

Nalanda Open University
Annual Examination - 2023
Bachelor in Computer Application (BCA), Part-I
Paper-I [Communicative English]

Time: 3.00 Hrs.

Full Marks: 80

Answer any five questions. All questions carry equal marks.

1. What do you mean by horizontal Communication ?
2. What are the different types of Register ?
3. Write a prepared speech on 'Work is Worship'
4. Discuss the different forms of a report.
5. Point out the advantages and limitations of Written Communication.
6. Write a brief note on the seven 'C' s of practical communication.
7. Write a note on barriers of Communications and their solutions.
8. What do you understand by reading techniques ?



EXAMINATION PROGRAMME-2023
BCA, Part-I

Date	Papers	Time	Examination Centre
02.09.2023	BCA, Paper-I	10.30 AM to 1.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
04.09.2023	BCA, Paper-II	10.30 AM to 1.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
08.09.2023	BCA, Paper-III	10.30 AM to 1.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
12.09.2023	BCA, Paper-IV	10.30 AM to 1.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
14.09.2023	BCA, Paper-V	10.30 AM to 1.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
16.09.2023	BCA, Paper-VI	10.30 AM to 1.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
19.09.2023	BCA, Paper-VII	10.30 AM to 1.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
21.09.2023	BCA, Paper-VIII	10.30 AM to 1.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
22.09.2023	BCA, Paper-V (Practical)	from 10.30 AM	School of Computer Education & IT, 12th Floor, Biscomaun Tower, Patna-800001
23.09.2023	BCA, Paper-VI (Practical)	from 10.30 AM	

Nalanda Open University

Annual Examination - 2023

Bachelor in Computer Application (BCA), Part-I

Paper-II (Foundation Course in Social and Environmental Science)

Time: 3.00 Hrs.

Full marks: 80

Answer any **Five** questions. *Question No. 1 is compulsory.*

किन्हीं पाँच प्रश्नों के उत्तर दीजिए । प्रश्न संख्या 1 अनिवार्य है ।

1. (a) Tick (✓) the correct answer or Cross (×) the wrong answer against each of the following sentences. (16x1=16)

अधोलिखित में से प्रत्येक के सामने सही (✓) अथवा गलत (×) जैसी स्थिति हो, का चिह्न लगायें।

- (i) Social Science is the branch of science that deals with socio-cultural aspect of human behaviour. (True/False)

समाज विज्ञान, विज्ञान की एक शाखा है जो मानव-आचरण के सामाजिक-सांस्कृतिक पहलू का अध्ययन करता है । (सही/गलत)

- (ii) Pre-historians suspect that Homo habilis was killed by zinathropous who used tools. (True/False)

प्रागैतिहासकारों को आशंका है कि होमो हैबिलिस जिनजनथ्रोपस द्वारा, जो औजारों का इस्तेमाल करते थे, मार दिए गए। (सही/गलत)

- (iii) Germany is regarded as the Birth place of Renaissance. (True/False)

जर्मनी को पुनर्जागरण काल की जन्म स्थली माना जाता है। (सही/गलत)

- (iv) Every Hindu necessarily belongs to the caste of his/her parents. (True/False)

प्रत्येक हिन्दू आवश्यक रूप से अपने/अपनी माता-पिता की जाति वाला होता है। (सही/गलत)

- (v) Dandi March led by Mahatma Gandhi was to break the Salt Laws imposed by the British Government. (True/False)

महात्मा गाँधी की अगुआई में आयोजित डाँडी मार्च ब्रिटिश सरकार द्वारा अधिरोपित नमक कानून को तोड़ने हेतु था। (सही/गलत)

- (vi) The Constitution of Free India came into force on 15th August 1947. (True/False)

स्वतंत्र भारत का संविधान 15 अगस्त 1947 से प्रभाव में आया । (सही/गलत)

- (vii) Micro, small and Medium Enterprise (MSME) Act became effective from October 2, 2006. (True/False)

एम.एस.एम.ई. अधिनियम 2 अक्टूबर, 2006 से प्रभाव में आया । (सही/गलत)

- (viii) NITI (national Institution for Transforming India) Ayog was established by the NDA government in 2015. (True/False)

नीति आयोग की एन०डी०ए० सरकार द्वारा वर्ष 2015 में स्थापना हुई । (सही/गलत)

- (b) Fill in the blanks with appropriate word/term.

रिक्त स्थानों की पूर्ति उचित शब्द/पद से करें।

- (i) The sum total of Various types of life forms animals, plants and micro-organisms on our planet is termed.....

हमारे ग्रह (पृथ्वी) पर उपस्थित विभिन्न प्रकार के जीवों-जानवरों, वनस्पतियों एवं सूक्ष्मजीवों के समूह कोकहा जाता है ।

- (ii) World Environment Day is celebrated onJune every Year.

विश्व पर्यावरण दिवस प्रत्येक वर्षजून को मनाया जाता है ।

- (iii) The two important natural radioactive elements are, and

दो प्रमुख प्राकृतिक रेडियोसक्रिय तत्व हैं और

- (iv) SPM is a term used in the study of pollution.

एस.पी.एम. एक पद है जिसका उपयोग.....प्रदूषण के अध्ययन में होता है ।

- (v) is an example of a natural disaster affecting large population of North Bihar almost every year.

.....प्राकृतिक आपदा एक उदाहरण है जो प्रायः प्रति वर्ष उत्तरी बिहार की एक बड़ी आबादी को प्रभावित करता/करती है ।

P.T.O...

- (vi) Eutrophication is a term related to study of..... pollution.
सुपोषण एक पद है जिसका सम्बन्ध.....प्रदूषण से होता है ।
- (vii) During Photosynthesis green leafy plants consume.....and release.....gases.
प्रकाश संश्लेषण के दरम्यान हरी पत्तेदार पौधे.....ग्रहण करते हैं और.....गैसों से मुक्त करते हैं ।
- (viii) Intensity of Earthquake is measured on scale.
भूकम्प की तीव्रता को.....स्केल पर मापा जाता है ।
2. Discuss the importance of Environment on social life of a man.
परिवेश का मनुष्य के सामाजिक जीवन पर पड़ने वाले प्रभाव की महत्ता की विवेचना कीजिए ।
 3. Write an essay on the impact of Renaissance.
पुनर्जागरण काल के प्रभाव पर एक निबन्ध लिखिए ।
 4. Describe the nature and outcome of the revolt of 1857.
1857 के विद्रोह की प्रकृति एवं इसके नतीजों का वर्णन कीजिए ।
 5. Write a descriptive note on Election Commission of India and its responsibilities.
भारत के चुनाव आयोग और इसकी जिम्मेदारियों पर विवरणात्मक टिप्पणी लिखिए ।
 6. Give a descriptive account of 'Make in India' campaign launched by the NDA Government.
एनडीए सरकार द्वारा प्रारंभ किये गये 'मेक इन इंडिया' अभियान के बारे में वर्णनात्मक विवरण प्रस्तुत कीजिए ।
 7. How would you define a natural resource? Why are forests important to us?
आप 'प्राकृतिक संसाधन' पद को किस प्रकार परिभाषित करेंगे ? वन हमारे लिए क्यों महत्वपूर्ण हैं ?
 8. What is Ecosystem? Describe in detail either forest ecosystem or pond ecosystem.
परिस्थितिक तंत्र क्या है? वन परिस्थितिक तंत्र और तालाब परिस्थितिक तंत्र से किसी एक का विस्तार से वर्णन कीजिए ।
 9. Distinguish between Renewable and Non-renewable energy resources. Why it is essential to work for renewable energy resources?
नवीकरणीय एवं अनवीकरणीय ऊर्जा संसाधनों में अन्तर बताइए। नवीकरणीय ऊर्जा संसाधनों पर कार्य करना क्यों आवश्यक है?
 10. Write short notes on any **Two** of the following:-
निम्नलिखित में से किन्हीं **दो** पर टिप्पणी लिखिए:-
 - (a) Biodegradable Waste (जैव निम्नीकरणीय कचरा)
 - (b) Noise Pollution (ध्वनि प्रदूषण)
 - (c) Smog (स्मॉग)
 - (d) Rainwater harvesting (वर्षाजल संग्रहण)



Nalanda Open University
Annual Examination - 2023
Bachelor in Computer Application (BCA), Part-I
Paper-III [Fundamental of IT]

Time: 3.00 Hrs.

