

(AUTONOMOUS)

BCom DEGREE EXAMINATION MAY 2026

(First Semester)

Branch - **COMMERCE**

MATHEMATICS

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** marks

$$(10 \times 1 = 10)$$

Question No.	Question	K Level	CO
1	The series 2,7,12, is an example for a) Sequence b) Arithmetic Progression c) Geometric Progression d) Harmonic Progression	K2	CO1
2	If the successive terms increase or decrease by a constant factor, the series is called _____. a) Sequence b) Arithmetic Progression c) Geometric Progression d) Harmonic Progression	K1	CO1
3	P(Principal amount) = Rs.6000, I (Interest amount) = Rs.1800, A(Amount) = ? a) Rs.7250 b) Rs.7500 c) Rs.7000 d) Rs.7800	K2	CO2
4	Compound Interest = _____. a) A-P b) A+P c) A*P d) A/P	K1	CO2
5	$A = \begin{bmatrix} 1 & 4 & 9 \\ 2 & 1 & 3 \\ 5 & 0 & 6 \end{bmatrix}$ is a square matrix of order _____. a) 2 b) 9 c) 3 d) 1	K2	CO3
6	Inverse of a matrix A exists if and only if A is _____. a) null matrix b) singular matrix c) Unit matrix d) non-singular matrix	K1	CO3
7	$\frac{d(e^x)}{dx} = \text{_____}$. a) x b) e^x c) xe^x d) 1	K2	CO4
8	Average cost = _____. a) $\frac{\text{Total cost}}{\text{Number of units}}$ b) $\frac{\text{Total revenue}}{\text{Number of units sold}}$ c) $\frac{\text{Price per unit}}{\text{Total revenue}}$ d) $\frac{\text{Number of units sold}}{\text{Total cost}}$	K1	CO4
9	The region common to all the constrain including the non-negativity restrictions is called _____. a) Optimum solution b) Basic solution c) Solution space d) Unique solution	K1	CO5
10	The Simplex method starts with an initial basic feasible solution for which _____. a) Z=1 b) Y=0 c) X=0 d) Z=0	K2	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.	If $\frac{1}{b+c}, \frac{1}{c+a}, \frac{1}{a+b}$ are in Arithmetic Progression (A.P), prove that a^2, b^2, c^2 are also in A.P.	K3	CO1
	(OR)		
11.b.	i) Are $\frac{7}{11}, \frac{7}{19}$ and $\frac{7}{27}$ in Harmonic Progression? ii) Insert two H.M.'s between 10 and 40.	K2	CO2
12.a.	The difference between the compound interest and the simple interest for 3 years at 5% p.a. on a certain sum of money was Rs. 610. Find the sum.		
	(OR)	K1	CO3
12.b.	A person wishes to collect Rs.1,20,000 for a house at the time of retirement due after 18 years. If the rate of compound interest is 6% per annum, how much should he deposit annually to receive this amount?		
13.a.	Find the products AB and BA of two matrices A and B where $A = \begin{bmatrix} 1 & 2 & 3 \end{bmatrix}$ and $B = \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$	K4	CO4
	(OR)		
13.b.	Find the inverse of $\begin{bmatrix} a & b \\ c & d \end{bmatrix}$.	K4	CO4
14.a.	Differentiate $x^2 \log_a x$ with respect to x.		
	(OR)	K4	CO5
14.b.	A firm sells a product at Rs. 3 per unit. The total cost of the firm for producing x units is given by $C = 20 + 0.6x + 0.01x^2$. How many units should be made to achieve maximum profit? .		
15.a.	Explain the steps involved in the formulation of Linear Programming Problem.	K4	CO5
	(OR)		
15.b.	Explain the steps of the graphical method.		

SECTION - C (30 Marks)

Answer ANY THREE questions

ALL questions carry EQUAL Marks

(3 × 10 = 30)

Question No.	Question	K Level	CO
16	A person is entitled to receive an annual payment which for each year is less by one tenth of what it was for the year before. If the first payment is Rs. 100, show that he cannot receive more than Rs. 1000 however long he may live.	K3	CO1
17	A certain amount of money was invested at 8% simple interest and after 9 months an equal amount was invested at 10% simple interest. Find the period in which the amount in each case becomes Rs. 2,600. How much money was invested in each case?	K4	CO2
18	If $A = \begin{bmatrix} 0.2 & 0.4 \\ 0.1 & 0.5 \end{bmatrix}$ and $B = \begin{bmatrix} 60 \\ 40 \end{bmatrix}$. Find X and V (value added).	K1	CO3
19	If $y = x e^{x^2}$, find $\frac{d^2y}{dx^2}$.	K2	CO4
20	Use simplex method to solve Max. $Z = x_1 + x_2 + 3x_3$ Subject to constraints $3x_1 + 2x_2 + x_3 \leq 3$ $2x_1 + x_2 + 2x_3 \leq 2$ and $x_1, x_2, x_3 \geq 0$.	K4	CO5