

**Nalanda Open University**  
**Annual Examination - 2022**  
**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 is Communication important in society ?
2. Imagine present day life in this world without a mobile phone.
3. Define communication and highlight its importance.
4. What do you understand by reading techniques ?
5. Discuss the different formal of a report.
6. What are advantages and limitations of written communication ?
7. What are the seven 'C's of practical communication ? Discuss.
8. Write a note on the Socio-Psychological Barriers to communication.



**REVISED EXAMINATION PROGRAMME-2022**  
**BCA, Part-I**

| <b>Date</b> | <b>Papers</b>             | <b>Time</b>          | <b>Examination Centre</b>  |
|-------------|---------------------------|----------------------|--|
| 26.12.2022  | BCA, Paper-I              | 10.30 AM to 1.30 PM  | Nalanda Open University,<br>2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna                                 |
| 29.12.2022  | BCA, Paper-II             | 10.30 AM to 1.30 PM  | Nalanda Open University,<br>2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna                                 |
| 30.12.2022  | BCA, Paper-III            | 10.30 AM to 1.30 PM  | Nalanda Open University,<br>2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna                                 |
| 03.01.2023  | BCA, Paper-IV             | 10.30 AM to 1.30 PM  | Nalanda Open University,<br>2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna                                 |
| 04.01.2023  | BCA, Paper-V              | 10.30 AM to 1.30 PM  | Nalanda Open University,<br>2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna                                 |
| 06.01.2023  | BCA, Paper-VI             | 10.30 AM to 1.30 PM  | Nalanda Open University,<br>2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna                                 |
| 07.01.2023  | BCA, Paper-VII            | 10.30 AM to 1.30 PM  | Nalanda Open University,<br>2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna                                 |
| 09.01.2023  | BCA, Paper-VIII           | 10.30 AM to 1.30 PM  | Nalanda Open University,<br>2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna                                 |
| 10.01.2023  | BCA, Paper-V (Practical)  | <b>from 10.30 AM</b> | <b>School of Computer Education &amp; IT,<br/>12<sup>th</sup> Floor, Biscomaun Tower,<br/>Patna-800001</b> |
| 11.01.2023  | BCA, Paper-VI (Practical) | <b>from 10.30 AM</b> |  |

# Nalanda Open University

## Annual Examination - 2022

### 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) The origin and evolution of early man is a highly-controversial topic of pre-historic era. (True/False)

मावव की उत्पत्ति और उसका क्रमिक विकास प्रागैतिहासिक युग का एक अति-विवादास्पद प्रकरण रहा है। (सही/गलत)

(ii) Galileo G. who invented telescope was a German Scientist. (True/False)

गैलिलियो जी० जिन्होंने दूरबीन का आविष्कार किया एक जर्मन वैज्ञानिक थे। (सही/गलत)

(iii) Anthropology consists of the study of human beings, especially their origin, development, customs and believes. (True/False)

मानवशास्त्र मानव की उत्पत्ति, उसके विकास, प्रथाओं और विश्वासों के अध्ययन का विज्ञान है। (सही/गलत)

(iv) Rousseau was a highly intelligent philosopher of France. (True/False)

रूसो फ्रांस के एक अति बुद्धिमान दार्शनिक थे। (सही/गलत)

(v) Battle of Buxar (1794) was an important stepping stone in the foundation of British Rule in Bengal. (True/False)

बक्सर का युद्ध बंगाल में ब्रिटिश शासन की स्थापना में एक महत्वपूर्ण प्रारंभिक प्रयास था। (सही/गलत)

(vi) The Indian National Congress was founded in the year 1685. (True/False)

भारतीय राष्ट्रीय कांग्रेस की स्थापना वर्ष 1685 में हुई। (सही/गलत)

(vii) Quit India Movement was a mass movement started in 1942 at the call of Vinoba Bhave. (True/False)

वर्ष 1942 का भारत छोड़ो आन्दोलन जो एक जन आन्दोलन था, विनोबा भावे की अगुआई में शुरू हुआ। (सही/गलत)

(viii) NITI (National Institution for Transforming India) Ayog has been an ambitious initiative of the UPA Government of India started in 2010. (True/False)

NITI आयोग UPA सरकार द्वारा वर्ष 2010 में शुरू की गयी एक महत्वाकांक्षी पहल है। (सही/गलत)

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

रिक्त स्थानों की पूर्ति उचित शब्द/पद से करें।

(i) The Ozone layer is situated in ..... region of the atmosphere.

ओजोन परत वायुमंडल के ..... क्षेत्र में अवस्थित है।

(ii) The intensity of earthquake is measured on .....scale.

भूकम्प की तीव्रता को ..... स्केल पर मापा जाता है।

(iii) The three common natural resources are ....., ..... and .....

तीन सामान्य प्राकृतिक संसाधन ....., ..... और ..... हैं।

(iv) The Environmental (Protection) Act was passed by the Indian Parliament in the Year.....

एन्वारमेंटल (प्रोटेक्शन) एक्ट भारत के पार्लियामेंट द्वारा वर्ष ..... में पारित किया गया।

(v) CNG is a ..... fuel which is environmentally more efficient than petrol and diesel.

CNG एक.....इंधन है जो पेट्रोल और डीजल से पर्यावरणीय दृष्टि से अधिक दक्ष है।

(vi) CFC is a chemical which is notorious for its ..... warming potential.

CFC एक रसायन है जो अपने ..... तापन के कारण कुख्यात है।

P.T.O...