Full Marks: 80

Answer any five questions. All questions carry equal marks.

1. Define Computers. Describe the characteristics of Computer system in detail.
2. Describe classification of computers on the basis of their size, processing speed and cost.
3. Compare and contrast between Structured programming and Object Oriented Programming. Give examples of each.
4. Define Operating system. Describe different types of Operating systems.
5. What is internet? Why is internet surfing done? Explain various hardware and software required for an internet connection.
6. How does a computer system handle interrupts? Also explain how interrupts can be handled quickly?
7. Discuss some Input devices used in computers with their functions.
8. Explain different storage devices used in computers for storing the data with suitable examples. How is drive performance measured of optical storage measured? Discuss in brief.
9. What is project management software? Explain.
10. Write short notes on any **two** of the following:
 - a. Transmission media.
 - b. FTP
 - c. Multitasking
 - d. Output devices

EXAMINATION PROGRAMME-2023
BCA, Part-I

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23.09.2023	BCA, Paper-VI (Practical)	from 10.30 AM	

NALANDA OPEN UNIVERSITY
Bachelor of Computer Application (BCA), Part-I
PAPER–IV (Mathematics)
Annual Examination, 2023

Time : 3 Hours.

Full Marks : 80

*Answer any **Five** Questions. All questions carry equal marks.*

1. (a) If $u = \{1, 2, 3, 4, 5, 6, 7, 8\}$, $A = \{1, 2, 3, 4\}$, $B = \{2, 4, 6\}$, $C = \{1, 2, 5\}$ then find
 (i) $A \cap (B - C)$ (ii) $A \cup (B \cap C)$ (iii) $A^1 \cup (B - C)$
 (b) If 60% students in a class offered Biology and 75% Students offered Mathematics, how many % of students offered both Biology and Mathematics if any students have offered either mathematics or Biology.

2. (a) Prove that
$$\begin{vmatrix} a-b-c & 2a & 2a \\ 2b & b-c-a & 2b \\ 2c & 2c & c-a-b \end{vmatrix} = (a+b+c)^3$$

 (b) Find AB and BA if

$$A = \begin{bmatrix} 2 & 1 & 4 \\ 3 & 2 & 1 \\ 1 & 3 & 2 \end{bmatrix} \quad B = \begin{bmatrix} 3 & -1 & 2 \\ 2 & 1 & 3 \\ -1 & 4 & 2 \end{bmatrix}$$

3. (a) Find the first term and common difference of the progression where 8th and 102nd terms are respectively 23 and 305.
 (b) Find the sum upto n terms $S=3+33+333+$ upto n terms.

4. (a) Find x and y which satisfy $(x+iy)(2-3i)=4+i$
 (b) If W be an imaginary cube roots of unity then show that
 $(1 - w + w^2)(1 - w^2 + w^4)(1 - w^4 + w^8)(1 - w^8 + w^{16}) = 16$.

5. Solve the equation by Cardano's method $2x^3 + 3x^2 + 4x + 1 = 0$.

6. (a) Find the differential coefficient of $\sin x$ with respect to x with the help of first principle.
 (b) If α and β are the root of $x^2 - px + q = 0$ find the value of
 (i) $\alpha^2 + \beta^2$ (ii) $\alpha^3 + \beta^3$

7. Find the differential coefficient of the following :—
 (a) $y = \cos \sqrt{\sin \sqrt{x}}$ (b) $y = \left(\sqrt{x} - \frac{1}{\sqrt{x}} \right)^2$ (c) $y = e^{\tan^{-1}(x^2)}$

8. Integrate the following with respect to x
 (a) $\int \frac{\cos 2x - \cos 2\alpha}{\cos x - \cos \alpha} dx$ (b) $\int \frac{\sin \sqrt{x}}{\sqrt{x}} dx$ (c) $\int \frac{(x^3 - 8)(x + 1)}{x^2 + 2x + 4} dx$

9. Find the equation of the circle which passes through the point (1, 1), (2, 1) and (3, 2).

10. Evaluate $\left[(i)^{17} - \left(\frac{1}{i} \right)^{34} \right]^2$



Nalanda Open University
Annual Examination - 2023
Bachelor in Computer Application (BCA), Part-I
Paper-V [Programming Methodology using C]

Time: 3.00 Hrs.

Full Marks: 80

Answer any five questions. All questions carry equal marks.

1. What is an algorithm? Describe the properties of an algorithm. Write an algorithm to find greater of two numbers entered from the keyboard.
2. Explain various data types used in C programming. Give suitable examples for each.
3. Describe at least 10 keywords in C with their uses. Give examples for each.
4. How strings are handled in C language. Explain with the help of an example.
5. Explain decision control statements in C with examples.
6. Define arrays? How many types of arrays are there? Write a program in C using arrays.
7. Write a program in C using functions. Differentiate between call by value and call by reference with the help of an example.
8. What are pointers? Write a program using pointers. How it is different from arrays? Explain with the help of an example.
9. Discuss various types of operators used in C with examples.
10. Write short notes on any **two**:
 - (a) Variables
 - (b) Looping in C
 - (c) Structures
 - (d) Flowchart

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EXAMINATION PROGRAMME-2023
BCA, Part-I

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Nalanda Open University
Annual Examination - 2023
Bachelor in Computer Application (BCA), Part-I
Paper-VI [PC Software and Office Automation]

Time: 3.00 Hrs.

Full Marks: 80

Answer any five questions. All questions carry equal marks.

1. Why office automation is important today? What is the use of Control Panel? Discuss at least six important components of the Control Panel.
2. Define Notepad. What are its basic features? How Notepad is different from WordPad. Explain.
3. What is MS-Paint? Describe the components of MS Paint with their utilities.
4. Describe at least five features of MS-Word. What is Header, footer, bullets and Numbering in MS-Word?
5. Define Mail merge in MS-Word. Explain how documents are created and merged in Mail merge. How mail merge is different for macro?
6. Differentiate between WordArt and ClipArt in MS-Word. What is cropping a picture in MS-Word?
7. Define MS-Excel. Discuss the features of MS-Excel. Explain formulas and filters in MS-Excel.
8. What is PowerPoint? Describe the elements of PowerPoint Presentation. What are templates in PowerPoint?
9. What is Internet? How Internet is helpful in making presentation. What are the components present on a Taskbar.
10. Write short notes on any **two**:
 - (a) Multimedia
 - (b) My computer
 - (c) Recycle bin
 - (d) Spell Check.



EXAMINATION PROGRAMME-2023
BCA, Part-I

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Nalanda Open University
Annual Examination - 2023
Bachelor in Computer Application (BCA), Part-I
Paper-VII [Computer Organisation]

Time: 3.00 Hrs.

Full Marks: 80

Answer any five questions. All questions carry equal marks.

