Rs. 1,00,000 to a contest winner, with the prize increasing by 50% each day until a winner is announced. If the contest runs for 10 days, what is the total amount of money that the company will give away?

Q7: In a sports league, the ratio of wins to losses for Team A is 4:3, and the ratio of wins to losses for Team B is 7:2. If Team A has played 28 games and Team B has played 27 games, what is the ratio of Team A's winning percentage to Team B's winning percentage?

Q8: A pizza restaurant offers a "build your own pizza" option with a choice of 3 crusts, 5 sauces, 8 kinds of cheese, and 10 toppings. How many different possible pizzas can be created using one crust, one sauce, one cheese, and one topping?

Q9: A store sells three types of items: hats, shirts, and pants. Over the course of a week, the store sold 100 hats, 150 shirts, and 200 pants, and generated Rs. 5000 in revenue from hat sales, Rs. 7500 from shirt sales, and Rs. 12,000 from pants sales. Using matrix multiplication, find the average selling price of each item type. Assume that each item is sold for the same price throughout the week.

Section B-Long Answer

(12X3=36)

Note: Attempt any Three Questions; All questions carry equal marks

Q1: Solve the following system of linear equations using matrix inversion:

$$2x + y - z = 3$$

$$x - y + z = 4$$

$$3x + 2y + z = 1$$

Q2: Solve the following system of simultaneous linear equations using the Gaussian Elimination method.

$$2x + 3y - z = 7$$

$$x - 2y + 4z = -1$$

$$3x - y - 2z = 3$$

Q3: A company has a demand function given by $Q = 100 - 2P$, where Q is the quantity demanded and P is the price. The company's cost function is given by $C = 200 + 20Q$. Find the price that maximizes the company's profit.

Q4: The sum of the first 10 terms of an arithmetic progression is equal to the sum of the first 5 terms of a geometric progression. The first term of the arithmetic progression is 2, and the common ratio of the geometric progression is 3. Find the sum of the first 15 terms of the arithmetic progression.

Q5: (a) How many distinct permutations of the letters in the word "BANANA" are there? [4]

Q5: (b) In how many ways can a committee of 5 people be formed from a group of 8 men and 6 women, if the committee must have at least 2 men and at least 2 women? [8]

Q6: (a) A person invests Rs. 10,000 in a savings account that earns a fixed annual interest rate of 5% compounded quarterly for 2 years. Another person invests Rs. 10,000 in a savings account that earns a fixed annual interest rate of 6% compounded annually for 2 years. After 2 years, which person will have earned more interest, and by how much? [6]

Q6: (b) An investor plans to invest Rs. 20,000 for 5 years. She is considering two investment options:

Option A: Simple interest of 6% p.a. for the entire 5 year period.

Option B: Compound interest of 4% p.a. for the first 2 years, and 8% p.a. for the next 3 years.

Which investment option would give the investor a higher return, and by how much? [6]