- (vii) International Earth Day is celebrated on .....  
अन्तर्राष्ट्रीय पृथ्वी दिवस ..... को मनाया जाता है ।
- (viii) Solar energy is an important example of ..... energy.  
सौर ऊर्जा.....ऊर्जा का एक महत्वपूर्ण उदाहरण है ।
2. Throw light on the importance and future of social science as a subject of study.  
अध्ययन के एक विषय के रूप में समाज विज्ञान की महत्ता और इसके भविष्य पर प्रकाश डालिए ।
  3. Do you agree with the statement by Aristotle that "Man is a social animal" ? Elaborate your view on the statement giving suitable reasons.  
क्या आप अरस्तु द्वारा दिए गये कथन "मनुष्य एक सामाजिक प्राणी है" से सहमत हैं ? इस कथन पर अपने विचार को उचित तर्क के साथ प्रस्तुत कीजिए ।
  4. Discuss the role of Mahatma Gandhi in the Freedom struggle of India.  
भारत के स्वतंत्रता संग्राम में महात्मा गाँधी की भूमिका का वर्णन कीजिए ।
  5. Give a brief description composition and responsibilities of NITI Aayog.  
नीति आयोग के गठन एवं इसकी जिम्मेदारियों का संक्षिप्त विवरण प्रस्तुत कीजिए ।
  6. What do you mean by biodiversity ? Explain the major threats to biodiversity.  
जैवविविधता से आप क्या समझते हैं ? जैवविविधता के प्रमुख खतरों का विवरण प्रस्तुत कीजिए ।
  7. What do you mean by Water Resource ? Enumerate the causes responsible for stress on fresh water resources.  
जल संसाधन से आप क्या समझते हैं ? स्वच्छ जल संसाधनों पर बढ़ते दबाव के लिए जिम्मेवार कारणों की विवेचना कीजिए ।
  8. Describe in brief three major sources of air pollution. How do they effect health of humans and other life forms on the earth ?  
वायु प्रदूषण के तीन प्रमुख कारणों का संक्षेप में विवरण प्रस्तुत कीजिए । ये किस प्रकार मनुष्य और पृथ्वी के अन्य जीवों के स्वास्थ्य पर प्रभाव डालते हैं ?
  9. Describe in brief the causes and impacts of any **Two** of the following natural disasters :-  
निम्नलिखित में से किन्हीं **दो** प्राकृतिक आपदाओं के कारण और इनके प्रभाव का संक्षिप्त विवरण प्रस्तुत कीजिए :-  
    - (i) Flood (बाढ़)
    - (ii) Cyclone (चक्रवात)
    - (iii) Earthquake (भूकम्प)
    - (iv) Landslide (भूस्खलन)
  10. Write short notes on any **Two** of the following:-  
निम्नलिखित में से किन्हीं **दो** पर टिप्पणी लिखिए:-  
    - (a) Quit India Movement, 1942 (भारत छोड़ो आन्दोलन, 1942)
    - (b) Municipal waste (म्युनिसिपल कचरा)
    - (c) National Skill Development Mission (राष्ट्रीय कौशल विकास मिशन)
    - (d) Natural Resource (प्राकृतिक संसाधन)

**Nalanda Open University**  
**Annual Examination - 2022**  
**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. Discuss some networking devices with their uses.
2. What is the role of memory in Computers? Discuss various types of memory used in computers.
3. What is networking? Why it is required? Discuss LAN, MAN and WAN with examples.
4. Distinguish between RAM and ROM. Discuss the functioning of cache memory with the help of an example.
5. Describe the features of a good programming language. How are programming languages selected?
6. Explain OSI reference model of Network. Discuss each layer of OSI model with the help of a diagram.
7. Compare and contrast between Structured programming and Object-Oriented Programming. Give examples of each.
8. Differentiate between transmission mode and transmission media. Discuss some transmission modes.
9. Differentiate between guided and unguided transmission media. Describe twisted pair and coaxial cables.
10. Write short notes on any two of the following:
  - a. Multitasking
  - b. Router
  - c. Input devices
  - d. Gateway



**NALANDA OPEN UNIVERSITY**  
**Bachelor of Computer Application (BCA), Part-I**  
**PAPER-IV (Mathematics)**

*Annual Examination, 2022*

**Time : 3 Hours.**

**Full Marks : 80**

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

1. (a) If  $A = \{5, 6, 7, 8\}$  and  $B = \{a, b, c\}$ , then find (i)  $A \times B$  (ii)  $B \times A$   
 (b) If  $u = \{1, 2, 3, \dots, 10\}$ ,  $A = \{1, 2, 3, 4\}$ ,  $B = \{1, 2, 3\}$ ,  $C = \{5, 6, 7\}$ ,  $D = \{5, 7, 8, 9\}$ , then find (i)  $A \cup B$ , (ii)  $A'$ , (iii)  $A - B$ , (iv)  $C - D$ .
2. (a) Evaluate  $\begin{vmatrix} a & b & c \\ a^2 & b^2 & c^2 \\ a^3 & b^3 & c^3 \end{vmatrix}$ .  
 (b) If  $f(x) = x^2 - 5x + 7$  and  $A = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$  find  $f(A)$ .
3. (a) How many terms of the progression 15, 12, 9, ..... should be taken so that their sum is 36? Interpret the double answer.  
 (b) Find 5 geometric means between 16 and  $\frac{1}{4}$ .
4. (a) Find the square root of  $-7 - 24i$ .  
 (b) Show that  $(1 + w)(1 + w^2)(1 + w^4)(1 + w^8) = 1$ .
5. Solve the equation by Ferraris method  $x^4 - 3x^2 - 42x - 40 = 0$ .
6. (a) Find the differential coefficient of  $\cos x$  with respect to  $x$  with the help of first principle.  
 (b) Find the Limits  $\lim_{x \rightarrow 4} \frac{x^3 - 2x^2 - 9x + 4}{x^2 - 2x - 8}$ .
7. Find  $\frac{dy}{dx}$  :—  
 (a)  $y = x^4 + 4x^2 - 5 \log x + 6e^{5x}$  (b)  $y = \frac{x \tan x}{\sec x + \tan x}$  (c)  
 $y = \sqrt{\sin \sqrt{x}}$
8. Integrate the following with respect to  $x$   
 (a)  $\int \frac{(1+x)^3}{\sqrt{x}}$  (b)  $\int \frac{e^{2x} - e^{4x}}{e^x - e^{-x}} dx$  (c)  $\int \frac{\sin \sqrt{x}}{\sqrt{x}} dx$
9. Prove that the points A (-3, 1), B (0, 2), C (3, 3) and D (6, 4) are collinear.
10. Find the centricity of an ellipse if its lattice rectum is equal to the one half its major axis.



**REVISED EXAMINATION PROGRAMME-2022**  
**BCA, Part-I**

| Date              | Papers                           | Time                | Examination Centre   |
|-------------------|----------------------------------|---------------------|--|
| 04.01.2023        | BCA, Paper-V                     | 10.30 AM to 1.30 PM | Nalanda Open University,<br>2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna   |
| 06.01.2023        | BCA, Paper-VI                    | 10.30 AM to 1.30 PM | Nalanda Open University,<br>2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna   |
| 07.01.2023        | BCA, Paper-VII                   | 10.30 AM to 1.30 PM | Nalanda Open University,<br>2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna   |
| 09.01.2023        | BCA, Paper-VIII                  | 10.30 AM to 1.30 PM | Nalanda Open University,<br>2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna   |
| 10.01.2023        | BCA, Paper-V (Practical)         | from 10.30 AM       | <b>School of Computer Education &amp; IT,</b><br><b>12<sup>th</sup> Floor, Biscomaun Tower,</b><br><b>Patna-800001</b> |
| <b>14.01.2023</b> | <b>BCA, Paper-VI (Practical)</b> | from 10.30 AM       |  |

**Nalanda Open University**  
**Annual Examination - 2022**  
**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. Define flowchart. Describe the components of flowchart. Draw a flowchart to check whether the given year is leap year or not.
2. Why C is called a High Level Language? Give a structure of a C program. Why header files important in C.
3. Describe at least 10 keywords in C with their uses. Give examples for each.
4. What is the concept of constant and variable in C? Write a program in C using constants and variables and elaborate each step of the program.
5. What is looping in C? Explain different types of looping statements with the help of examples.
6. Define and describe various types of storage class used in C with the help of an example.
7. Differentiate between Structure and Union in C? Give examples for each with the help of programs.
8. Explain logical and relational operators in C with the help of programs.
9. Write a program in C to print the sum of the squares of first 100 even numbers. Elaborate each step of the program. How the same program can be written using functions? Explain.
10. Write short notes on any two:
  - (a) Algorithm
  - (b) Functions
  - (c) Data types in C.
  - (d) Arrays.