1. Convert the following:
 - (i) $(1100110101)_2$ to its $()_{10}$.
 - (ii) $(2476)_8$ to Hexadecimal number.
 - (iii) $(6443)_{10}$ to its Binary equivalent.
 - (iv) $(CAB129)_{16}$ to Octal number
2. Simplify the following Boolean function using Sum-of-Product form, by Karnaugh's map: $F(A, B, C, D) = \Sigma(0, 1, 2, 5, 6, 8, 9, 10, 11, 15)$. Also draw the circuit diagram for it.
3. Explain Universal gates with examples. Draw all the fundamental gates using Universal gates.
4. Draw a circuit diagram for the following expressions:
 - (i) $\sim ABC + A\sim D + AD$
 - (ii) $\sim A + \sim C + BC + \sim(C\sim D)$
 - (iii) $\sim(ABC + \sim(AC))$
 - (iv) $((B\sim D)BC) + A + C + \sim D$
5. Draw and explain any three combinational circuits with their truth tables.
6. Differentiate between SR flip-flop and JK flip-flop with their circuit diagram.
7. Explain various types of memories used in Computers.
8. Define Instruction. Explain different types of Instructions with examples.
9. Define Control Unit (CU). Why it is used? Describe CU organization with diagram.
10. Write short notes on any **two** of the following:
 - a. Registers
 - b. CPU
 - c. Interrupts
 - d. Von Neumann Architecture



EXAMINATION PROGRAMME-2023
BCA, Part-I

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Nalanda Open University
Annual Examination - 2023
Bachelor in Computer Application (BCA), Part-I
Paper-VIII [System Analysis and Design]

Time: 3.00 Hrs.

Full Marks: 80

Answer any five questions. All questions carry equal marks.

1. What is a System? What are the characteristics of a System? Describe classification of System with examples.
2. Describe System Development Life Cycle (SDLC)? What is the use of SDLC?
3. Define Data Flow Diagram (DFD)? What are the components of a DFD? Draw a DFD for a “Hotel Management System”.
4. What is modularity? Differentiate between logical and physical design.
5. What is Input design? Discuss the import points that should be considered during Input design. How it is different from output design?
6. How Forms are different from Reports? Discuss the importance of Forms and Reports. Discuss the process of designing Forms and Reports.
7. What is the use of documentation? Discuss different types of documentations.
8. Explain different types of testing with examples. Why testing is important? Explain.
9. Define ER diagram? What are the components of ER diagram? Draw an ER diagram for “Banking system”.
10. Write short notes on any **two** of the following:
 - a. Data Dictionary
 - b. Decision table
 - c. System Analyst
 - d. Design Principles.



EXAMINATION PROGRAMME-2023
BCA, Part-I

Date	Papers	Time	Examination Centre
02.09.2023	BCA, Paper-I	10.30 AM to 1.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
04.09.2023	BCA, Paper-II	10.30 AM to 1.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
08.09.2023	BCA, Paper-III	10.30 AM to 1.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
12.09.2023	BCA, Paper-IV	10.30 AM to 1.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
14.09.2023	BCA, Paper-V	10.30 AM to 1.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
16.09.2023	BCA, Paper-VI	10.30 AM to 1.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
19.09.2023	BCA, Paper-VII	10.30 AM to 1.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
21.09.2023	BCA, Paper-VIII	10.30 AM to 1.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
22.09.2023	BCA, Paper-V (Practical)	from 10.30 AM	School of Computer Education & IT, 12th Floor, Biscomaun Tower, Patna-800001
23.09.2023	BCA, Paper-VI (Practical)	from 10.30 AM	

Annual Examination - 2023
Bachelor in Computer Application (BCA), Part-I
Paper-V, Programming Methodology using C (Computer Practical)

Time: 2.00 Hrs.

Full Marks: 20

Answer any two questions. All questions carry equal marks.

1. Write a program in C language to generate a Fibonacci series up to 10th term.
2. Write a program to generate the following pattern below:
**

3. Write a program in C language to display whether the entered number is a perfect square.

❧❧❧

Annual Examination - 2023
Bachelor in Computer Application (BCA), Part-I
Paper-V, Programming Methodology using C (Computer Practical)

Time: 2.00 Hrs.

Full Marks: 20

Answer any two questions. All questions carry equal marks.

1. Write a program in C language to find the factorial of a given number.
2. Write a program to generate the following pattern below:

**
3. Write a program in C language to print the sum of the squares of 10 odd numbers.

❧❧❧

Nalanda Open University

Set-I

Annual Examination - 2023

Bachelor in Computer Application (BCA), Part-I

Paper-VI, PC Software and Office Automation (Computer Practical)

Time: 2.00 Hrs.

Full Marks: 20

Answer any two questions. All questions carry equal marks.

1. Perform the following tasks using MS-Word document:
 - (a) Create a document with proper header and footer.
 - (b) Set margin to the document and insert a watermark.
 - (c) Change the paragraph spacing to 10 pt. (before and after) and line spacing to 1.5 lines.
 - (d) Create a macro using keyboard option.

2. Perform the following tasks using MS -EXCEL:
 - (a) Create a mark-sheet of BCA for 10 students with roll-no, name, marks, Total, average, percentage and grades as follow:
 - i) if percentage ≥ 80 then Grade "A"
 - ii) if percentage ≥ 70 then Grade "B"
 - iii) if percentage ≥ 60 then Grade "C"
 - iv) if percentage ≥ 50 then Grade "D" else "FAIL"
 - (b) Create a chart for the mark-sheet.
 - (c) Give a proper heading to the chart.

3. Create a PowerPoint presentation of 10 slides of your own choice. The presentation should consist of pictures, animation effects and good color combination of the texts.



Nalanda Open University

Set-II

Annual Examination - 2023

Bachelor in Computer Application (BCA), Part-I

Paper-VI, PC Software and Office Automation (Computer Practical)

Time: 2.00 Hrs.

Full Marks: 20

Answer any two questions. All questions carry equal marks.

Answer any two questions .All questions carry equal marks.

1. Perform the following tasks using MS-Word document:
 - (a) Write the advantages of BCA course in tabular form.
 - (b) Insert a hyperlink in the document.
 - (c) Change the color of the font to red and Times New Roman size 12 point.
 - (d) Create a macro using toolbar option.

2. Create an Excel sheet with proper headings and footings for payroll of employees. Enter at least 10 records in the sheet. Calculate the total salary of each employee which includes Basic, DA, Medical, TA (Travelling Allowances), and perks. Create a chart and give a proper heading to the chart.

3. Create a PowerPoint presentation of 10 slides of your own choice. The presentation should consist of pictures, animation effects and good color combination of the texts.



Nalanda Open University
Annual Examination - 2023
Bachelor in Computer Application (BCA), Part-II
Paper-IX (OPERATING SYSTEM CONCEPTS)

Time: 3.00 Hrs.

Full Marks: 80

Answer any Five questions. All questions carry equal marks.

