

# **BACHELOR OF COMPUTER APPLICATIONS (BCA\_NEW)**

**BCA\_NEW /ASSIGN/SEMESTER-I**

## **ASSIGNMENTS**

**(July-2025 & January 2026 Sessions)**

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



**SCHOOL OF COMPUTER AND INFORMATION SCIENCES  
INDIRA GANDHI NATIONAL OPEN UNIVERSITY  
MAIDAN GARHI, NEW DELHI – 110 068**

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### Important Notes

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<b>Course Code</b>	:	<b>BCS-012</b>
<b>Course Title</b>	:	<b>Basic Mathematics</b>
<b>Assignment Number</b>	:	<b>BCA_NEW(I)-012/Assignment/2025-26</b>
<b>Maximum Marks</b>	:	<b>100</b>
<b>Weightage</b>	:	<b>30%</b>
<b>Last Date of Submission</b>	:	<b>31<sup>st</sup> October,2025(For July 2025 Session) 30<sup>th</sup> April, 2026 (For January 2026 Session)</b>

**Note:** There are 5 questions in the following assignment carrying a total of 80 marks, Rest 20 marks are for viva-voce. Answer all the questions.

**Q1:** (a) Show that  $\begin{vmatrix} b+c & c+a & a+b \\ c+a & a+b & b+c \\ a+b & b+c & c+a \end{vmatrix} = 2 \begin{vmatrix} a & b & c \\ b & c & a \\ c & a & b \end{vmatrix}$  (2.5 Marks)

(b) If  $A = [2 \ -1 \ 3]$  and  $B = \begin{bmatrix} 1 \\ 3 \\ -1 \end{bmatrix}$  check  
Whether  $AB = BA$ . (2.5 Marks)

(c) Use the principle of mathematical induction to show that  $1+3+5+\dots+(2n-1)=n^2$  for each  $n \in \mathbb{N}$ . (2.5 Marks)

(d) If  $\alpha$  and  $\beta$  are roots of  $x^2 - 3ax + a^2 = 0$  and  $\alpha^2 + \beta^2 = \frac{7}{9}$ , find the value of  $a$ . (2.5 Marks)

(e) If  $y = ax + \frac{b}{x}$ , show that  $x^2 \frac{d^2y}{dx^2} + x \frac{dy}{dx} - y = 0$  (2.5 Marks)

(f) Evaluate the integral  $\int e^x (e^x + 7)^5 dx$ . (2.5 Marks)

(g) If  $\vec{a} = 5\hat{i} - \hat{j} - 3\hat{k}$  and  $\vec{b} = \hat{i} - 3\hat{j} - 5\hat{k}$ , show that  $\vec{a} + \vec{b}$  and  $\vec{a} - \vec{b}$  are perpendicular to each other. (2.5 Marks)

(h) Find the angle between the lines (2.5 Marks)  

$$\frac{x-5}{2} = \frac{y-5}{1} = \frac{z+1}{-1}$$
 and  $\frac{x}{3} = \frac{y-1}{2} = \frac{z+5}{3}$

**Q2:** (a) If  $A = \begin{bmatrix} -1 & 2 & 0 \\ -1 & 1 & 1 \\ 0 & 1 & 0 \end{bmatrix}$ , show that  $A^2 = A^{-1}$  (2.5 Marks)

(b) Show that  $A = \begin{bmatrix} 3 & 4 & -5 \\ 1 & 1 & 0 \\ 1 & 1 & 5 \end{bmatrix}$  is row equivalent to  $I_3$ , where  $I_3$  is identity matrix of order 3. (2.5 Marks)

(c) If  $A = \begin{bmatrix} 2 & 3 \\ -1 & 2 \end{bmatrix}$ , show that  $A^2 - 4A + 7I_2 = 0_{2x2}$ . Use this result to find (2.5 Marks)

$A^5$ . Where  $0_{2 \times 2}$  is null matrix of order  $2 \times 2$ .