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**REVISED EXAMINATION PROGRAMME-2022**  
**BCA, Part-I**

| Date              | Papers                           | Time                | Examination Centre   |
|-------------------|----------------------------------|---------------------|--|
| 04.01.2023        | BCA, Paper-V                     | 10.30 AM to 1.30 PM | Nalanda Open University,<br>2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna   |
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| <b>14.01.2023</b> | <b>BCA, Paper-VI (Practical)</b> | from 10.30 AM       |  |

**Nalanda Open University**  
**Annual Examination - 2022**  
**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. Define and describe My Computer. What are the components of My Computer? Explain.
2. What is a desktop? Describe the components of desktop. How icons can be arranged on the desktop?
3. Explain different view that are present in MS-Word. What is text editing?
4. What is MS-Word? Describe the components of MS-Word with their uses.
5. Explain Spell Check in MS-Word with the help of an example. What are the tools used for eliminating spelling and grammar errors.
6. Explain different types of graphs in MS-Excel using sample data.
7. Define and describe Pivot table with the help of an example. Use sample data if necessary.
8. What is the role played by multimedia in presentation? Give the steps involved in adding animation.
9. What is PowerPoint? Describe the components and applications of Power-Point.
10. Write short notes on any **two**:
  - (a) MS-Paint
  - (b) Notepad
  - (c) Page layout in MS-Word.
  - (d) Mailmerge



**REVISED EXAMINATION PROGRAMME-2022**  
**BCA, Part-I**

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| <b>14.01.2023</b> | <b>BCA, Paper-VI (Practical)</b> | from 10.30 AM       |  |

**Nalanda Open University**  
**Annual Examination - 2022**  
**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)  $(1111001)_2$  to its  $( )_{10}$ .  
 (ii)  $(677)_8$  to Hexadecimal number.  
 (iii)  $(22343)_{10}$  to its Binary equivalent.  
 (iv)  $(FFAB9)_{16}$  to Octal number
2. Simplify the following Boolean function using Sum-of-Product form, by Karnaugh's map:  
 $F(A, B, C, D) = \Sigma(2, 4, 5, 6, 7, 8, 9, 11, 14)$ . Also draw the circuit diagram for it.
3. Define and draw fundamental gates along with their truth tables. How XOR gate is different from OR gate? Explain.
4. Draw a circuit diagram for the following expressions:  
 (i)  $\sim(BC) + C\sim D + A\sim CD$   
 (ii)  $\sim(A + \sim C) + AB + \sim(C\sim D)$   
 (iii)  $\sim(AB + \sim(AC))$   
 (iv)  $(\sim A\sim D) \cdot BC + \sim(A + C + \sim D)$
5. Differentiate between a multiplexer and decoder. Draw their circuit diagrams.
6. Describe JK flip-flop and T flip-flop with their circuit diagram.
7. Discuss memory hierarchy in computers. What is the role of cache, RAM and ROM in computers?
8. What is an Interrupt? Discuss various types of Interrupts with examples.
9. Define ALU. Why it is used? Describe ALU organization with diagram.
10. Write short notes on any **two** of the following:  
 a. Registers                      b. CPU  
 c. RS-flip-flop                    d. Counters.



**REVISED EXAMINATION PROGRAMME-2022**  
**BCA, Part-I**

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| <b>14.01.2023</b> | <b>BCA, Paper-VI (Practical)</b> | from 10.30 AM       |  |



**Nalanda Open University**  
**Annual Examination - 2022**  
**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. Who is a System Analyst? Explain the qualities of System Analyst.
2. Define Data Flow Diagram (DFD)? What are the components of a DFD? Draw a DFD for a "Library Information System".
3. Discuss the Design phase of SDLC. What are the tools used for System design?
4. Define and describe Cost-Benefit Analysis in context of Software development. Why it is required? Explain.
5. What is Feasibility study? Why it is required? Describe different types of feasibility study done during system development.
6. Define SRS and explain the structure of a typical SRS document.
7. Explain the complete process of Implementation of a software in an organization. What types of testing would you suggest before implementation and why?
8. Define Data Dictionary. Discuss the rules for naming tables and fields.
9. Define ER diagram? What are the components of ER diagram? Draw an ER diagram for "School Management system".
10. Write short notes on any **two** of the following:
  - a. Fact Finding Techniques
  - b. SDLC
  - c. CASE tools
  - d. Decision Table.



**REVISED EXAMINATION PROGRAMME-2022**  
**BCA, Part-I**

| Date              | Papers                           | Time                | Examination Centre   |
|-------------------|----------------------------------|---------------------|--|
| 04.01.2023        | BCA, Paper-V                     | 10.30 AM to 1.30 PM | Nalanda Open University,<br>2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna   |
| 06.01.2023        | BCA, Paper-VI                    | 10.30 AM to 1.30 PM | Nalanda Open University,<br>2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna   |
| 07.01.2023        | BCA, Paper-VII                   | 10.30 AM to 1.30 PM | Nalanda Open University,<br>2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna   |
| 09.01.2023        | BCA, Paper-VIII                  | 10.30 AM to 1.30 PM | Nalanda Open University,<br>2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna   |
| 10.01.2023        | BCA, Paper-V (Practical)         | from 10.30 AM       | <b>School of Computer Education &amp; IT,</b><br><b>12<sup>th</sup> Floor, Biscomaun Tower,</b><br><b>Patna-800001</b> |
| <b>14.01.2023</b> | <b>BCA, Paper-VI (Practical)</b> | from 10.30 AM       |  |

**Nalanda Open University**  
**Annual Examination - 2022**  
**Bachelor in Computer Application (BCA), Part-I**  
**Paper-V, Programming Methodology using C (Computer Practical)**

**Set-I**

**Time: 2.00 Hrs.**

**Full Marks: 20**

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

1. Write a program in C language to display whether the number entered from the keyboard is a prime number.
  
2. Write a program to generate the following pattern below:  
22222  
44444  
66666  
88888
  
3. Write a program in C language to compute the average of three numbers.

❧❧❧

**Nalanda Open University**  
**Annual Examination - 2022**  
**Bachelor in Computer Application (BCA), Part-I**  
**Paper-V, Programming Methodology using C (Computer Practical)**