किन्हीं पाँच प्रश्नों के उत्तर दीजिए । सभी प्रश्नों के अंक समान हैं ।

1. Define Operating system. Discuss the functions of an Operating System.
2. What is Process Scheduling? Explain any two types of process scheduling algorithms with examples.
3. Explain DMA (Direct Memory Access). How it is useful in bulk data transfer?
4. What are threads? Why are they used? Discuss different types of threads and give their advantages and disadvantages.
5. Explain in details Inter-process communication? What is semaphores?
6. Write at least 10 commands with their complete syntax in UNIX. Also explain the use of each command.
7. Define Process. Explain the Process Life Cycle with the help of a diagram.
8. What do you mean by deadlock? How can we prevent the occurrence of a deadlock?
9. With the help of a diagram explain the structure of Unix Operating System. In details
10. Write Short notes on any **two** of the following:-
 - a. Mobile Operating System
 - b. Multiprogramming
 - c. Process Control Block (PCB)
 - d. Context Switching



EXAMINATION PROGRAMME-2023
BCA, Part-II

Date	Papers	Time	Examination Centre
17.08.2023	BCA, Paper-IX	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
19.08.2023	BCA, Paper-X	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
21.08.2023	BCA, Paper-XI	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
23.08.2023	BCA, Paper-XII	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
29.08.2023	BCA, Paper-XIII	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
31.08.2023	BCA, Paper-XIV	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
02.09.2023	BCA, Paper-XV	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
04.09.2023	BCA, Paper-XVI	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
05.09.2023	BCA, Paper-IX (Practical)	11.30 AM to 1.30 PM	School of Computer Education & IT, 12th Floor, Biscomaun Tower, Patna-800001
07.09.2023	BCA, Paper-X (Practical)	11.30 AM to 1.30 PM	
08.09.2023	BCA, Paper-XI (Practical)	11.30 AM to 1.30 PM	
09.09.2023	BCA, Paper-XII (Practical)	11.30 AM to 1.30 PM	
11.09.2023	BCA, Paper-XIII (Practical)	11.30 AM to 1.30 PM	
12.09.2023	BCA, Paper-XIV (Practical)	11.30 AM to 1.30 PM	
13.09.2023	BCA, Paper-XVI (Practical)	11.30 AM to 1.30 PM	

Nalanda Open University
Annual Examination - 2023
Bachelor in Computer Application (BCA), Part-II
Paper-X (Computer Networking)

Time: 3.00 Hrs.

Full Marks: 80

Answer any Five questions. All questions carry equal marks.
 किन्हीं पाँच प्रश्नों के उत्तर दीजिए । सभी प्रश्नों के अंक समान हैं ।

1. What is networking? Explain LAN MAN and WAN with examples.
2. Explain physical layer, Data Link Layer and Network Layer of OSI reference model of networking in detail.
3. Discuss various transmission media and their uses with examples
4. Explain various topologies with their advantages and disadvantages.
5. What is modulation? Discuss various types of modulations with examples.
6. Define multiplexing. Explain different types of multiplexing with examples.
7. Define network congestion. How congestion is handled on network for smooth traffic on network? Explain.
8. Explain the role of session layer and presentation layer of OSI model with the help of an example.
9. Describe various protocols at transport layer and Application layer of TCP/IP model.
10. Write Short notes on:
 - (a) Transmission impairment
 - (b) TCP/IP model
 - (c) Error detection and correction.
 - (d) Transmission mode.



EXAMINATION PROGRAMME-2023
BCA, Part-II

Date	Papers	Time	Examination Centre
17.08.2023	BCA, Paper-IX	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
19.08.2023	BCA, Paper-X	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
21.08.2023	BCA, Paper-XI	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
23.08.2023	BCA, Paper-XII	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
29.08.2023	BCA, Paper-XIII	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
31.08.2023	BCA, Paper-XIV	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
02.09.2023	BCA, Paper-XV	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
04.09.2023	BCA, Paper-XVI	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
05.09.2023	BCA, Paper-IX (Practical)	11.30 AM to 1.30 PM	School of Computer Education & IT, 12th Floor, Biscomaun Tower, Patna-800001
07.09.2023	BCA, Paper-X (Practical)	11.30 AM to 1.30 PM	
08.09.2023	BCA, Paper-XI (Practical)	11.30 AM to 1.30 PM	
09.09.2023	BCA, Paper-XII (Practical)	11.30 AM to 1.30 PM	
11.09.2023	BCA, Paper-XIII (Practical)	11.30 AM to 1.30 PM	
12.09.2023	BCA, Paper-XIV (Practical)	11.30 AM to 1.30 PM	
13.09.2023	BCA, Paper-XVI (Practical)	11.30 AM to 1.30 PM	

Nalanda Open University
Annual Examination - 2023
Bachelor in Computer Application (BCA), Part-II
Paper-XI (DBMS using ACCESS)

Time: 3.00 Hrs.

Full Marks: 80

Answer any five questions. All questions carry equal marks.

1. Discuss elements of DBMS in detail. What are the advantages and disadvantages of using DBMS?
2. How data is arranged and accessed in DBMS? Explain.
3. Explain various models of DBMS with the help of an examples.
4. Describe different types of attribute in an E-R diagram. Draw an E-R diagram for School management system.
5. Define Normalization. Explain how and when a table is normalized. Give examples.
6. Differentiate between third normal form and Boyce Codd normal form with the help of an example.
7. Define security. How it is different from DBMS Integrity and Threat? What are different types of security threats?
8. Discuss various types of datatypes used in MS-Access.
9. What is defense Mechanism? Discuss different levels of defense recognized for database Security.
10. Write short notes on any **two**:
 - (a) Architecture DBMS
 - (b) SQL
 - (c) Auditing and control.
 - (d) Objects of MS-Access



EXAMINATION PROGRAMME-2023
BCA, Part-II

Date	Papers	Time	Examination Centre
17.08.2023	BCA, Paper-IX	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
19.08.2023	BCA, Paper-X	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
21.08.2023	BCA, Paper-XI	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
23.08.2023	BCA, Paper-XII	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
29.08.2023	BCA, Paper-XIII	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
31.08.2023	BCA, Paper-XIV	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
02.09.2023	BCA, Paper-XV	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
04.09.2023	BCA, Paper-XVI	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
05.09.2023	BCA, Paper-IX (Practical)	11.30 AM to 1.30 PM	School of Computer Education & IT, 12th Floor, Biscomaun Tower, Patna-800001
07.09.2023	BCA, Paper-X (Practical)	11.30 AM to 1.30 PM	
08.09.2023	BCA, Paper-XI (Practical)	11.30 AM to 1.30 PM	
09.09.2023	BCA, Paper-XII (Practical)	11.30 AM to 1.30 PM	
11.09.2023	BCA, Paper-XIII (Practical)	11.30 AM to 1.30 PM	
12.09.2023	BCA, Paper-XIV (Practical)	11.30 AM to 1.30 PM	
13.09.2023	BCA, Paper-XVI (Practical)	11.30 AM to 1.30 PM	

Nalanda Open University
Annual Examination - 2023
Bachelor in Computer Application (BCA), Part-II
Paper-XII (MULTIMEDIA AND ANIMATION)

Time: 3.00 Hrs.

Full Marks: 80

Answer any five questions. All questions carry equal marks.

