BACHELOR OF COMPUTER APPLICATIONS (BCA_NEW/BCAOL)

ASSIGNMENTS OF BCA_NEW/BCAOL PROGRAMME SEMESTER-I

(July 2026 & January 2027 Session)

BEVAE-181, BEGLA-136, BCS-111, BCSL-013, BCS-012

SCHOOLOFCOMPUTERANDINFORMATIONSCIENCES
INDIRA GANDHI NATIONAL OPEN UNIVERSITY
MAIDAN GARHI, NEW DELHI – 110 068

CONTENTS

Important Notes

1. BCA_NEW Student need to submit the assignments to the Coordinator of your Study Centre on or before the due date.
2. BCAOL Student need to submit the assignments on LMS Portal on or before thedue date.
3. Assignment submission before due dates is compulsory to become eligible for appearing in corresponding Term End Examinations. For further details, please refer to Programme Guide.
4. To become eligible for appearing the Term End Practical Examination for the lab courses, it is essential to fulfill the minimum attendance requirements as well as submission of assignments (on or before the due date). For further details, please refer to the Programme Guide.
5. The viva voce is compulsory for the assignments. For any course, if a student submitted the assignment and not attended the viva-voce, then the assignment istreated as not successfully completed and would be marked as ZERO.

Course Code	**:**	**BCS-012**
Course Title	**:**	**Basic Mathematics**
Assignment Number	**:**	**BCA_NEW/BCAOL(I)012/Assign/2026-27**
Maximum Marks	**:**	**100**
Last Date of Submission	**:**	**31st October,2026 (For July 2026 Session)**
	:	**30th April, 2027 (For January 2027 Session)**

Note: This assignment has 20 questions of 80 marks (each question carries equal marks). Answer all the questions. Answer all the questions. Rest 20 marks are for viva voce. You may use illustrations and diagrams to enhance explanations. Please go through the guidelines regarding assignments given in the Programme Guide for the format of presentation.

Q1: If $A = [3\ -1;\ 2\ 1]$, show that $A^2 - 4A + 5I_2 = 0$. Also find A^4.

Q2: Solve the following system of equations using the matrix inverse method:

$3x + 4y + 7z = 14$
$2x - y + 3z = 4$
$2x + 2y - 3z = 0$

Q3: Use the principle of mathematical induction to prove that:
$1/(1\times2) + 1/(2\times3) + \ldots + 1/[n(n+1)] = n/(n+1)$

Q4: If the p^{th} term of an A.P. is q and the q^{th} term of the same A.P. is p, find its r^{th} term.

Q5: How many terms of the G.P. $\sqrt{3}, 3, 3\sqrt{3}, \ldots$add up to 39?

Q6: Find the sum of all integers between 100 and 1000 that are divisible by 7.

Q7: If $1, \omega, \omega^2$ are the cube roots of unity, show that:$(2 - \omega)(2 - \omega^2)(2 - \omega^{19})(2 - \omega^{23}) = 49$

Q8: Use De Moivre's theorem to find the value of $(\sqrt{3} + i)^3$

Q9: If α and β are the roots of $x^2 - 3ax + a^2 = 0$, find the value of a when $\alpha^2 + \beta^2 = 7/4$.

Q10: If α and β are the roots of $2x^2 - 3x - 5 = 0$, form the quadratic equation whose roots are α^2 and β^2.

Q11: Solve the equation: $x^3 - 13x^2 + 15x + 189 = 0$, given that one root exceeds another by 2.

Q12: Solve the inequality and graph its solution: $2/(x - 1) > 5$

Q13: If $y = \log[(\sqrt{(1+x)} - \sqrt{(1-x)})/(\sqrt{(1+x)} + \sqrt{(1-x)})]$, find dy/dx.

Q14: If $y = ae^{mx} + be^{-mx}$, prove that: $d^2y/dx^2 = m^2y$

Q15: Determine the intervals in which $f(x) = x^4 - 8x^3 + 22x^2 - 24x + 21$ is increasing and decreasing.

Q16: Find the points of local maximum and local minimum of: $f(x) = x^3 - 6x^2 + 9x + 2014$

Q17: Evaluate: $\int x^2\sqrt{(5x-3)}\,dx$

Q18: Using integration, find the length of the curve $y = 3 - x$ from $(-1, 4)$ to $(3, 0)$.

Q19: Find the scalar component of projection of the vector $a = 2\hat{i} + 3\hat{j} + 5\hat{k}$ on the vector $b = 2\hat{i} - 2\hat{j} + \hat{k}$.

Q20: A tailor needs at least 40 large buttons and 60 small buttons. A box contains 6 large and 2 small buttons, and a card contains 2 large and 4 small buttons. If the cost of a box is $3 and the cost of a card is $2, formulate and solve the problem as a linear programming problem to minimize expenditure.