**Set-II**

**Time: 2.00 Hrs.**

**Full Marks: 20**

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

1. Write a program in C language to print whether the given year is a leap year or not.
  
2. Write a program to generate the following pattern below:  
88888  
66666  
44444  
22222
  
3. Write a program in C language to print the sum of the squares of 10 even numbers.

❧❧❧

# Nalanda Open University

**Set-I**

## Annual Examination - 2022

### 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 having two paragraphs on "BCA Course".
  - (b) Give proper heading to the document and footing.
  - (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  $\geq 80$  then Grade "A"
    - (ii) if percentage  $\geq 70$  then Grade "B"
    - (iii) if percentage  $\geq 60$  then Grade "C"
    - (iv) if percentage  $\geq 50$  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 - 2022

### 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 one paragraph about the advantages of BCA program you are doing and define proper margin, header and footer.
  - (b) Insert a hyperlink in the document
  - (c) Divide the document into 3 columns.
  - (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 - 2022**  
**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. Discuss different types of Operating System. Explain the services provided by an Operating System.
2. What are the differences between DOS and UNIX Operating System? What are FAT and NTFS file system?
3. Explain DMA (Direct Memory Access). How it is useful in bulk data transfer?
4. What is Process Control Block (PCB)? What type of information is kept in a PCB? Explain.
5. What is a process? Explain the different states of a process.
6. Write the use of following LINUX commands and their complete syntax, with an example for each:—  
 (a) cat (b) kill (c) grep (d) pwd (e) chmod
7. What is Disk Management? Explain disk formatting and Boot block in context of disk management.
8. Explain Hierarchical File Structure in UNIX. Distinguish between a foreground and a background process in UNIX.
9. Why Memory management is important? Differentiate between internal fragmentation and external fragmentation.
10. Write Short notes on:
  - a. Virtual machine
  - b. Vi Editor
  - c. Mobile Operating System
  - d. Semaphore



**EXAMINATION PROGRAMME-2022**  
**BCA, Part-II**

| Date       | Papers                      | Time                | Examination Centre   |
|------------|-----------------------------|---------------------|--|
| 13.01.2023 | BCA, Paper-IX               | 2.30 PM to 5.30 PM  | Nalanda Open University, 2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna                                    |
| 14.01.2023 | BCA, Paper-X                | 2.30 PM to 5.30 PM  | Nalanda Open University, 2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna                                    |
| 16.01.2023 | BCA, Paper-XI               | 2.30 PM to 5.30 PM  | Nalanda Open University, 2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna                                    |
| 17.01.2023 | BCA, Paper-XII              | 2.30 PM to 5.30 PM  | Nalanda Open University, 2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna                                    |
| 19.01.2023 | BCA, Paper-XIII             | 2.30 PM to 5.30 PM  | Nalanda Open University, 2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna                                    |
| 21.01.2023 | BCA, Paper-XIV              | 2.30 PM to 5.30 PM  | Nalanda Open University, 2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna                                    |
| 24.01.2023 | BCA, Paper-XV               | 2.30 PM to 5.30 PM  | Nalanda Open University, 2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna                                    |
| 25.01.2023 | BCA, Paper-XVI              | 2.30 PM to 5.30 PM  | Nalanda Open University, 2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna                                    |
| 27.01.2023 | BCA, Paper-IX (Practical)   | 11.30 AM to 1.30 PM | <b>School of Computer Education &amp; IT,<br/>12<sup>th</sup> Floor, Biscomaun Tower,<br/>Patna-800001</b> |
| 28.01.2023 | BCA, Paper-X (Practical)    | 11.30 AM to 1.30 PM |  |
| 30.01.2023 | BCA, Paper-XI (Practical)   | 11.30 AM to 1.30 PM |  |
| 31.01.2023 | BCA, Paper-XII (Practical)  | 11.30 AM to 1.30 PM |  |
| 01.02.2023 | BCA, Paper-XIII (Practical) | 11.30 AM to 1.30 PM |  |
| 02.02.2023 | BCA, Paper-XIV (Practical)  | 11.30 AM to 1.30 PM |  |
| 03.02.2023 | BCA, Paper-XVI (Practical)  | 11.30 AM to 1.30 PM |  |

**Nalanda Open University**  
**Annual Examination - 2022**  
**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. Explain TCP/IP model of networking. How is it different from OSI model?
2. Describe various transmission media. Give their advantages and disadvantages
3. What is transmission mode? Explain different types of transmission modes with examples of each.
4. Discuss the functions of Physical layer, Data Link layer and Transport Layer of OSI model.
5. Define and describe different types of network devices and their uses.
6. Why do you need encoding of data before sending it over a medium? Explain any two of the encoding techniques with examples.
7. What is ALOHA? Differentiate between pure ALOHA and slotted ALOHA.
8. Discuss various switching techniques with the help of an example.
9. Define Routing. Explain Flooding and Shortest Path Routing Algorithm. What are the advantages and disadvantages of these algorithms?
10. Write Short notes on:
  - a. CSMA protocol
  - b. Application layer protocols
  - c. Subnet
  - d. Topologies.



**EXAMINATION PROGRAMME-2022**  
**BCA, Part-II**

| Date       | Papers                      | Time                | Examination Centre   |
|------------|-----------------------------|---------------------|--|
| 13.01.2023 | BCA, Paper-IX               | 2.30 PM to 5.30 PM  | Nalanda Open University, 2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna  |
| 14.01.2023 | BCA, Paper-X                | 2.30 PM to 5.30 PM  | Nalanda Open University, 2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna  |
| 16.01.2023 | BCA, Paper-XI               | 2.30 PM to 5.30 PM  | Nalanda Open University, 2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna  |
| 17.01.2023 | BCA, Paper-XII              | 2.30 PM to 5.30 PM  | Nalanda Open University, 2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna  |
| 19.01.2023 | BCA, Paper-XIII             | 2.30 PM to 5.30 PM  | Nalanda Open University, 2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna  |
| 21.01.2023 | BCA, Paper-XIV              | 2.30 PM to 5.30 PM  | Nalanda Open University, 2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna  |
| 24.01.2023 | BCA, Paper-XV               | 2.30 PM to 5.30 PM  | Nalanda Open University, 2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna  |
| 25.01.2023 | BCA, Paper-XVI              | 2.30 PM to 5.30 PM  | Nalanda Open University, 2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna  |
| 27.01.2023 | BCA, Paper-IX (Practical)   | 11.30 AM to 1.30 PM | <b>School of Computer Education &amp; IT,</b><br><b>12<sup>th</sup> Floor, Biscomaun Tower,</b><br><b>Patna-800001</b> |
| 28.01.2023 | BCA, Paper-X (Practical)    | 11.30 AM to 1.30 PM |  |
| 30.01.2023 | BCA, Paper-XI (Practical)   | 11.30 AM to 1.30 PM |  |
| 31.01.2023 | BCA, Paper-XII (Practical)  | 11.30 AM to 1.30 PM |  |
| 01.02.2023 | BCA, Paper-XIII (Practical) | 11.30 AM to 1.30 PM |  |
| 02.02.2023 | BCA, Paper-XIV (Practical)  | 11.30 AM to 1.30 PM |  |
| 03.02.2023 | BCA, Paper-XVI (Practical)  | 11.30 AM to 1.30 PM |  |