1. Explain at least five applications of Multimedia in detail.
2. Define HTML. Describe Font editing and design tools used in Multimedia.
3. What are the features of multimedia authoring tools? Explain.
4. What is MS-Excel? Explain the features of MS-Excel with examples.
5. What are the things that you should think about when you are shooting and editing your project? Explain.
6. Discuss how computers can be integrated with TVs. What are different recording formats?
7. Why software testing is important? Explain different types of software testing.
8. Discuss at least 10 HTML tags with their descriptions.
9. Discuss about the Adobe multimedia structure. Explain five different tools used in Photoshop.
10. Write short notes on any **two** of the following:
 - (a) Word Processor
 - (b) Principles of Animation
 - (c) Role of sounds and audio in Multimedia
 - (d) Image file formats



EXAMINATION PROGRAMME-2023
BCA, Part-II

Date	Papers	Time	Examination Centre
17.08.2023	BCA, Paper-IX	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
19.08.2023	BCA, Paper-X	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
21.08.2023	BCA, Paper-XI	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
23.08.2023	BCA, Paper-XII	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
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31.08.2023	BCA, Paper-XIV	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
02.09.2023	BCA, Paper-XV	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
04.09.2023	BCA, Paper-XVI	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
05.09.2023	BCA, Paper-IX (Practical)	11.30 AM to 1.30 PM	School of Computer Education & IT, 12th Floor, Biscomaun Tower, Patna-800001
07.09.2023	BCA, Paper-X (Practical)	11.30 AM to 1.30 PM	
08.09.2023	BCA, Paper-XI (Practical)	11.30 AM to 1.30 PM	
09.09.2023	BCA, Paper-XII (Practical)	11.30 AM to 1.30 PM	
11.09.2023	BCA, Paper-XIII (Practical)	11.30 AM to 1.30 PM	
12.09.2023	BCA, Paper-XIV (Practical)	11.30 AM to 1.30 PM	
13.09.2023	BCA, Paper-XVI (Practical)	11.30 AM to 1.30 PM	

Nalanda Open University
Annual Examination - 2023
Bachelor in Computer Application (BCA), Part-II
Paper-XIII (Data Structure Using C)

Time: 3.00 Hrs.

Full Marks: 80

Answer any five questions. All questions carry equal marks.

1. What is an algorithm? Explain its features with the help of suitable examples. Write an algorithm to generate a Fibonacci series.
2. Define data structure. How is a linked list different from arrays? Explain with the help of an example. Write the advantages of a linked list.
3. Describe different types of linked list with examples.
4. Define queue. Explain different types of queues with examples. How is insertion done in queues?
5. Compare and contrast between a stack and a queue. Give examples for both.
6. Explain insertion and deletion operations on a stack with the help of an example.
7. Explain any two sorting techniques with the help of examples.
8. Explain at least two searching techniques with examples.
9. Describe a B-tree with the help of an example. Discuss applications of a B-tree.
10. Write short notes on any two of the following:
 - (a) Recursion
 - (b) Binary Search Tree
 - (c) Algorithm complexities
 - (d) Graph.



EXAMINATION PROGRAMME-2023
BCA, Part-II

Date	Papers	Time	Examination Centre
17.08.2023	BCA, Paper-IX	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Bismaun Bhawan, Patna
19.08.2023	BCA, Paper-X	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Bismaun Bhawan, Patna
21.08.2023	BCA, Paper-XI	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Bismaun Bhawan, Patna
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29.08.2023	BCA, Paper-XIII	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Bismaun Bhawan, Patna
31.08.2023	BCA, Paper-XIV	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Bismaun Bhawan, Patna
02.09.2023	BCA, Paper-XV	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Bismaun Bhawan, Patna
04.09.2023	BCA, Paper-XVI	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Bismaun Bhawan, Patna
05.09.2023	BCA, Paper-IX (Practical)	11.30 AM to 1.30 PM	School of Computer Education & IT, 12th Floor, Bismaun Tower, Patna-800001
07.09.2023	BCA, Paper-X (Practical)	11.30 AM to 1.30 PM	
08.09.2023	BCA, Paper-XI (Practical)	11.30 AM to 1.30 PM	
09.09.2023	BCA, Paper-XII (Practical)	11.30 AM to 1.30 PM	
11.09.2023	BCA, Paper-XIII (Practical)	11.30 AM to 1.30 PM	
12.09.2023	BCA, Paper-XIV (Practical)	11.30 AM to 1.30 PM	
13.09.2023	BCA, Paper-XVI (Practical)	11.30 AM to 1.30 PM	

Nalanda Open University
Annual Examination - 2023
Bachelor in Computer Application (BCA), Part-II
Paper- XIV: Objected Oriented Programming Using C++

Time: 3.00 Hrs.

Full Marks: 80

*Answer any **five** questions. All questions carry equal marks.*

1. Explain any six features of Object Oriented Programming.
2. What are constructors? Discuss various types of constructors. Write a program in C++ to implement constructors.
3. Explain various types of operators in C++. Give examples for each.
4. What are conditional statements? Explain different types of conditional statements used in C++ with examples.
5. Describe storage class in C++. Explain inline function with the help of an example.
6. Write a program in C++ to implement Call by Value and Call by Reference?
7. What is the difference between struct and class? Differentiate between function overloading and operator overloading. Give examples.
8. Differentiate between virtual, static and friend function with the help of an example.
9. Explain various types of inheritance in C++ with the help of examples.
10. Write short notes on any **two**:
 - (a) Data conversion
 - (b) Looping Statement in C++.
 - (c) Pointers
 - (d) Exception handling.

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NALANDA OPEN UNIVERSITY
Bachelor in Computer Application (BCA), Part-II
PAPER–XV

(Statistical Methods and Linear Programming)
Annual Examination, 2023

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.
Standard calculator is allowed.

1. What is statistics ? Discuss its nature, scope and limitations.
2. Draw a Histogram and find the Mode with the help of graphical method from the following data :

<i>CI</i>	0 - 5	5 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40
<i>Frequency</i>	6	11	18	25	29	16	13	5

3. What do you understand by collection of data ? What are the types of data ?
4. Find out the mean from the following data :

<i>x</i>	10	20	30	40	50	60	70	80	90
<i>f</i>	8	10	6	4	10	4	6	2	4

5. Find the median from the following data :

<i>CI</i>	50 - 54	55 - 59	60 - 64	65 - 69	70 - 74	75 - 79	80 - 84	85 - 89
<i>f</i>	1	5	17	36	25	11	4	1

6. Find the first quartile and third quartile from the following data :

<i>CI</i>	1 - 9	10 - 18	19 - 27	28 - 36	37 - 45
<i>f</i>	9	28	45	12	6

7. Define the mean Deviation and find the mean Deviation from median from the following data :

<i>Size</i>	5	6	7	8	9	10	11	12	13
<i>Freq.</i>	4	5	6	7	8	9	10	3	2

8. Explain Range and Quartile Deviation with examples.
9. Explain the classical definition of Probability and its limitations.
10. Calculate Karl Pearson's coefficient of Skewness from the following data :

<i>Marks (morethan)</i>	0	10	20	30	40	50	60	70	80
<i>No of Students</i>	150	140	100	80	80	70	30	14	0



Nalanda Open University
Annual Examination - 2023
Bachelor in Computer Application (BCA), Part-II
Paper- XVI: (Internet and Web Technology)

Time: 3.00 Hrs.

Full Marks: 80

Answer any five questions. All questions are compulsory.

1. Define Internet. Describe various Application area of Internet and how internet is being used in these applications.
2. Define IP Address. Explain IP address class with examples. What is the role of IP Address in Web Technology?
3. Explain TCP/IP model with the help of a diagram. What are the advantages of using TCP/IP?
4. Discuss at least 10 HTML tags with examples.
5. How graphics are added in HTML? Describe different Image attributes.
6. Compare and contrast between Simple Network Management Protocol (SNMP) and File Transfer Protocol (FTP).
7. Explain various types of Type casting in JavaScript with the help of an example.
8. Describe different types of operators used in JavaScript with examples.
9. Differentiate between Servlet and JSP. Explain JSP Application Architecture with diagram.
10. Write short notes on any **two** of the following:
 - (a) Web Servers
 - (b) Hyperlink
 - (c) Various ways of communication over internet
 - (d) Data types in Java



SET-I

Nalanda Open University

Annual Examination - 2023

Bachelor in Computer Application (BCA), Part-II

Paper- IX: OPERATING SYSTEM CONCEPTS (Practical)

Time: 2.00 Hrs.

