

Nalanda Open University

Annual Examination - 2016

Bachelor in Computer Application (BCA), Part-I

Paper-I [Foundation Course in English for Computing (CS-610)]

Time: 3.00 Hrs.

Full Marks: 80

Answer all questions.

1. Read the passage given below and answer the questions that follow:

There was a great excitement in the school. We were a set of four brothers known for our toughness. We had proved it again. 'A king cobra'. 'Six feet long'. The tin was presented to the science teacher. It was on the teacher's table and we waited for him to open it and admire our kill. The teacher pretended to be indifferent and set us some problems to work on. With studied matter-of-factness, he fetched his forceps and a jar. He began to hum and untie the cord around the box. As soon as the cord was loosened, the lid flew into the air, just missing the teacher's nose. There was Kala Nag. His eyes burnt like embers CS-610 1 P.T.O. and his hood was taut and undamaged. With a loud hiss, he went for the teacher's face. The teacher pushed himself back on the chair and toppled over. He fell on the floor and stared at the cobra petrified with fear. The boys stood up on their desks and yelled hysterically.

Kala Nag surveyed the scene with blood shot eyes. His forked tongue darted in and out excitedly. He spat furiously and then made a bid for freedom. The lid fell out of the tin on the floor with a loud plop. His back was broken in several places and he dragged himself painfully to the door.

- (a) What did the four brothers bring to the school and what was their attitude? 4
- (b) What happened when the teacher loosened 2 the cord around the tin? 3
- (c) What happened to the teacher when the 2 Kala Nag darted towards his face? 3
- (d) Find words from the text that are close in 2 meaning to 2
- (i) behaviour exhibiting excessive or uncontrollable emotions.
- (ii) Stunned with terror, fear
- (e) Give a suitable title to the passage given above. 3
- 2. Write an essay of about 400 words on any one of the following: 20**
- (a) ICT and mass empowerment
- (b) Technology is a good servant but a bad master
- (c) Life without a mobile phone.
- 3. (a) Rewrite the following sentences as directed. 2**
- (i) I gave you a book on Saturday. I need the book (Combine using a defining relative clause)
- (ii) This computer is a very old model. It will not support the new software. (Combine using "too").
- (b) Fill in the blanks with suitable options from the ones given in the brackets. 3
- (i) It is not normal for this program to get stuck. There----- (will/must) be some conflict with another program.

P.T.O

(ii) People (have used/have been using) computers for the last twenty five years now. They (have begun/have been beginning) to depend on them.

4. Write a paragraph in about 200 words on any one of the following: 15

- (a) Constantly upgrading gadgets (machines) in a modern day problem.
- (b) Managing stress in life.
- (c) Using unconventional energy resources.

5. Rewrite the following sentences removing the errors if any: 5

- (a) The accepting letters from two candidates have come.
- (b) Nowadays you can make your PC to perform many functions simultaneously.
- (c) Humans today hope to become space tourists.
- (d) Adjustment means making up with whatever one has.
- (e) The tablet PC is lighter to the Note book because it does not have a CD drive.

6. Read the following passage and summarize it to one-third of its length. Give a suitable title- 20

Akbar was a man far in advance of his time. So potent was his persona that only those most gifted and possessed of a strong sense of self - worth could stand up to him. It was a trait that was to have fateful consequences for his heirs.

Akbar had three sons: Salim, Murad and Daniyal, born to him in 1569, 1570 and 1572 respectively. Yet, by 1608 only Salim still lived: the other two had self-destructed through addiction to opium and alcohol. At the time of his father's death, Salim too had become fond of stimulants and subject to the most capricious mood swings. When in the grip of arrack and opium, between 1600 and 1605 he also led a series of revolts against Akbar, and war between father and son was averted only through the intervention of Akbar's senior begins and by Salim's own realisation that he was militarily no match for his father. Despairing over the successor Akbar's mind turned to one who, by widespread comment had all the required qualities to succeed him, Salim's eldest son Khusram. Khusram was born in October 1587 to Salim and Man Bai. He soon grew up to be a court favourite. He had a pleasing presence and excellent personality, and was exceedingly beloved of the common people. At 18 Khusram was personable, brave and a talented battlefield commander.

(Adapted from Khusram: The shadow of power from The Hindu Magazine, February 28, 2010).



**Examination Programme-2016(Revised)
Bachelor of Computer Application (BCA Part – I)**

Date	Papers	Time	Examination Centre
27/3/2016	BCA Paper-I	08 to 11 am	Nalanda Open University, Patna
29/3/2016	BCA Paper-II	08 to 11 am	Nalanda Open University, Patna
31/3/2016	BCA Paper-III (Practical)	12 Noon to 03 pm	12th Floor, Biscomaun Tower, Patna
02/4/2016	BCA Paper-IV	08 to 11 am	Nalanda Open University, Patna
04/4/2016	BCA Paper-V	08 to 11 am	Nalanda Open University, Patna
05/4/2016	BCA Paper-VI (Practical)	12 Noon to 03 pm	12th Floor, Biscomaun Tower, Patna

Nalanda Open University
Annual Examination - 2016
Bachelor in Computer Application (BCA) Part-I
Paper-II (Foundation Course in Humanities and Social Sciences) BHSF –101

Time: 3.00 Hrs.

