PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BCom DEGREE EXAMINATION MAY 2023
(First Semester)

Branch – **COMMERCE**

MATHEMATICS

Time: Three Hours Maximum: 50 Marks

SECTION-A (5 Marks)

Answer **ALL** questions
ALL questions carry **EQUAL** marks (5 x 1 = 5)

1. The series 4, 2, 1, ... is
(i)A.P. (ii)H.P. (iii)G.P. (iv)None of them.

2. The simple interest is found as
(i)Pni (ii)Pnr (iii)P(1 +i) (iv)$P(1 + i)^n$

3. If A is a singular matrix, |A| =
(i)0 (ii)1 (iii)∞ (iv)None of them.

4. The derivative of 5^x is
(i) $5(5^x)$ (ii)$x\,(5^{x-1})$ (iii)5^x (iv)None of them.

5. "As soon as a new value for a variable is found by iteration, it is used immediately in the following equation". This method is called.
(i) Gauss – Seidel (ii)Jacobi's (iii)Gauss – Jordan (iv)Relaxation.

SECTION - B (15 Marks)

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

6. a) The fourth and seventh terms of an A.P. are 3 and 36. Find the A.P. and its fifteenth term.

(or)

b) Find the number of terms in the geometric series 0.03+ 0.06+ 0.12+...+1.92.

7. a) Calculate the total amount that will be received from the debtor when the principal Rs.10,000 is lent to him on interest for 4 years at 9% p.a.

(or)

b) Balu borrowed Rs.25,000 from Rathinam but could not repay the amount in a period of 5 years. Accordingly , Rathinam demands now Rs.35,880 from Balu. At what percent p.a. compound interest did Rathinam lend his money?

8. 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 value of the determinant $\begin{vmatrix}3 & -2 & 1\\ 2 & 3 & -1\\ 1 & 1 & 1\end{vmatrix}$.

9. a) Find the differential coefficient (derivative) of the function $y = x^2 - 4$ with respect to x.

(or)

Cont...

b) If the demand function is $p = 4 - 5x$, for what value of x will elasticity of demand be unitary?

10. a) Solve the system of equations by Gauss elimination methods.
$2x + 3y - z = 5,\ 4x + 4y - 3z = 3,\ 2x - 3y + 2z = 2$

(or)

b) Solve the system of equation by Gauss Jordan method
$10x + y + z = 12,\ 2x + 10y + z = 13,\ x + y + 5z = 7$

SECTION -C (30 Marks)

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

11. a) Find the four numbers forming a geometric progression if the first number exceeds the second by 36 and the third number is greater than the fourth by 4.

(or)

b) Find three numbers in A.P. whose sum is 12 and the sum of whose cubes is 408.

12. a) (i) Calculate the compound interest for Rs.2,500 for 4 years at 8% per annum.
(ii) Calculate the compound interest in the above case when interest is compounded (a) half yearly and (b) quarterly.

(or)

b) A bill for Rs.1,825 was drawn on 22nd January at 6 months date and discounted on 16th April at the rate of 10% per annum. Find the sum for which the bill was discounted and the banker's gain.

13. a) Solve the following equations by Cramer's rule $3x + 2y = 8,\ 5x - 3y = 7$.

(or)

b) Find the inverse of the matrix $A = \begin{vmatrix} 1 & 0 & -1 \\ 3 & 4 & 5 \\ 0 & -6 & -7 \end{vmatrix}$.

14. a) If $f(x) = \frac{x^3 - 2x^2 + 50}{x^2}$, find $f'(5)$ and $f'(10)$.

(or)

b) The demand curve for a monopolist is given by $x = 100 - 4p$.
(i) Find the total revenue, average revenue and marginal revenue.
(ii) At what level of x, then marginal revenue is equal to zero?

15. a) Using Gauss Jacobi method, solve
$x + y + 54z = 110,\ 27x + 6y - z = 85,\ 6x + 15y + 2z = 72$

(or)

b) Using Gauss Seidal method solve
$10x - 5y - 2z = 3,\ 4x + 10y + 3z = -3,\ x + 6y + 10z = -3$.

Z-Z-Z END