Full Marks: 20

Answer any two questions. Write all the steps in your copy.

1. Write at least 10 commands in UNIX with their complete syntax.
2. Write a shell script to print a series of first 10 even numbers.
3. Discuss briefly the components of UNIX Operating system.

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SET-II

Nalanda Open University

Annual Examination - 2023

Bachelor in Computer Application (BCA), Part-II

Paper- IX: OPERATING SYSTEM CONCEPTS (Practical)

Time: 2.00 Hrs.

Full Marks: 20

Answer any two questions. Write all the steps in your copy.

1. Write at least 10 commands in UNIX with their complete syntax.
2. Write a shell script to print whether a given number is odd or not.
3. Discuss the UNIX file system.

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SET-I

Nalanda Open University
Annual Examination - 2023
Bachelor in Computer Application (BCA), Part-II
Paper- X: Computer Networking (Practical)

Time: 3.00 Hrs.

Full Marks: 20

Answer any two questions. Write all the steps in your copy.

1. Write at least 10 IP Address of class A, B and C. Also write the subnet mask for each.
2. Discuss various transmission modes with diagram and examples.
3. Explain the functions of physical layer and network layer of OSI model.



SET-II

Nalanda Open University
Annual Examination - 2023
Bachelor in Computer Application (BCA), Part-II
Paper- X: Computer Networking (Practical)

Time: 3.00 Hrs.

Full Marks: 20

Answer any two questions. Write all the steps in your copy.

1. Write at least 10 IP Address of class A, B and C. Also write the subnet mask for each.
2. Define topology. Discuss at least three topologies with their diagram.
3. Explain the functions of Data Link layer and Transport layer of OSI model.



SET-I

Nalanda Open University
Annual Examination - 2023
Bachelor in Computer Application (BCA), Part-II
Paper- XI: DBMS using Access (Practical)

Time: 3.00 Hrs.

Full Marks: 20

Answer any two questions. Write all the steps in your copy.

1. Create Student Table with required attributes and enter at least 10 records in it.
2. Write five queries for Inserting, deleting and modifying the records.
3. Describe 5 application areas of DBMS.



SET-II

Nalanda Open University
Annual Examination - 2023
Bachelor in Computer Application (BCA), Part-II
Paper- XI: DBMS using Access (Practical)

Time: 3.00 Hrs.

Full Marks: 20

Answer any two questions. Write all the steps in your copy.

1. Create teacher Table with required attributes and enter at least 10 records in it.
2. Write five queries for Inserting, deleting and modifying the records.
3. Describe 5 application areas of DBMS.



SET-I

Nalanda Open University
Annual Examination - 2023
Bachelor in Computer Application (BCA), Part-II
Paper- XII: Multimedia and Animation (Practical)

Time: 2.00 Hrs.

Full Marks: 20

Answer any two questions. Write all the steps in your copy.

1. Perform the following tasks using MS-Word document:
 - (a) Write one paragraph and define proper margin, header and footer.
 - (b) Insert a hyperlink into it.
 - (c) Change the color of the fonts and make them bold.
 - (d) Create a mail merge document.
2. Create an HTML document of your own choice.
3. Create a PowerPoint presentation of 10 slides of your own choice. The presentation should consist of pictures, animation effects and good color combination of the texts.

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SET-II

Nalanda Open University
Annual Examination - 2023
Bachelor in Computer Application (BCA), Part-II
Paper- XII: Multimedia and Animation (Practical)

Time: 2.00 Hrs.

Full Marks: 20

Answer any two questions. Write all the steps in your copy.

1. Perform the following tasks using MS-Word document:
 - (a) Write one paragraph define proper margin, header and footer. .
 - (b) Increase the size of the font and underline the statements.
 - (c) Insert a picture in the document.
 - (d) Create a macro using keyboard option.
2. Create an HTML document of your own choice.
3. Create a PowerPoint presentation of 10 slides of your own choice. The presentation should consist of pictures, animation effects and good color combination of the texts.

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SET-I

Nalanda Open University
Annual Examination - 2023
Bachelor in Computer Application (BCA), Part-II
Paper- XIII: Data Structure Using C (Practical)

Time: 3.00 Hrs.

Full Marks: 20

Answer any two questions. Write all the steps in your copy.

1. Write a program in C to implement queue operations.
2. Write a program in C to implement matrix multiplication using arrays.
3. Write a program in C to implement linked list.

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SET-II

Nalanda Open University
Annual Examination - 2023
Bachelor in Computer Application (BCA), Part-II
Paper- XIII: Data Structure Using C (Practical)

Time: 3.00 Hrs.

Full Marks: 20

Answer any two questions. Write all the steps in your copy.

1. Write a program to implement insertion and deletion on linked list
2. Write a program in C to implement push and pop operation on a stack.
3. Write a program in C to implement bubblesort.

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SET-I

Nalanda Open University

Annual Examination - 2023

Bachelor in Computer Application (BCA), Part-II

Paper- XIV: Object Oriented Programming using C++ (Practical)

Time: 3.00 Hrs.

Full Marks: 20

Answer any two questions. Write all the steps in your copy.

1. Write a program in C++ that prints series of 10 even numbers.
2. Write a program in C++ to implement multiple inheritance.
3. Write a program in C++ by using constructors.



SET-II

Nalanda Open University

Annual Examination - 2023

Bachelor in Computer Application (BCA), Part-II

Paper- XIV: Object Oriented Programming using C++ (Practical)

Time: 3.00 Hrs.

Full Marks: 20

Answer any two questions. Write all the steps in your copy.

1. Write a program in C++ that displays the series of 10 odd numbers.
2. Write a program in C++ to implement Polymorphism.
3. Write a program in C++ to implement multilevel inheritance.



SET-I

Nalanda Open University
Annual Examination - 2023
Bachelor in Computer Application (BCA), Part-II
Paper- XVI: Internet and Web Technology (Practical)

Time: 3.00 Hrs.

Full Marks: 20

Answer any two questions. Write all the steps in your copy.

1. Write the code in HTML to display:

"Welcome to Nalanda Open University"

2. Write HTML code to create a table for Student of 5 columns and 3 rows and enter marks for three subjects with their roll nos. and names.
3. Write a JavaScript function to calculate the sum of the first 10 even numbers.



SET-II

Nalanda Open University
Annual Examination - 2023
Bachelor in Computer Application (BCA), Part-II
Paper- XVI: Internet and Web Technology (Practical)

Time: 3.00 Hrs.

Full Marks: 20

Answer any two questions. Write all the steps in your copy.

1. Write the code in HTML to display:
"HELLO FRIENDS. HOW ARE YOU?"

2. Write HTML code to insert a hyperlink.
3. Write a JavaScript program to check whether the number entered from the keyboard is greatest of three numbers.



Nalanda Open University
Annual Examination - 2023
Bachelor in Computer Application (BCA), Part-III
Paper-XVII [Advanced Computer Networking]

Time: 3.00 Hrs.

Full Marks: 80

Answer any Five questions. All questions carry equal marks.