Full marks: 80

Answer five questions. Question No.1 is compulsory.
पाँच प्रश्नों के उत्तर दीजिए । प्रश्न संख्या एक अनिवार्य है ।

1. (a) Mark correct \checkmark or Wrong X. as the case may against each of the following sentence $8 \times 1 = 8$
अधोलिखित में से प्रत्येक, के सामने सही (\checkmark), अथवा गलत (\times), जैसी स्थिति हो, का चिह्न लगावें ।
- (i) The Government of South Africa follows a racist policy (true/false)
दक्षिण अफ्रीका की सरकार एक नस्लवादी नीति का पालन करती है (सही/गलत)
- (ii) The population in the Neolithic Age was on the decrease. (true/false)
नव पाषाण काल में जनसंख्या घट रही थी । (सही/गलत)
- (iii) Urban settlements were there in the stone Age. (true/false)
पाषाण काल में शहरीकरण हो गया था । (सही/गलत)
- (iv) The revolt of 1857 was only a sepoy mutiny. (true/false)
1857 के विद्रोह के केवल एक सिपाही विद्रोह था (true/false)
- (v) The feudal society was a class-less society. (true/false)
सामन्ती समाज एक वर्गहीन समाज था । (सही/गलत)
- (vi) 'Humanism' was a great contribution of Renaissance. (true/false)
मानववाद पुनर्जागरण की महान देन थी । (सही/गलत)
- (vii) Renaissance contributed to the development of secular ideas. (true/false)
पुनर्जागरण ने धर्मनिरपेक्ष विचारों के विकास में योगदान दिया । (सही/गलत)
- (viii) Nation-states emerged in a very short time in Europe. (true/false)
यूरोप में थोड़े समय में राष्ट्र-राज्यों का उदय हो गया । (सही/गलत)
- (ix) Bartholomew Diaz sailed to America in 1492. (true/false)
बार्थोलोम्यू डायज 1462 में समुद्री यात्रा करके अमेरिका पहुँचा । (सही/गलत)
- (x) The drain theory was put forward by the Western Scholars. (true/false)
ड्रेन सिद्धान्त पश्चिमी विद्वानों ने प्रस्तुत किया था । (सही/गलत)
- (xi) Compass is used to measure distance. (true/false)
दिशा सूचक यंत्र दूरी मापने के काम आता है । (सही/गलत)
- (xii) The First Five Year Plan emphasized on development of irrigation capacity. (true/false)
प्रथम पंचवर्षीय योजना ने सिंचाई क्षमता के विकास पर बल दिया । (सही/गलत)
- (xiii) Direct attack on poverty was a plan strategy during the 1980s. (true/false)
1980 के दशक के दौरान योजना की रणनीति गरीबी पर प्रत्यक्ष प्रहार थी । (सही/गलत)
- (xiv) Trickle down effect visualised that rice farmers would benefit from green revolution. (true/false)
थोड़ा-थोड़ा करके मिल रहे प्रभावों से प्रतीत हुआ कि हरित क्रांति से लाभ धनी किसानों को होगा । (सही/गलत)

- (xv) Mahalanobis model formed the basis of the Second Plan. (true/false)
महालनोबिस मॉडल दूसरी पंचवर्षीय योजना का आधार बना । (सही/गलत)
- (xvi) Is diffusion one of the causes of social change? (true/false)
क्या प्रसार सामाजिक परिवर्तन के कारणों में से एक है । (सही/गलत)
2. Discuss the various forms of human-nature interactions.
मानव-प्रकृति परस्पर क्रिया के विभिन्न रूपों की विवेचना कीजिये ।
3. Write a note on the rise of nation-states.
राष्ट्र-राज्यों के उदय पर एक निबंध लिखिए
4. Discuss the Western and Indian viewpoints on the impact of Colonial rule.
औपनिवेशिक शासन के प्रभाव पर पश्चिमी और भारतीय दृष्टिकोण की विवेचना कीजिये
5. Discuss in brief the socio-economic factors that gave rise to Renaissance.
पुनर्जागरण के उदय के लिए उत्तरदायी सामाजिक-आर्थिक-कारकों की संक्षिप्त विवेचना कीजिये ।
6. What do you understand by Reservation? How has the policy of reservations helped the marginalised social groups?
आरक्षण आप क्या समझते हैं? आरक्षण की नीति ने किस प्रकार मुख्यधारा से कटे हुए सामाजिक समूहों की मदद की है ?
7. What are the important features of Indian Constitution?
भारतीय संविधान के महत्वपूर्ण विशेषताएं क्या हैं?
8. What do you understand by Economic reforms in India? Explain.
भारत में आर्थिक सुधारों से आप क्या समझते हैं ? स्पष्ट कीजिये ।
9. Describe the features of the earliest cave paintings in India.
भारत में प्रारंभिक गुफा चित्रों की विशेषताओं का वर्णन कीजिये ।
10. How can education lead to development in a country like India ? Give reasons.
शिक्षा भारत जैसे देश में विकास की दिशा किस प्रकार निर्धारित कर सकती है? कारण दीजिये।

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(Answer one question from section A and all the questions from section B.)

