BACHELOR OF BUSINESS ADMINISTRATION
Second Semester
Quantitative Technique
(BBA-10)

Duration: 3Hrs.   **Full Marks: 70**

(PART-B: Descriptive)

Duration: 2 hrs. 40 mins.   **Marks: 50**

1 Attempt any Five Questions: **2×5=10**

a) Evaluate $\lim\limits_{x\to 1} \dfrac{x^2+2x+5}{x^2+1}$

b) Find the derivative of $\dfrac{x^3-2x^2+3x-2}{x^2}$

c) Integrate $\int \sqrt[3]{x}\ dx$

d) Given P (A) = 3/ 5 and P (B) = 1/5 find P (A∪B), if A and B are two mutually exclusive events.

e) What do you mean by objective function in LPP?

f) Define purposive sampling.

g) Define random experiment.

2. Attempt any Five Questions: **3×5=15**

a) Verify that $y = a.\,e^{2x} + b.\,e^{-x}$ is a solution of the differential equation

$$\frac{d^2y}{dx^2} - \frac{dy}{dx} - 2y = 0$$

b) Evaluate $\dfrac{d}{dx}\, e^{x^2} \log x$

c) Evaluate $\int_a^b \frac{x^2 - 5x + 6}{x - 2}\, dx$

d) Write the classical definition of probability with example.

e) Define three axioms of Probability.

f) A furniture dealer deals in only two items, tables and chairs. He has Rs 5000 to invest and a space to store at most 60 pieces. A table costs him Rs 250 and a chair Rs 50. He can sell a table at a profit of Rs 50 and a chair at a profit of Rs 15. Assuming that he can sell all the items that he can buy, how should he invest his money in order to maximise his profit. Formulate it as a linear programming problem.

g) What do you mean by Null and Alternative Hypothesis?

3. Attempt any Five Questions: 5×5=25

a) Find the extreme value of the equation $Y = 2x^2 - 16x + 5$. Draw the graph of the equation.

b) A bag contains 5 white, 3 black and 4 red balls. 2 balls are drawn at random. Find the probability that none of them are red?

c) Solve the following LPP by graphical method.

Maximise $Z = 20x + 30y$ Profit function

Subject to $2x + 5y \leq 50$ Material constraint

                $4x + 3y \leq 60$ Labour constraint

Where $x, y \geq 0$

d) What do you mean by Standard Error? Find the Standard Error of sample mean $\bar{x}$.

e) Draw a flowchart of the steps involved in OR problem.

f) Discuss in brief the scope of OR in management.

g) What do you mean by impossible event, certain event and exhaustive event? What are the probability of impossible event and certain event?

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(The figures in the margin indicate full marks for the questions)

Duration: 20 minutes   **Marks – 20**

PART A- Objective Type

I. Attempt all the questions. There are four alternatives for each question select the correct option.   1×20=20

1. $\lim_{x \to 0} \frac{e^x - 1}{x} = ?$

   a) 0   b) 1   c) -1   d) None of these

2. $\frac{d}{dx} x^0 = ?$

   a) 0   b) 1   c) -1   d) None of these

3. $\frac{d}{dx} u.v = ?$ Where u and v are any two functions.

   a) $v \frac{d}{dx} u + u. \frac{d}{dx} v$ b) $v \frac{d}{dx} u - u. \frac{d}{dx} v$ c) Both a) & b)   d) None of these

4. $\lim_{x \to 2} 5x^2 = ?$

   a) 20   b) -20   c) 10   d) None of these

5. $\int x^0 dx = ?$

   a) 0   b) 1   c) x   d) None of these

6.   If A and B are mutually exclusive events then P (AUB) =?

   a) P (A) + P (B)   b) P (A) - P (B)   c) P (A) + P (B) – P (AB)   d) None of these

7.   A bag contains 2 red, 2white and 2 black balls. What is the probability of drawing 2blue balls?

   a)1/6   b) 1   c) 0   d) None of these

8. The order and degree of the differential equation $(\frac{dy}{dx})^2 + 5y = 10x$ are $respectively$

    a) 1, 2   b) 2, 1   c) 2, 2   d) None of these

9. If A and B are mutually exclusive events then P $(A \cap B)$ =?

    a) 1   b) 2   c) 0   d) None of these

10. P $(\bar{A} \cap B)$ is known as the probability of occurrence of

    a) A only   b) B only   c) Both A & B   d) None of these

11. If A & B are two events associated to a random experiment such that $A \subset B$ then

    a) P $(A) \leq P(B)$ b) $P(A) \geq P(B)$ c) $P(A) = P(B)$ d) None of these

12. If E and F are two events such that P (E) = 1/4, P (F) =1/2 and P (E and F) = 1/8 then P (E or F) =?

    a) 2/8   b) 3/8   c) 5/8   d) None of these

13. In LPP the equation of objective function must be

    a) linear   b) Quadratic   c) Parabola   d) None of these

14. Strike out the odd one

    a) Objective function   b) Basic variable   c) Slack variable   d) Random variable

15. In LPP Slack variables are added into the constraints of the type _____

    a) $\leq$ b) $\geq$ $c) =$ d) None of these

16. Coefficient of the Surplus variable in Objective function is

    a) 0   b) 1   c) – 1   d) None of these

17. Non-negativity in LPP means

    a) x,y$\geq$ 0   b) x+y $\geq$ 0   c) x,y = 0   d) None of these

18. In sampling theory Type I error is

    a) Reject H_o, when it is true   b) Accept $H_{o, when}$ it is wrong   c) Both a) & b)   d) None of these

19. Pr (Accept a lot when it is bad) =?

    a) α b) β c) 1-β d) None of these

20. Value of Z at 5% level of significance is

    a) 1.96   b) 2.58   c) 3.58   d) None of these

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