18CSU03B

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BCom (CS) DEGREE EXAMINATION MAY 2022
(First Semester)

Branch –**CORPORATESECRETARYSHIP**

MATHEMATICS

Time: Three Hours Maximum: 50 Marks

SECTION-A (5 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks (5 x 1 = 5)

1. Find the simple interest on the sum of Rs 6000 at 20% p.a. for 4 years.
(i) Rs 1,800 (ii) 2,000 (iii) Rs 48,000 (iv) Rs 12,000

2. Find AB if $A = (3 \quad 5 \quad 6)$ and $B = \begin{pmatrix} 4 \\ 1 \\ 2 \end{pmatrix}$
(i)29 (ii)27 (iii)37 (iv)25

3. What is the value of $\frac{d}{dx}(logx)$
(i)x (ii)$\frac{1}{x}$ (iii))$\frac{x^2}{2}$ (iv)$logx$

4. Find $\int_0^2 x^2 dx$
(i)1/3 (ii)8 (iii)8/3 (iv)4

5. Any vector which satisfies the constraints of an LPP is called _____ of the LPP
(i) solution (ii) feasible solution
(iii) optimal solution (iv) solution space

SECTION - B (15 Marks)
Answer **ALL** Questions
ALL Questions Carry **EQUAL** Marks (5 x 3 = 15)

6. a) A certain sum amounts to Rs.4,000 at the end of 5 years at 12% p.a. interest. Calculate the sum.

(OR)

b) Find the compound interest on Rs.20,000 for 5 years at 20% per annum. And also calculate the simple interest.

7.a) If $A = \begin{bmatrix} 3 & 5 \\ 2 & a \end{bmatrix}, B = \begin{bmatrix} 4 & b \\ 2 & 9 \end{bmatrix}$ and $C = \begin{bmatrix} 26 & a \\ 14 & 45 \end{bmatrix}$, find a and b when $2A + 5B = C$.

(OR)

b) Find the inverse of $\begin{bmatrix} 1 & 0 & -1 \\ 3 & 4 & 5 \\ 0 & -6 & -7 \end{bmatrix}$

8. a) Find the derivative of $y = (x^2 + 5)(3x + 1)$

(OR)

b) If the demand law is $= \frac{20}{p+1}$, find the elasticity of demand at the point when p=3.

9. a) Evaluate $\int (x + \frac{1}{x})^2 dx$

(OR)

b) Evaluate $\int_0^1 \frac{xdx}{1+x^2}$

Cont...

10. a) A person requires at least 10,12 and 12 units of the chemicals A, B and C respectively for his garden. A liquid product contains 1, 2 and 4 units of A, B and respectively per jar. A dry product contains 5, 2 and 1 units of A, B and C per carton. The liquid product sells for Rs.3 per jar and the dry product sells for Rs.2 per carton. Formulate this as LPP for minimizing the cost and ensuring the requirement.

(OR)

b) Describe the canonical form of an LPP.

SECTION -C (30 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks (5 x 6 = 30)

11.a) A person has two daughters A and B aged 13 and 16 years. He has Rs.40,000 with him now but wants that both of them should get an equal amount when they are 20 years old. How he should divide the money if it were to be deposited in a bank giving 9% compound interest per annum?

(OR)

b) Find the true discount and the bankers discount on a bill whose present value is Rs.10,000 and which is due 4 months hence at 10% p.a. Calculate its face value ,cash value and banker's gain.

12.a) Solve the following system of simultaneous equations by Cramer's rule

$2x + 3y + 3z = 22$

$x - y + z = 4$

$4x + 2y - z = 9$

(OR)

b) Given the following transaction matrix, find gross output to meet the final demand of 300 units of agriculture and 900 units of industry.

Producing Sector	Purchasing Sector		Final demand
	Agriculture	Industry	
Agriculture	200	500	100
Industry	300	900	300

13. a) If $y = ax^2 + bx$ show that $x^2\frac{d^2y}{dx^2} - 2x\frac{dy}{dx} + 2y = 0$

(OR)

b) Calculate the value of x, in $2x^3 - 21x^2 + 36x - 20$, when it is maximum and minimum. Also find the maximum and minimum values.

14. a) Evaluate $\int \frac{x^3}{(x^2+1)^3} 3dx$

(OR)

b) Evaluate $\int \frac{1+x\log x}{x} e^x dx$

15. a) Solve by graphical method

Minimize $Z = -3x_1 + 4x_2$

Subject to $x_1 + x_2 \leq 4$

$2x_1 + 3x_2 \geq 18$

And $x_1, x_2 \geq 0$

(or)

b) Solve using simplex method

Maximize $Z = 5x_1 + 3x_2$

Subject to $x_1 + x_2 \leq 2$

$5x_1 + 2x_2 \leq 10$

$3x_1 + 8x_2 \leq 12$

And $x_1, x_2 \geq 0$

Z-Z-Z END