**Nalanda Open University**  
**Annual Examination - 2022**  
**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. What are the advantages of using DBMS over traditional file system? Explain Record, Field, Form and queries in context of DMBS.
2. What are the objectives of three level architecture of a DBMS? Explain.
3. Explain different types of relational algebra used in DBMS with help of examples.
4. Who is a Data Base Administrator (DBA)? Describe the role of a DBA.
5. What is Normalization? Differentiate between different normal forms with the help of examples.
6. Describe the datatypes used in MS-Access with examples of each type.
7. Explain some of the objects of MS-Access. What is data control?
8. How expressions are described in MS-Access? Explain.
9. Draw an E-R diagram for “University Admission system” and explain how entities are related to each other.
10. Write short notes on any **two**:
  - (a) Indexing in DBMS
  - (b) Types of keys in DBMS
  - (c) Relational model
  - (d) Advantages of DBMS.

**Nalanda Open University**  
**Annual Examination - 2022**  
**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. Define Office suites. What is a Word Processor? Discuss some Word Processing tools and their uses.
2. Explain the concept of digital movies. How multimedia elements can dynamically be linked with other applications?
3. Define Notation Interchange File Format (NIFF). Discuss the main features of NIFF. Also give advantages of NIFF.
4. Discuss the difference between MIDI video and digital video.
5. What is video compression? Describe simple methods of compressions. Discuss different types of compressions.
6. Describe the various types of image file formats available in multimedia.
7. Explain the twelve basic principles of animation.
8. What is Project planning? Discuss Sliding Window planning in detail.
9. What are the main attributes of designing a World Wide Web? How animation works on web? Explain.
10. Write short notes on any **two** of the following:
  - (a) Authoring tools
  - (b) Software testing
  - (c) CD-ROM Technology
  - (d) HTML.

**Nalanda Open University**  
**Annual Examination - 2022**  
**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. Define algorithm. Explain the approaches for designing an algorithm. Write an algorithm to check whether the number is odd or even.
2. Why space complexity is more critical than time complexity? Discuss the best case, worst case and average case of algorithms with the help of an example.
3. Differentiate between graphs and trees with examples. What are the different types of operations applied on data structures.
4. Write the difference between linked list and queue. Write a program in C to insert an element in a linked list.
5. What is a stack? Explain the terms infix, prefix and postfix expressions with the help of an example. How these expressions are solved using stack?
6. Define Arrays. Explain different types of arrays with examples. Write a program to compute the sum of 10 even numbers using an array.
7. Explain two sorting techniques with examples.
8. Define AVL trees. Describe the operations on AVL tree with an example. What are the applications of AVL trees?
9. Define Binary Search Tree (BST). Explain the major features of a BST. Give an example of BST.
10. Write short notes on any **two**:
  - (a) Searching Techniques
  - (b) Applications of Data structure
  - (c) Strings
  - (d) Categories of algorithms.





**Nalanda Open University**  
**Annual Examination - 2022**  
**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. Define OOPs. Describe the characteristics of OOPs. Write down some advantages of OOPs.
2. What are different data types used in C++? Explain with the help of examples.
3. Define Structure. Declare a structure for a student having roll no, name, address and marks in five subjects. Differentiate between class and structure.
4. Discuss various looping statements in C++ with examples.
5. Explain briefly at least three methods of Object Oriented design
6. Why inheritance in classes required? What is the difference between multilevel inheritance and multiple inheritance? Write a program in C++ using multiple inheritance.
7. Explain enumerated data types with examples. What is a function? Write a program in C++ using functions.
8. Define Polymorphism. Differentiate between function overloading and function overriding with the help of an example.
9. Define Pointers. Differentiate between pointers and arrays. Give suitable examples for each.
10. Write short notes on any **two**:
  - a. Object slicing
  - b. Conditional statements in C++
  - c. Template
  - d. Constructors.

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

(Statistical Methods and Linear Programming)  
*Annual Examination, 2022*

**Time : 3 Hours.**

**Full Marks : 80**

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

1. Define statistics and write its characteristics.
2. What is frequency distribution of continuous series ?
3. Draw Cumulative Frequency Curve (Less and More than) from the following data.  
(Not on graph paper)

|                  |        |         |         |         |         |         |         |
|------------------|--------|---------|---------|---------|---------|---------|---------|
| <i>CI</i>        | 0 - 10 | 10 - 20 | 20 - 30 | 30 - 40 | 40 - 50 | 50 - 60 | 60 - 70 |
| <i>Frequency</i> | 8      | 12      | 18      | 14      | 10      | 6       | 2       |

4. Find the median from the following data.

|           |         |         |         |         |         |         |         |
|-----------|---------|---------|---------|---------|---------|---------|---------|
| <i>CI</i> | 10 - 14 | 15 - 19 | 20 - 24 | 25 - 29 | 30 - 34 | 35 - 39 | 40 - 44 |
| <i>f</i>  | 2       | 1       | 7       | 10      | 5       | 3       | 2       |

5. Find the mode from the following data.

|        |         |         |         |         |         |         |         |
|--------|---------|---------|---------|---------|---------|---------|---------|
| Age    | 70 - 80 | 60 - 70 | 50 - 60 | 40 - 50 | 30 - 40 | 20 - 30 | 10 - 20 |
| Income | 22      | 40      | 31      | 20      | 11      | 6       | 5       |

6. Calculate Quartiles, Quartile Deviation and Coefficient of Quartile deviation from the following data.

|          |    |    |    |    |    |    |    |    |
|----------|----|----|----|----|----|----|----|----|
| <i>x</i> | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 |
| <i>f</i> | 3  | 2  | 7  | 5  | 8  | 6  | 4  | 2  |

7. Discuss the relative merits of range, mean deviations and standard deviations as measure of dispersion.
8. Calculate the Standard Deviation and its Coefficient from the following data.

|          |   |   |   |    |    |    |    |
|----------|---|---|---|----|----|----|----|
| <i>x</i> | 4 | 6 | 8 | 10 | 12 | 14 | 16 |
| <i>f</i> | 1 | 2 | 3 | 5  | 3  | 2  | 1  |

9. What is Skewness ? Give various formula for the calculation of coefficient of skewness.
10. Define statistical probability and state its limitation.