**Q3:** (a) Solve the inequality  $\left| \frac{3x-1}{2} \right| \leq 5$ . **(2.5 Marks)**

(b) Solve the equation  $6x^3 - 11x^2 - 3x + 2 = 0$ , given that the roots are in H.P. **(5 Marks)**

(c) If  $x + iy = \sqrt{\frac{a+ib}{c+id}}$ , show that **(5 Marks)**  

$$(x^2 + y^2)^2 = \frac{a^2 + b^2}{c^2 + d^2}.$$

(d) If  $\alpha$  and  $\beta$  be the roots of the equation  $3x^2 - 4x + 1 = 0$ , find the equation whose roots are  $\alpha^2/\beta$  and  $\beta^2/\alpha$  **(5 Marks)**

**Q4:** (a) Determine the intervals in which the **(5 Marks)**

function  $f(x) = \frac{1+x+x^2}{1-x+x^2}$   $x \in \mathbf{R}$  is increasing or decreasing.

(b) Show that  $f(x) = x^2 \ln\left(\frac{1}{x}\right)$ ,  $x > 0$  has a local maximum at  $x = \frac{1}{\sqrt{e}}$  **(5 Marks)**

(c) Evaluate  $\int (x+1)e^x (xe^x + 5)^4 dx$ . **(5 Marks)**

(d) Find the area bounded by  $y = \sqrt{x}$  and  $y = x$ . **(5 Marks)**

**Q5:** (a) Find the vector and Cartesian equation of the line through the points  $(3, 0, -1)$  and  $(5, 2, 3)$ . **(5 Marks)**

(b) Show that  $[\vec{a} \times \vec{b} \quad \vec{b} \times \vec{c} \quad \vec{c} \times \vec{a}] = [\vec{a} \quad \vec{b} \quad \vec{c}]^2$  **(5 Marks)**

(c) Two tailors A and B, earn ₹ 150 and ₹ 200 per day respectively. **(5 Marks)**  
 A can stitch 6 shirts and 4 pants while B can stitch 10 shirts and 4 pants per day.  
 How many days should each work to stitch (at least) 60 shirts and 32 pants at least labour cost ? Also calculate the least cost.

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<b>Course Code</b>	<b>:</b>	<b>BCS-111</b>
<b>Course Title</b>	<b>:</b>	<b>Computer Basics and PC Software</b>
<b>Assignment Number</b>	<b>:</b>	<b>BCA_NEW(I)-111/Assignment/2025-26</b>
<b>Maximum Marks</b>	<b>:</b>	<b>100</b>
<b>Weightage</b>	<b>:</b>	<b>30%</b>
<b>Last Date of Submission</b>	<b>:</b>	<b>31<sup>st</sup> October,2025(For July 2025 Session) 30<sup>th</sup> April, 2026 (For January 2026 Session)</b>

**This assignment has three questions of 80 marks. 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. Please give precise answers. The word limit for each part is 200 words.**

**Q1:** **(5×6=30 Marks)**

- (a) Trace the evolution of computers from mechanical calculators to the fifth generation, and identify how each technological shift enabled a new kind of real-world application.
- (b) Draw a labelled diagram of the internal data flow in a digital computer and explain how instructions are fetched and executed using a practical example, such as calculating total marks.
- (c) Evaluate the impact of memory hierarchy (cache, RAM, secondary storage) on the performance of commonly used applications such as video editing or gaming.
- (d) Imagine you are designing a kiosk for railway ticket booking. Justify your selection of input and output devices based on user interaction, reliability, and efficiency.
- (e) You have ₹35,000 to assemble a personal computer for online learning and basic office work. List the hardware components you would choose and justify your selection based on performance and cost.

**Q2:** **(5×6=30 Marks)**

- (a) Compare proprietary and open-source software models by analyzing two software products (e.g., Microsoft Office vs. LibreOffice) in terms of cost, accessibility, updates, and support.
- (b) Assume your system has both Linux and Windows installed. Discuss three scenarios where Linux offers more control or flexibility compared to Windows, and explain why.
- (c) Reflect on how compilers and interpreters differ in handling programming errors. Provide an example where using an interpreter would be more beneficial during development.
- (d) Create a scenario (e.g., preparing an event budget) where both a word processor and spreadsheet are required. Describe how you would use each to accomplish the task effectively.
- (e) Design a simple database schema to store student attendance in a classroom. Mention tables, fields, and types. Also, mention one project management tool and how it can help in managing a classroom project.

**Q3:**

**(2×10=20 Marks)**

- (a) You have to set up a small office network with internet connectivity. Describe the networking devices (router, switch, etc.) and topology you would choose and justify your decision.
- (b) Suppose you are tasked with designing a personal learning portal. Identify three internet services you would integrate (e.g., cloud storage, video conferencing, email notifications) and justify their use.