1. Define Networking. What are the benefits of networking? Discuss basic components of networking.
2. What is Internet Service Provider (ISP)? Explain various options for connecting to ISP.
3. Discuss various types of transmission media used for networking with examples.
4. Discuss the importance of HUB, Switch and Router in Networking.
5. Explain the concept of LAN, MAN and WAN with examples.
6. What is the importance of Internet Protocol (IP) and subnet mask in Networking? Explain.
7. What is the need of an Operating System? Describe various types of Operating system.
8. What is a DHCP server? How does it work?
9. Discuss Unicast, Broadcast and Multicast with example.
10. Write Short notes on:
 - a. Firewall
 - b. MAC Address
 - c. Cloud Computing
 - d. FTP Client & Server



EXAMINATION PROGRAMME-2023
BCA, Part-III

Date	Papers	Time	Examination Centre
02.08.2023	BCA, Paper-XVII	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
04.08.2023	BCA, Paper-XVIII	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
07.08.2023	BCA, Paper-XIX	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
09.08.2023	BCA, Paper-XX	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
11.08.2023	BCA, Paper-XXI	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
12.08.2023	BCA, Paper-XXII	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
14.08.2023	BCA, Paper-XXIII	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
16.08.2023	BCA, Paper-XXIV (Project-Viva)	12.00 Noon onwards	School of Computer Education & IT, 12th Floor, Biscomaun Tower, Patna-800001

Nalanda Open University
Annual Examination - 2023
Bachelor in Computer Application (BCA), Part-III
[Paper-XVIII: Software Engineering]

Time: 3.00 Hrs.

Full Marks: 80

Answer any Five questions. All questions carry equal marks.

1. Define software. Discuss different types of software and their applications.
2. What is fact finding techniques? Why and when it is required? Describe any two types of fact finding techniques with examples.
3. Who is a system analyst? Discuss the role and responsibilities of a System Analyst.
4. Explain any three SDLC models with diagrams. Also give advantages and disadvantages of each model.
5. What is SRS? Why it is important? Discuss a SRS for University Management Information System.
6. What is a risk? Discuss any five types of risk associated with software development. How these risks can be resolved? Give Solutions.
7. Why team is required for software development? Describe different types of teams with examples.
8. Define and describe Software Requirement Specification (SRS). What are the characteristics of SRS?
9. Define and describe DFD. Draw a DFD for a system of your own choice. Make necessary assumptions if required.
10. Write short notes on any **two**:
 - (a) COCOMO
 - (b) Software metrics
 - (c) Modularization
 - (d) Project management tools.



EXAMINATION PROGRAMME-2023
BCA, Part-III

Date	Papers	Time	Examination Centre
02.08.2023	BCA, Paper-XVII	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
04.08.2023	BCA, Paper-XVIII	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
07.08.2023	BCA, Paper-XIX	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
09.08.2023	BCA, Paper-XX	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
11.08.2023	BCA, Paper-XXI	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
12.08.2023	BCA, Paper-XXII	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
14.08.2023	BCA, Paper-XXIII	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
16.08.2023	BCA, Paper-XXIV (Project-Viva)	12.00 Noon onwards	School of Computer Education & IT, 12th Floor, Biscomaun Tower, Patna-800001

Nalanda Open University
Annual Examination - 2023
Bachelor in Computer Application (BCA), Part-III
Paper-[XIX: Java Programming]

Time: 3.00 Hrs.

Full Marks: 80

*Answer any **Five** questions. All questions carry equal marks.*

1. Define Java. Why it is called platform independent? Differentiate between Java and C. Give examples of each.
2. Describe at least 10 keywords used in Java with their functions.
3. Explain Abstract methods and classes. Explain wrapper class with the help of an example?
4. Discuss different types of operators in Java with examples.
5. What are decision making statements in Java? Explain with the help of examples.
6. Define constructors in Java. Why are they used? Discuss various types of constructors with examples of each.
7. Write a program to implement multiple inheritance in Java. Compare and contrast between multilevel inheritance and multiple inheritance with examples.
8. What is a thread? What is the difference between multiprocessing and multithreading? What is to be done to implement these in a program?
9. List some of the most common types of exceptions that might occur in Java. Give examples. Explain how exception handling mechanism can be used for debugging a program.
10. Write short notes on any **two**:
 - (a) Applet Life cycle
 - (b) Array
 - (c) Constants and variables in Java
 - (d) Data types in Java.



Programme of B.C.A. Part-III

Annual Practical Examination - 2023

Venue : 12th Floor, Biscomaun Tower School of Computer Science

<i>Date</i>	<i>Time</i>	<i>Paper</i>	<i>Venue</i>
17.08.2023	11.00 AM to 01.00 PM	XVII	12th Floor, Biscomaun Tower School of Computer Science
18.08.2023	11.00 AM to 01.00 PM	XIX	
19.08.2023	11.00 AM to 01.00 PM	XX	
21.08.2023	11.00 AM to 01.00 PM	XXI	

Nalanda Open University
Annual Examination - 2023
Bachelor in Computer Application (BCA), Part-III
Paper- XX: RDBMS

Time: 3.00 Hrs.

Full Marks: 80

*Answer any **Five** questions. All questions carry equal marks.*

1. What are the advantages of Database Management System? Discuss some application areas of DBMS.
2. What are Database anomalies? Explain with the help of an example.
3. Who is responsible for handling and managing data in a Database? Discuss his/her role and responsibilities.
4. Define an E-R diagram. What are its components? Draw an E-R Diagram of a system of your own choice. Explain each component used in the diagram.
5. Describe at least 10 SQL commands with their syntax and use.
6. Describe the various operations of relational algebra with examples.
7. Explain Integrity rule, logical and physical independence rule and the insert and update rule of DBMS.
8. Define Normalization. Explain various types of Normalization with examples.
9. What is a transaction? Discuss the ACID properties of a transaction with help of an example.
10. Write short notes on any two:
 - (a) Types of key in DBMS
 - (b) Database languages
 - (c) DBMS security
 - (d) Types of attributes.



Programme of B.C.A. Part-III
Annual Practical Examination - 2023

Venue : 12th Floor, Biscomaun Tower School of Computer Science

<i>Date</i>	<i>Time</i>	<i>Paper</i>	<i>Venue</i>
17.08.2023	11.00 AM to 01.00 PM	XVII	12th Floor, Biscomaun Tower School of Computer Science
18.08.2023	11.00 AM to 01.00 PM	XIX	
19.08.2023	11.00 AM to 01.00 PM	XX	
21.08.2023	11.00 AM to 01.00 PM	XXI	

Nalanda Open University
Annual Examination - 2023
Bachelor in Computer Application (BCA), Part-III
Paper- XXI: Programming in VB.Net

Time: 3.00 Hrs.

Full Marks: 80

*Answer any **Five** questions. All questions carry equal marks.*

1. Define VB.net. Explain the implementation of class library in vb.net?
2. Explain how inheritance is implemented in Vb.net with the help of an example.
3. What is an event handler? Describe important form events with their functions related to a form.
4. What are the elements of window graphical interface? Discuss the properties of SaveFileDialog Control.
5. What is component? Create your own component in vb.net? Write the steps to simple binding the data through form wizard?
6. Write a program in vb.net to insert, update and delete record into a table?
7. What is a fileStream? List few commonly used *System.IO* namespaces with description.
8. How data manipulation handled in VB.net? Explain with the help of examples.
9. Explain File and Directory classes with examples.
10. Write short notes on any **two**:
 - (a) Role of Delegates in VB.net
 - (b) Dialog box
 - (c) MDI
 - (d) Validation



Revised

Programme of B.C.A. Part-III

Annual Practical Examination – 2023

Venue : 12th Floor, Biscomaun Tower School of Computer Science

<i>Date</i>	<i>Time</i>	<i>Paper</i>	<i>Venue</i>
18.08.2023	11.00 AM to 01.00 PM	XIX	12th Floor, Biscomaun Tower School of Computer Science
19.08.2023	11.00 AM to 01.00 PM	XX	
21.08.2023	11.00 AM to 01.00 PM	XXI	
22.08.2023	11.00 AM to 01.00 PM	XVII	

NALANDA OPEN UNIVERSITY
Bachelor of Computer Application (BCA), Part-III
PAPER-XXII

(Computer Oriented Numerical Technique)
Annual Examination, 2023

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions.
All questions carry equal marks. Calculator is allowed.