**Nalanda Open University**  
**Annual Examination - 2022**  
**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? What is the need of Internet? Discuss the concept of IP addressing in detail.
2. What is Internet domain? Explain with the help of an example. Discuss Internet Server Identities.
3. Define HTML. Discuss at least 10 HTML tags with examples.
4. Explain Client IP address. What are the two principle functions served by IP address?
5. How do we create frames? What are its disadvantages? Show with an example the use of different heading types.
6. Describe different types of data types used in Java with examples of each.
7. Explain the control statement in Java with examples. What are Arrays?
8. Define XHTML. How it is different from XML? Explain XML Usage and XML syntax in detail.
9. Explain any 5 syntax of JSP (Java Server Pages) action. Illustrate with example.
10. Write short notes on any two:
  - (a) VSAT
  - (b) ISDN
  - (c) WWW
  - (d) FTP and SNMP



**EXAMINATION PROGRAMME-2022**  
**BCA, Part-II**

| Date       | Papers                      | Time                | Examination Centre   |
|------------|-----------------------------|---------------------|--|
| 13.01.2023 | BCA, Paper-IX               | 2.30 PM to 5.30 PM  | Nalanda Open University, 2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna                                    |
| 14.01.2023 | BCA, Paper-X                | 2.30 PM to 5.30 PM  | Nalanda Open University, 2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna                                    |
| 16.01.2023 | BCA, Paper-XI               | 2.30 PM to 5.30 PM  | Nalanda Open University, 2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna                                    |
| 17.01.2023 | BCA, Paper-XII              | 2.30 PM to 5.30 PM  | Nalanda Open University, 2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna                                    |
| 19.01.2023 | BCA, Paper-XIII             | 2.30 PM to 5.30 PM  | Nalanda Open University, 2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna                                    |
| 21.01.2023 | BCA, Paper-XIV              | 2.30 PM to 5.30 PM  | Nalanda Open University, 2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna                                    |
| 24.01.2023 | BCA, Paper-XV               | 2.30 PM to 5.30 PM  | Nalanda Open University, 2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna                                    |
| 25.01.2023 | BCA, Paper-XVI              | 2.30 PM to 5.30 PM  | Nalanda Open University, 2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna                                    |
| 27.01.2023 | BCA, Paper-IX (Practical)   | 11.30 AM to 1.30 PM | <b>School of Computer Education &amp; IT,<br/>12<sup>th</sup> Floor, Biscomaun Tower,<br/>Patna-800001</b> |
| 28.01.2023 | BCA, Paper-X (Practical)    | 11.30 AM to 1.30 PM |  |
| 30.01.2023 | BCA, Paper-XI (Practical)   | 11.30 AM to 1.30 PM |  |
| 31.01.2023 | BCA, Paper-XII (Practical)  | 11.30 AM to 1.30 PM |  |
| 01.02.2023 | BCA, Paper-XIII (Practical) | 11.30 AM to 1.30 PM |  |
| 02.02.2023 | BCA, Paper-XIV (Practical)  | 11.30 AM to 1.30 PM |  |
| 03.02.2023 | BCA, Paper-XV (Practical)   | 11.30 AM to 1.30 PM |  |
| 03.02.2023 | BCA, Paper-XVI (Practical)  | 11.30 AM to 1.30 PM |  |

**SET-I**

**Nalanda Open University**  
**Annual Examination - 2022**  
**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 and their functions.
2. Write a shell script to display the greatest of three numbers entered from the keyboard.
3. Write a shell script to print the series of Fibonacci series upto 10 terms.

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**SET-II**

**Nalanda Open University**  
**Annual Examination - 2022**  
**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 and their functions.
2. Write a shell script to display the series of natural numbers upto 10 terms.
3. Write a shell script to print the factorial of a number entered from the keyboard.

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SET-I

**Nalanda Open University**  
**Annual Examination - 2022**  
**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.*

- Q1. Write at least 10 **IP Address** of class A, B and C. Also write the subnet mask for each.
- Q2. Draw various topologies used in networking and explain their advantages and disadvantages.
- Q3. Discuss the difference between a hub and a layer 2 switch.



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SET-II

**Nalanda Open University**  
**Annual Examination - 2022**  
**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.*

- Q1. Write at least 10 **IP Address** of class A, B and C. Also write the subnet mask for each.
- Q2. Draw the TCP/IP reference model and discuss the functions of each layer.
- Q3. Discuss the difference between a switch and router.



SET-I

**Nalanda Open University**  
**Annual Examination - 2022**  
**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.*

- Q1. Create a database in MS-Access. Now create a table name student with five attributes and enter at least 10 records in it.
- Q2. Write five queries of your own choice.
- Q3. Discuss the elements of DBMS.



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SET-II

**Nalanda Open University**  
**Annual Examination - 2022**  
**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.*

- Q1. Create a database in MS-Access. Now create a table name Teacher with five attributes and enter at least 10 records in it.
- Q2. Write five queries of your own choice.
- Q3. Describe different types of database.



SET-I

**Nalanda Open University**  
**Annual Examination - 2022**  
**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 about Nalanda Open University and define proper margin, header and footer. .
  - (b) Insert a table of 3 columns and 4 rows and enter some valid data into it.
  - (c) Insert a clip art in the document.
  - (d) Create a macro using keyboard.
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 - 2022**  
**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 about the advantages of BCA program you are doing and define proper margin, header and footer. .
  - (b) Insert a hyperlink in the document.
  - (c) Divide the document into 3 columns.
  - (d) Create a macro using toolbar 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.



SET-I

**Nalanda Open University**  
**Annual Examination - 2022**  
**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 stack operations.
2. Write a program in C to implement bubble sort.
3. Write a program in C to implement a binary search tree.

❧❧❧

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SET-II

**Nalanda Open University**  
**Annual Examination - 2022**  
**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 double linked list
2. Write a program in C to insert and delete in a queue.
3. Write a program in C to implement mergesort.

❧❧❧



SET-I

**Nalanda Open University**

**Annual Examination - 2022**

**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 Fibonacci series upto given term entered from the keyboard.
2. Write a program in C++ to implement multiple inheritance.
3. What is a constructor? Write a program in C++ using constructors.



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SET-II

**Nalanda Open University**

**Annual Examination - 2022**

**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 the sum of first 10 odd numbers.
2. Write a program in C++ to implement multilevel inheritance.
3. What is an operator overloading? Write a program in C++ to implement operator overloading.