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<b>Course Code</b>	<b>:</b>	<b>BCSL-013</b>
<b>Course Title</b>	<b>:</b>	<b>Computer Basics and PC Software Lab</b>
<b>Assignment Number</b>	<b>:</b>	<b>BCA_NEW(I)-L-013/Assignment/2025-26</b>
<b>Maximum Marks</b>	<b>:</b>	<b>100</b>
<b>Weightage</b>	<b>:</b>	<b>30%</b>
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**The assignment has two parts A and B. Answer all the questions. Each part is for 20 marks. WINDOWS and LINUX lab record carries 40 Marks. Rest 20 marks are for viva voce. You may use illustrations and diagrams to enhance the explanations. Please go through the guidelines regarding assignments given in the PGDCA Programme Guide for the format of presentation. If any assumptions made, please state them.**

**Q1:** Answer the following in the context of the Linux Operating System. You must write all the commands that you have used to answer the questions. Also, attach a printout OR a file (may be in PDF format) containing the screenshots of the output.

**a)** Write and run the following Linux commands and attach the screenshots of the output of each command. **(10 marks)**

- i) date
- ii) man
- iii) mv
- iv) ln
- v) chmod
- vi) find
- vii) diff
- viii) tail
- ix) pwd
- x) grep

**b)** Create a text file in Linux consisting of 10 lines. Create a copy of this file. Count how many times the word “a” appeared in this file. Display the file permissions of the file created by you. Now, change the file permissions of this file to rw-rw-rw-. **(6 Marks)**

**Q2:** Create a presentation using any Presentation software on the topic “Importance of JavaScript in Web Development” (minimum 10 slides). The slides should have the following features: **(16 Marks)**

- i) All slides should use a common design template.
- ii) Add an audio file to a slide. Also, add a video file that should run in full-screen mode.
- iii) All the slides should have timer-based transitions.
- iv) All the slides should have proper headings and slide notes.
- v) Each slide should have one image related to the topic.

Write the sequence of steps that you have performed to create these slides. Also, attach a printout OR a file (may be in PDF format) containing the handout of all the slides (6 slides per page).

**Q3:**

- a)** Use a Word Processor to create a document about the BCA programme. It should include (i) a multi-level list highlighting the courses and topics under those courses; (ii) a table consisting of the course name, credits, and the semester of the course; (iii) a paragraph about the objectives of the BCA programme. **(6 Marks)**
- b)** Design a flyer on the topic “Advantages of Online Banking”. Use different styles, sizes, fonts, colours and effects. **(10 Marks)**

Write the sequence of steps that you have performed to create the document and flyer. Also, attach a printout OR a file (may be in PDF format) containing the document and flyer.

**Q4:** Create a worksheet containing the Sales data of a company as given in the following table: **(16 Marks)**

Salesperson Name	Annual Sales in Numbers (N)	Price of each Item (P)	Gross Sales in INR (G)	Discount (10% of G) (D)	Net Sales in INR (NS)	GST (10% of NS)	Amount Receivable with GST (R)
Aana	50000	50					
Mohan	65000	45					
Shyama	60000	36					
Hasan	50000	49					
Deep	45000	54					
Roger	30000	65					

You must enter all the labels and details as given above. You may use the following formulae:

$$G = N * P$$

$$D = 10\% \text{ of } G$$

$$NS = G - D$$

$$GST = 10\% \text{ of } NS$$

$$R = NS - GST$$

Write the sequence of steps that you have performed to create the formulae in different cells. Also, attach a printout OR a file (may be in PDF format) containing the worksheet.

**Q5:** Use MS Outlook or any other email software to perform the following tasks: **(16 Marks)**

- a)** Make a weekly meeting schedule for a group meeting along with two other friends about the agenda, “Birthday Planning”. This weekly meeting should be scheduled for two consecutive weeks.
- b)** Write an email to your friends (at least 5) inviting them to attend your Birthday. Make your Signature and add it to the e-mail message.
- c)** Create a message that should be sent to all the emails received by you on the 1<sup>st</sup> of January 2026.

- d) A person is sending several e-mails to you that you want to delete automatically. Configure your mail account to achieve this functionality.

Make and state suitable assumptions, if any.