- (a) Using the Newton-Raphson method. Find the square root of 13 with initial approximation $x_0 = 3.5$.
(b) Find the least positive root of equation with the $f(x) = x^3 - 4x - 9 = 0$ help of Bisection method.
- Solve the system of equations by Gauss Elimination method :—
 $3x_1 + 2x_2 + x_3 = 3$
 $2x_1 + x_2 + x_3 = 0$
 $6x_1 + 2x_2 + 4x_3 = 6$
- Solve the following system of equations by Gauss Seidel iteration method.
 $2x_1 + x_2 - 3x_3 + 9x_4 = 31$
 $3x_1 - 4x_2 + 10x_3 + x_4 = 29$
 $2x_1 + 12x_2 + x_3 - 4x_4 = 13$
 $13x_1 + 5x_2 - 3x_3 + x_4 = 18$

- (a) Using the Lagrange's Interpolation formula to find the value of y when x = 15.

x	5	6	9	11	14	18
y = f(x)	12	13	16	18	22	24

- (b) Construct Newton's Forward difference table for data and also find f(4) from the following data :—

x	3	5	7	9	11	13
f(x)	6	24	38	108	132	165

- (a) Find the relationship among E, Δ and D.
(b) Find f(13) from the following data :—

x	4	6	8	10	12	14
f(x)	19	40	79	142	167	201

- (a) State and prove Simpson's $\frac{1}{3}$ rd rule.

- (b) Evaluate $\int_0^1 \frac{dx}{1+x^2}$ subdividing the interval (0, 1) into 6 equal parts using Simpson's $\frac{3}{8}$ th rule.

- Using Runge Kutta fourth order method $y' = \frac{y-t}{y+t}$, $y(0) = 1$, find y (0.5) taken h = 0.5.

- Given that :—

x	1.0	1.1	1.2	1.3	1.4	1.5	1.6
y	7.989	8.403	8.781	9.129	9.451	9.750	10.031

Find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ at x = 1.6

- Using Euler's method to find the solution of $y' = x + y$ given $y(0) = 1$. Find the solution on [0, 0.8] with h = 0.2.
- Using Taylor's series method to find the solution of $y' = 2x^3 + y^2$, $y(0) = 0.5$ at y(0.4) taking h = 0.1.

Nalanda Open University
Annual Examination - 2023
Bachelor in Computer Application (BCA), Part-III
Paper- XXIII: Theory of Computation

Time: 3.00 Hrs.

Full Marks: 80

*Answer any **Five** questions. All questions carry equal marks.*

1. Define Deterministic Finite Automata. How it is different from Moore machine? Give examples for each.
2. What is Null-NFA? How Null-NFA can be converted NFA and DFA? Explain with the help of an example.
3. Explain whether the given expressions DFA or NFA. Discuss your answer with diagram.
(a) $(a+b)^* + ab + (a+b)^*$
(b) $1101^* + 00^*10$
(c) $ab^*bc^*cd^*$
(d) $(a^*+b^*)^*abc$
4. Write at least eight Regular expressions and draw their automata.
5. Define Grammar. Explain ambiguity in Context Free Grammars. Give examples.
6. Define Push Down Automata. Give an example of Push Down automata.
7. "Every Regular Language is Context Free but all Context Free Languages are not regular". Explain the statement with examples.
8. What is pumping lemma? Prove that $\{a^n b^n \mid n \geq 0\}$ is not Regular.
9. Define Turing Machine. How it is different from other Automata's? Construct a Turing Machine for the following functions: $f(m, n) : m \times n$ (Multiplication). Write all the steps in detail.
10. Write short notes on any **two** of the following:
 - (i) Ambiguity
 - (ii) Chomsky classification
 - (iii) Decidable problems
 - (iv) Rice theorem.



Revised

Programme of B.C.A. Part-III
Annual Practical Examination - 2023

Venue : 12th Floor, Biscomaun Tower School of Computer Science

<i>Date</i>	<i>Time</i>	<i>Paper</i>	<i>Venue</i>
18.08.2023	11.00 AM to 01.00 PM	XIX	12th Floor, Biscomaun Tower School of Computer Science
19.08.2023	11.00 AM to 01.00 PM	XX	
21.08.2023	11.00 AM to 01.00 PM	XXI	
22.08.2023	11.00 AM to 01.00 PM	XVII	

Nalanda Open University
Annual Examination - 2023
Bachelor in Computer Application (BCA), Part-III
Paper-XVII [ADVANCED COMPUTER NETWORKING]

Set - I

Time: 3.00 Hrs.

Full Marks: 100 (20)

(Answer all the questions)

1. Compare and contrast twisted pair and Co-axial cable.
2. Discuss sub netting of IP address.



Nalanda Open University
Annual Examination - 2023
Bachelor in Computer Application (BCA), Part-III
Paper-XVII [ADVANCED COMPUTER NETWORKING]

Set - II

Time: 3.00 Hrs.

Full Marks: 100 (20)

(Answer all the questions)

1. Compare and contrast between Bus and star topology.
2. Discuss the role of router and switch in networking.



Nalanda Open University
Annual Examination - 2023
Bachelor in Computer Application (BCA), Part-III
Paper- XIX: Java Programming (Practical)

Set - I

Time: 3.00 Hrs.

Full Marks: (20)

(Answer all the questions)

1. Write a program in Java to implement inheritance.

2. Write a program in Java to reverse a string.

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Nalanda Open University
Annual Examination - 2023
Bachelor in Computer Application (BCA), Part-III
XIX: Java Programming (Practical)

Set - II

Time: 3.00 Hrs.

Full Marks: (20)

(Answer all the questions)

1. Write a program in Java to implement polymorphism.

2. Write a program in Java to generate a Fibonacci series.

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Nalanda Open University
Annual Examination - 2023
Bachelor in Computer Application (BCA), Part-III
Paper- XX: RDBMS (Practical)

Set - I

Time: 2.00 Hrs.

Maximum Marks: 20

(Answer all the questions)

1. Write at least 10 SQL commands and explain their meanings.
2. Draw an E-R diagram for room reservation system of a hotel.



Nalanda Open University
Annual Examination - 2023
Bachelor in Computer Application (BCA), Part-III
Paper- XX: RDBMS (Practical)

Set - II

Time: 2.00 Hrs.

Maximum Marks: 20

(Answer all the questions)

1. Write at least 10 SQL commands and explain their meanings.
2. Draw an E-R diagram for School admission System.



Nalanda Open University
Annual Examination - 2023
Bachelor in Computer Application (BCA), Part-III
Paper- XXI: Programming in VB.Net (Practical)

Set - I

Time: 2.00 Hrs.

Maximum Marks: 20

(Answer all the questions)

1. Write the step to create a Window Forms Applications. Discuss its properties.
2. How menu and sub menu items are created in vb.net?



Nalanda Open University
Annual Examination - 2023
Bachelor in Computer Application (BCA), Part-III
Paper- XXI: Programming in VB.Net (Practical)

Set - II

Time: 2.00 Hrs.

Maximum Marks: 20

(Answer all the questions)

1. Define Class Library. Explain the implementation of class library in vb.net?
2. Explain the window graphical interface elements.

