PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BCom DEGREE EXAMINATION DECEMBER 2023
(Second Semester)

Common to Branches – **COMMERCE (RM)/ COMMERCE (FS)/ COMMERCE (FT)**

MATHEMATICS FOR COMMERCE

Time: Three Hours | Maximum: 50 Marks

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

1 Find 5% of 200.
(i) 15 (ii) 10
(iii) 20 (iv) 25

2 A matrix A is said to be non singular if
(i) $|A| \neq 0$ (ii) $|A| = 0$
(iii) $|A| \neq 1$ (iv) $|A| = 1$

3 Find the derivative of the function $y = x^2 - 4$ with respect o x.
(i) $2x$ (ii) $2x - 4$
(iii) 0 (iv) -4

4 $\int u\,dv =$
(i) $uv + \int v\,du$ (ii) $uv + \int u\,dv$
(iii) $uv - \int v\,du$ (iv) $uv - \int u\,dv$

5 The variable added to make the inequality into equality is known as
(i) surplus variable (ii) slack variable
(iii) decision variable (iv) constraint variable

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

6 a Find the interest value of Rs. 2,000 due in 8 months at 12% simple interest.
OR
b Find the sum of all numbers between 200 and 400 divisible by 7.

7 a If $A = \begin{bmatrix} 2 & 3 \\ -1 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 0 & 2 \\ -2 & 3 & 1 \end{bmatrix}$ Find AB.
OR
b Find the inverse of $A = \begin{bmatrix} 2 & 2 \\ 3 & 5 \end{bmatrix}$.

8 a Find the derivative of $(x^2 - 7)^2$.
OR
b If the demand function is$p = 4 - 5x$ for that value of x will elasticity of demand be unitary?

9 a Integrate $x \log x$ with respect to x.
OR
b Integrate e^{7x} with respect to x.

10 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 Write Standard form of LPP.

Cont...

SECTION -C (30 Marks)

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

11 a Express 0.0444... as a fraction.

OR

b Find the sum of money required to buy a leasehold estate for 20 years yielding a return of Rs. 1200 per annum, if the compound interest rate is 6% per annum.

12 a Find the inverse of $A = \begin{bmatrix} 4 & 0 & 2 \\ 2 & 10 & 2 \\ 3 & 9 & 1 \end{bmatrix}$ by using Adjoint Matrix Method.

OR

b Solve $x + 2y - z = 2, 3x - 4y + 2z = 1, -x + 3y - z = 4$, using Crammer's Method.

13 a Find $\frac{dy}{dx}$ when $x = 4t, y = 2t^2$

OR

b The total cost function of a firm is given by $C = 0.04q^3 - 0.9q^2 + 10q + 10$. Find (i) Average cost and Marginal cost and (ii) Value of q at which average variable cost is minimum.

14 a Using partial fractions, Solve $\int \frac{dx}{(x-1)(x^2-5x+6)}$.

OR

b Prove that $\int_0^1 \frac{x\,dx}{1+x^2} = \frac{1}{2}\log 2$.

15 a Solve by graphical method: Maximize $Z = 3x_1 + 2x_2$ subject to $x_1 - x_2 \leq 1,\ x_1 + x_2 \geq 3$ and $x_1, x_2 \geq 0$.

OR

b Use simplex method to solve Maximize $Z = x_1 + x_2 + 3x_3$ subject to $3x_1 + 2x_2 + x_3 \leq 3,\ 2x_1 + x_2 + 2x_3 \leq 2$ and $x_1, x_2, x_3 \geq 0$.

Z-Z-Z END