SET-I

**Nalanda Open University**  
**Annual Examination - 2022**  
**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:

- a. RAM
  - b. SHYAM
  - c. MAHESH

2. Show with an example how hyperlink is created using HTML code.
3. Write a JavaScript function that checks whether a passed string is palindrome or not?



SET-II

**Nalanda Open University**  
**Annual Examination - 2022**  
**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:

The background color of the paragraph is Green

2. Write HTML code to create a table and insert data into it.
3. Write a JavaScript program to calculate the factorial of a number.



**Nalanda Open University**  
**Annual Examination - 2022**  
**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. Explain Desktop, Server and workstations. Also discuss the role of computer in networking.
2. Why memory important in computer? Discuss various storage devices used in computer system.
3. Why proper selection of Operating System important? Explain Network Operating System (NOS).
4. Explain different types of network topologies with diagram. Give examples for each.
5. Define networking. Discuss the role of networking. Explain peer-to-peer networking and give its advantages and disadvantages.
6. Explain the concept of message encoding, message formatting and message timing. What is flow control?
7. Explain the concept of LAN, MAN and WAN with examples.
8. Describe various networking devices and their functions. What is broadcasting message?
9. Discuss various types of transmission media used for networking with examples.
10. Write short notes on any **two**:
  - (i) Peripheral devices
  - (ii) Rules of Communication
  - (iii) Addressing
  - (iv) Internet Protocol (IP).



**EXAMINATION PROGRAMME-2022**  
**BCA (New Batch), Part-III**

| <b>Date</b>       | <b>Papers</b>                             | <b>Time</b>               | <b>Examination Centre</b>  |
|-------------------|---|---------------------------|--|
| 27.01.2023        | BCA, Paper-XVII                           | 2.30 PM to 5.30 PM        | Nalanda Open University,<br>2 <sup>nd</sup> Floor, Bismaun Bhawan, Patna                                 |
| 31.01.2023        | BCA, Paper-XVIII                          | 2.30 PM to 5.30 PM        | Nalanda Open University,<br>2 <sup>nd</sup> Floor, Bismaun Bhawan, Patna                                 |
| 02.02.2023        | BCA, Paper-XIX                            | 2.30 PM to 5.30 PM        | Nalanda Open University,<br>2 <sup>nd</sup> Floor, Bismaun Bhawan, Patna                                 |
| 04.02.2023        | BCA, Paper-XX                             | 2.30 PM to 5.30 PM        | Nalanda Open University,<br>2 <sup>nd</sup> Floor, Bismaun Bhawan, Patna                                 |
| 06.02.2023        | BCA, Paper-XXI                            | 2.30 PM to 5.30 PM        | Nalanda Open University,<br>2 <sup>nd</sup> Floor, Bismaun Bhawan, Patna                                 |
| 08.02.2023        | BCA, Paper-XXII                           | 2.30 PM to 5.30 PM        | Nalanda Open University,<br>2 <sup>nd</sup> Floor, Bismaun Bhawan, Patna                                 |
| 10.02.2023        | BCA, Paper-XXIII                          | 2.30 PM to 5.30 PM        | Nalanda Open University,<br>2 <sup>nd</sup> Floor, Bismaun Bhawan, Patna                                 |
| <b>13.02.2023</b> | <b>BCA, Paper-XXIV<br/>(Project-Viva)</b> | <b>12.00 Noon onwards</b> | <b>School of Computer Education &amp; IT,<br/>12<sup>th</sup> Floor, Bismaun Tower,<br/>Patna-800001</b> |

**Nalanda Open University**  
**Annual Examination - 2022**  
**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 engineering. Discuss the need and importance of software engineering.
2. Define and describe Software Development Life Cycle (SDLC).
3. What are umbrella activities in Software engineering? Explain.
4. Discuss spiral model with their advantages and disadvantages.
5. What is risk management? Discuss different types of risk. Why risk management is required during software development.
6. Explain different types of requirements? What is requirement validation checklist?
7. What is fact-finding technique? What are the tools used for fact-finding? Describe different types of requirements in detail.
8. Describe principles of Software design. What is abstraction?
9. Describe the components of DFD. Draw a DFD for “University Admission System” up to second level.
10. Write short notes on any **two**:
  - (a) Types of software
  - (b) Modularization
  - (c) Characteristics of SRS
  - (d) E-R-diagram



**Programme of B.C.A. Part-III**  
**Annual Practical Examination - 2022**

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

| <i>Date</i> | <i>Time</i>          | <i>Paper</i> | <i>Venue</i>  |
|-------------|----------------------|--------------|---|
| 11.02.2023  | 11.30 AM to 01.30 PM | XVII         | <b>12th Floor, Biscomaun Tower<br/>School of Computer Science</b> |
| 14.02.2023  | 11.30 AM to 01.30 PM | XIX          |   |
| 15.02.2023  | 11.30 AM to 01.30 PM | XX           |   |
| 16.02.2023  | 11.30 AM to 01.30 PM | XXI          |   |

**Nalanda Open University**  
**Annual Examination - 2022**  
**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. Discuss the features of Java. Compare and contrast between Java and C++.
2. Describe at least 10 keywords used in Java with their functions.
3. Discuss various data types used in Java programming with examples.
4. What is type conversion in Java? Explain automatic type conversion and generic type casting with examples.
5. What is class? How does it accomplish data hiding? How is a method defined in a class? Explain with the help of an example.
6. Define Inheritance. Explain different types of Inheritance with examples.
7. Compare and contrast overloading and overriding methods. When do we declare a method or class final?
8. What is an applet? Explain the importance of applet programming in Java and generate multiplication table of 5 through applet.
9. Define package? How to we tell Java that we want to use a particular package in a file? How do we design and add a class or an interface to a package? Explain with the help of an example.
10. Write short notes on any **two** of the following:
  - (a) Arrays in Java
  - (b) Threads in Java
  - (c) Looping statements in Java
  - (d) Operators in Java.



**Revised**

Programme of B.C.A. Part-III  
Annual Practical Examination - 2022

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

| <i>Date</i> | <i>Time</i>          | <i>Paper</i> | <i>Venue</i>  |
|-------------|----------------------|--------------|---|
| 11.02.2023  | 11.30 AM to 01.30 PM | XVII         | <b>12th Floor, Biscomaun Tower<br/>School of Computer Science</b> |
| 14.02.2023  | 02.30 PM to 05.30 PM | XIX          |   |
| 16.02.2023  | 02.30 PM to 05.30 PM | XX           |   |
| 17.02.2023  | 02.30 PM to 05.30 PM | XXI          |   |

**Nalanda Open University**  
**Annual Examination - 2022**  
**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. How DBMS different from traditional file system? What are the limitation of file based system? Explain.
2. Compare and contrast between network model and relational model of DBMS with examples.
3. Describe DBMS architecture. What are different types of data independence? Explain.
4. Draw an E-R Diagram for 'Railway Reservation System'. Explain each component used in the diagram.
5. Describe at least 10 SQL commands with their syntax and use.
6. Explain the concept of Specialization, Generalization and Inheritance with the help of an example.
7. Explain DDL, DML and DCL with at least two examples of each.
8. What is Normalization? Why it is required? Explain various types of normalizations with the help of examples.
9. Define transaction. What are the properties of a transaction? Explain with the help of example.
10. Write short notes on any **two**:
  - (a) Database administrator
  - (b) Views
  - (c) Index
  - (d) Types of attributes.