Write the sequence of steps that you have performed in different parts of this question. Also, attach a printout OR a file (may be in PDF format) containing the screenshots of the output.

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<b>Course Code</b>	<b>:</b>	<b>BEGLA-136</b>
<b>Course Title</b>	<b>:</b>	<b>English at Work Place</b>
<b>Assignment Number</b>	<b>:</b>	<b>BCA_NEW(I)-136/Assignment/2025-26</b>
<b>Maximum Marks</b>	<b>:</b>	<b>100</b>
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### **SECTION A**

**Q1:** Write short notes on the following:

**(5x4=20 Marks)**

- a) Difference between a portfolio and resume
- b) Common Gender Perceptions
- c) Workplace Etiquette
- d) Importance of Good Customer Service

### **SECTION B**

**(10x5=50 Marks)**

**Q1:** Write a short paragraph describing any person from your institution/workplace.

**Q2:** List a few common body gestures and explain what each one communicates or signifies.

**Q3:** Make a presentation for your organization on sustainable workplace practices.

**Q4:** You are interested in applying for the position of a marketing executive in a company. Write a covering letter for this position, showing how you are suitable for the job.

**Q5:** Discuss the characteristics of work Ethics by giving suitable examples.

### **SECTION C**

**(15x2=30 Marks)**

**Q1:** Create a Curriculum Vitae (CV) for your desired job, clearly highlighting your educational qualifications, professional experience, achievements, and other relevant details tailored to the position.

**Q2:** You are preparing for an interview for the position of a Research Analyst at a reputed institution. List ten likely interview questions along with your well-thought-out answers.

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<b>Course Code</b>	<b>:</b>	<b>BEVAE-181</b>
<b>Course Title</b>	<b>:</b>	<b>Environmental Studies</b>
<b>Assignment Number</b>	<b>:</b>	<b>BCA_NEW(I)-181/Assignment/2025-26</b>
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**Note:** Attempt all questions. The marks for each question are indicated against it.

### **PART-A**

- Q1:** “To achieve the desired goal of Sustainable Development, societies have to make certain transitions which are very much essential.” Justify the statement in about 250 words **(8 Marks)**
- Q2:** Differentiate between the following terms by giving suitable examples in about 125 words **(4 x 2= 8 Marks)**
- (a) Primary and secondary succession
  - (b) Direct and indirect use value of biodiversity
- Q3:** Answer the following questions in about 150 words each. **(5 x 4= 20 Marks)**
- (a) What is biodiversity hotspot? Why is India considered as a mega biodiversity hotspot?
  - (b) Describe the life forms of aquatic ecosystem found in different zones with suitable examples and diagrams.
  - (c) Differentiate between the surface and ground water. Describe the factors responsible for degradation of water.
  - (d) Write a short note on carbon cycle with the help of a diagram.
- Q4:** How does Forest Right Act, 2006 helps tribal and forest dwellers in India? Explain with suitable examples in about 200 words. **(7 Marks)**
- Q5:** Critically evaluate the status of non-conventional energy resources in India. Elucidate your answer with suitable examples in about 200 words. **(7 Marks)**

### **PART-B**

- Q6:** Explain the following terms in about 60 words each: **(2x4=8 Marks)**
- (a) Ecofeminism
  - (b) Geographical and Social Inequity
  - (c) Ozone Layer Depletion
  - (d) Acid Rain
- Q7:** Answer the following questions in about 150 words each. **(5 x 4= 20 Marks)**
- (a) Explain any four impacts of improper waste disposal with suitable examples.

- (b) How does Landfilling act as an important method of waste disposal? Explain.
- (c) Describe the role of Central Pollution Control Board (CPCB) as an institution for monitoring the pollution levels of environment.
- (d) How do collective actions help in addressing environmental issues and concerns? Explain.

**Q8:** “Habitat destruction is recognized as most significant threat to global biodiversity.” Elucidate the statement with respect to present day context in about 200 words. **(7 Marks)**

**Q9:** ‘Polluted water is a threat to our health and survival of life forms’ Explain it with respect to different agents of water pollutants in about 200 words. **(7 Marks)**

**Q10:** “The ratio of those killed to those affected by natural disasters depend on the type of calamity, degree of preparedness and the density of population” Justify the statement with Explain your answer with suitable arguments and examples in about 250 words. **(8 Marks)**