

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BCom (CS) DEGREE EXAMINATION DECEMBER 2024
(First Semester)

Common to Branches – **CORPORATE SECRETARYSHIP/ COMMERCE**

MATHEMATICS

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** marks

(10 × 1 = 10)

Question No.	Question	K Level	CO
1	Find the first and third term of the Arithmetic Progression are -3 and 3 respectively then the value of the common difference is a) 0 b) 1 c) 2 d) 3	K1	CO1
2	In a Geometric Progression, the second term is 12, and the fourth term is 48. What is the common ratio? a) 0 b) 2 c) 4 d) 6	K1	CO1
3	What is the formula for compound interest? a) $p \left(\left(1 + \frac{r}{100} \right)^n - 1 \right)$ b) $\frac{pnr}{100}$ c) $\frac{nr}{100}$ d) $p \left(1 + \frac{r}{100} \right)^n$	K1	CO2
4	The compound interest earned on ₹2,000 at 5% per annum for 2 years, compounded annually, is a) ₹100 b) ₹105 c) ₹205 d) ₹210	K1	CO2
5	If A is a 3x2 matrix B is a 2x3 matrix, then the order of the product matrix AB? a) 3x2 b) 2x3 c) 3x3 d) 2x2	K1	CO3
6	The determinant of the matrix $A = \begin{pmatrix} -1 & 1 \\ 2 & -2 \end{pmatrix}$ is a) 0 b) -1 c) 2 d) -2	K1	CO3
7	If $y = \log x$, then $\frac{dy}{dx}$ is a) x^{-2} b) x^{-1} c) x d) x^2	K1	CO4
8	The necessary condition to the function y attains its maximum or minimum a) $\frac{dy}{dx} = 0$ b) $\frac{dy}{dx} < 0$ c) $\frac{dy}{dx} > 0$ d) $\frac{dy}{dx} \neq 0$	K1	CO4
9	In the Gauss-Seidel method, the system of linear equations must be a) Symmetric b) Diagonally dominant c) Singular d) Positive definite	K1	CO5
10	Which of the following is the solution of the equation $4x + 2y = 2$ a) 0, 1 b) 1, 0 c) 1, 1 d) -1, -1	K1	CO5

Cont...

SECTION - B (35 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks (5 × 7 = 35)

Question No.	Question	K Level	CO
11.a.	The sum of three numbers in Arithmetic Progression is 24 and their product is 440. Find the numbers.	K2	CO1
	(OR)		
11.b.	Find the sum of all natural numbers between 100 and 1000 which are divisible by 13.	K2	CO1
12.a.	In how many years will Rs. 3610 amounts to 5234.50 at 9% simple interest?	K3	CO2
	(OR)		
12.b.	Find the compound interest on Rs. 20,000 for 5 years at 20% per annum. What will be the simple interest in the above case?	K3	CO2
13.a.	If $A = \begin{pmatrix} -1 & 2 \\ 1 & -3 \end{pmatrix}$ and $B = \begin{pmatrix} 8 & -1 \\ 5 & 7 \end{pmatrix}$, show that $3A - 3B = 3(A - B)$	K4	CO3
	(OR)		
13.b.	Solve the following equations by matrix method $3x + 2y = 14$, $x + y = 6$.	K4	CO3
14.a.	If $y = x^2 e^{2x}$, find $\frac{dy}{dx}$.	K4	CO4
	(OR)		
14.b.	Find $\frac{d}{dx} \left(\frac{x^2+1}{x^2-1} \right)$	K4	CO4
15.a.	Solve the following system by Gauss elimination method $x + y + z = 9$; $2x - 3y + 4z = 13$; $3x + 4y + 5z = 40$	K5	CO5
	(OR)		
15.b.	Solve the following system by Gauss-Jordan method $3x + 4y + 5z = 18$; $2x - y + 8z = 13$; $5x - 2y + 7z = 20$	K5	CO5

SECTION - C (30 Marks)

Answer ANY THREE questions

ALL questions carry EQUAL Marks (3 × 10 = 30)

Question No.	Question	K Level	CO
16	Find the first term of a Geometric Progression is 4 while its sum to infinity is 5. Find its sum to 8 terms	K2	CO1
17	The Bankers gain on a sum due 10 months hence at 6% p.a. is Rs. 25. Find the sum due.	K3	CO2
18	If $A = \begin{bmatrix} 1 & 0 & -2 \\ 2 & 2 & 4 \\ 0 & 0 & 2 \end{bmatrix}$, prove that $A^2 - 3A + 2I = 0$	K4	CO3
19	Find the second derivative of $(2x - 7)^4$ and its value when $x = 5$.	K4	CO4
20	Solve the following system of equations using Gauss-Seidel method $8x - 3y + 2z = 20$; $4x + 11y - z = 33$; $6x + 3y + 12z = 35$	K5	CO5