**Revised**

Programme of B.C.A. Part-III  
Annual Practical Examination - 2022

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

| <i>Date</i> | <i>Time</i>          | <i>Paper</i> | <i>Venue</i>  |
|-------------|----------------------|--------------|---|
| 11.02.2023  | 11.30 AM to 01.30 PM | XVII         | <b>12th Floor, Biscomaun Tower<br/>School of Computer Science</b> |
| 14.02.2023  | 02.30 PM to 05.30 PM | XIX          |   |
| 16.02.2023  | 02.30 PM to 05.30 PM | XX           |   |
| 17.02.2023  | 02.30 PM to 05.30 PM | XXI          |   |



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

(Computer Oriented Numerical Technique)  
Annual Examination, 2022

Time : 3 Hours.

Full Marks : 80

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

- (a) Obtain the smallest positive root of the Equations of  $x^3 - 5x + 1 = 0$  by using 3 iterations of the bisection method.

(b) Using the Newton-Raphson method. Find the square root of 12 with initial approximation  $x_0 = 3$ .
- Solve the system of equations :—

$$16x_1 + 22x_2 + 4x_3 = -2$$
$$4x_1 - 3x_2 + 2x_3 = 9$$
$$12x_1 + 25x_2 + 2x_3 = -11$$
- Solve the following system of equations by Jacobi's iteration method.

$$3x + 20y - z = -18$$
$$2x - 3y + 20z = 25$$
$$20x + y - 2z = 17$$

- (a) Using Lagrange's formula to find the value of  $f(8)$ . Given

|        |    |     |     |     |      |      |
|--------|----|-----|-----|-----|------|------|
| $x$    | 4  | 5   | 7   | 10  | 11   | 13   |
| $f(x)$ | 48 | 100 | 294 | 900 | 1210 | 2028 |

- (b) Estimate the value of  $f(1.42)$  from the given data.

|        |        |        |        |        |        |
|--------|--------|--------|--------|--------|--------|
| $x$    | 1.1    | 1.2    | 1.3    | 1.4    | 1.5    |
| $f(x)$ | 1.3357 | 1.5095 | 1.6984 | 1.9043 | 2.1293 |

- 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 |

- (a) State and prove Trapezoidal Rule.

(b) Find the approximate value of  $I = \int_0^1 \frac{dx}{1+x}$  using Simpson's  $\frac{1}{3}$  rd Rule,  $n = 8$ .
- Use 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  $y' = x^2 + y^2$ ,  $y(0) = 0.5$  at  $y(0.4)$  taking  $h = 0.2$ .
- Solve the following IVP using Runge-Kutta fourth order method  $y' = 1 - 2t y$ ,  $y(0.2) = 0.1948$ . Find  $y(0.4)$  taking  $h = 0.2$ .
- Find Newton's Backward difference form of Interpolating Polynomial for the data.

|        |    |    |    |     |     |     |     |
|--------|----|----|----|-----|-----|-----|-----|
| $x$    | 4  | 6  | 8  | 10  | 12  | 14  | 16  |
| $f(x)$ | 19 | 40 | 79 | 142 | 205 | 296 | 359 |

Hence interpolate  $f(15)$





**Nalanda Open University**  
**Annual Examination - 2022**  
**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 and describe Finite Automata with the help of an example:
2. Draw finite automata corresponding to the following regular expression:
  - (i)  $(a + b + c) a^*$
  - (ii)  $(ac + ca)^*$
  - (iii)  $a^*abb^*(b+d)$
  - (iv)  $aab^*c+abcc^*$
3. Define Regular expression. Write and explain the rules of writing a regular expression.
4. Differentiate between Deterministic Finite Automata (DFA) and Non-Deterministic Finite Automata (NFA). Give examples for each.
5. Explain pumping lemma for Regular Grammar. . Prove that  $L=\{a^p \mid p \text{ is prime}\}$  is not regular.
6. Construct Finite automata for each of following languages:
  - (i)  $L: \{x \in \{a, b\}^*: \text{each word starts with a and ends with b}\}$
  - (ii)  $L: \{x \in \{a, b\}^*: \text{all words with even numbers of a's}\}$
7. Discuss Chomsky classification of Grammar with examples.
8. Define Context Free Grammar. Discuss closure properties of CFG with examples.
9. Define Ambiguity. Show ambiguity of grammar using parse tree. How ambiguity can be resolved?
10. Write short notes on any two of the following:
  - (i) Push Down Automata
  - (ii) Turing Machine
  - (iii) Undecidable languages.



**Revised**

Programme of B.C.A. Part-III  
Annual Practical Examination - 2022

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

| <i>Date</i>       | <i>Time</i>                 | <i>Paper</i> | <i>Venue</i>  |
|-------------------|-----------------------------|--------------|---|
| <b>11.02.2023</b> | <b>11.30 AM to 01.30 PM</b> | XVII         | <b>12th Floor, Biscomaun Tower<br/>School of Computer Science</b> |
| <b>14.02.2023</b> | <b>02.30 PM to 05.30 PM</b> | XIX          |   |
| <b>16.02.2023</b> | <b>02.30 PM to 05.30 PM</b> | XX           |   |
| <b>17.02.2023</b> | <b>02.30 PM to 05.30 PM</b> | XXI          |   |

**Nalanda Open University**  
**Annual Examination - 2022**  
**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 between Ring and star topology.
2. Discuss different IP Class Address with examples.



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**Nalanda Open University**  
**Annual Examination - 2022**  
**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 Mesh and Bus topology.
2. Discuss different types of networking devices.



**Nalanda Open University**  
**Annual Examination - 2022**  
**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 Single inheritance.
2. Write a program in Java to implement Polymorphism.



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**Nalanda Open University**  
**Annual Examination - 2022**  
**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 multilevel inheritance.
2. Write a program in Java using switch statement.



**Nalanda Open University**  
**Annual Examination - 2022**  
**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 Railway Reservation System.



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**Nalanda Open University**  
**Annual Examination - 2022**  
**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 Bank Information System.



**Nalanda Open University**  
**Annual Examination - 2022**  
**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?



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**Nalanda Open University**  
**Annual Examination - 2022**  
**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.