Section -A

1. Explain Von Neumann Architecture with a block diagram? What is its bottleneck?
2. Explain different types of transmission media used for networking.

Section-B

(Write all the steps in your copy.)

3. Perform the following tasks using MS-Word document:
 - (a) Write one paragraph about Nalanda Open University and define proper margin, header and footer. .
 - (b) Protect the document using a password.
 - (c) Insert a clip art in the document.
 - (d) Reformat the document in two columns.
4. Perform the following tasks using MS-Windows:
 - (a) Change the display settings of your display.
 - (b) Install a new printer.
 - (c) Interchange the functions of left and right buttons of the mouse.
 - (d) Make a folder sharable.
5. Write a letter to you are your friends for inviting them for your birthday party using Mail-merge option. Create at least 10 addresses of your friends.
6. Write short notes on:
 - (a) WWW
 - (b) Network Topologies
 - (c) Search engines.



(Answer one question from section A and all the questions from section B.)

Section -A

1. Describe different input and output devices used in computers.
2. Explain OSI model of Networking with the functions of each layer.

Section-B

(Write all the steps in your copy.)

3. 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) Protect the document using a password.
 - (c) Insert a bookmark..
 - (d) Create a hyperlink in the document.
4. Perform the following tasks using MS-Windows:
 - (a) Change the background of your desktop.
 - (b) Change the system date and time.
 - (c) Change the mouse button.
 - (d) Hide the icons on the desktop.
5. Create a macro using keyboard and toolbar option.
6. Write short notes on:
 - (a) Network devices
 - (b) Internet
 - (c) Browsers.



NALANDA OPEN UNIVERSITY
Annual Examination 2016
Bachelor of Computer Application (BCA), Part – I
Paper – IV (PC SOFTWARE SKILLS, CS - 612)

Time: 3 hours

Maximum Marks: (80)

Answer any five questions. Answer all the questions.

1. Explain different components of MS-EXCEL with example.
2. What is a macro? Explain its utility in MS-Excel. Write steps for recording and running a macro.
3. Explain the best way of solving **Decanting problems** and provide a solution for the following problem:-
You are provided 3 vessels. The capacities are 12, 9 and 5 liters. The 12-litre vessel is full of water. How can you divide the water in the 12-litre vessel into two equal portions?
4. What are the advantages of using Internet? Briefly explain the working of Internet. Also explain different methods of connecting to the Internet.
5. Explain different types of charts created in MS-Excel? Explain any six chart components.
6. Write the basic functionality of the following in MS-Excel components :
(i) Format Painter (ii) Chart Wizard (iii) Firewall
7. What is the significance of Domain Name System? List some domain names.
8. What is a decision tree? Draw and explain a decision tree by giving an example of your own choice.
9. Write the major difference between a Worksheet and a Workbook. Explain any three ways of restricting access to a Workbook.
10. Write short notes on any three:
 - (i) FTP
 - (ii) Pivot Table
 - (iii) WWW
 - (iv) Complexity problem



Nalanda Open University
Annual Examination - 2016
Bachelor in Computer Application (BCA), Part-I
Paper-V [Foundation Course in Mathematics in Computing (CS-60)]

Time: 3.00 Hrs.

Full Marks: 80

Answer any five questions. All questions carry equal marks.

1. Find the limits :

(a) $\lim_{x \rightarrow 4} \frac{x^3 - 2x^2 - 9x + 4}{x^2 - 2x - 8}$ (b) $\lim_{x \rightarrow 0} \frac{3 \sin x - \sin 3x}{x^3}$ (c) $\lim_{x \rightarrow 0} \frac{a^x - 1}{x}$ (d) $\lim_{x \rightarrow 0} \frac{\cos 7x - \cos 9x}{\cos 3x - \cos 4x}$

2. (a) To find differential coefficient of $\tan x$ with respect to x with the help of first principle.

(b) To find the square root of $7-24i$

3. (a) To find the cube roots of unity.

(b) If $U = \{0, 1, 2, \dots, 9\}$

$$A = \{0, 1, 2, 3, 4\}, B = \{1, 2, 3\}$$

$$C = \{5, 6, 7\}, D = \{5, 7, 8, 9\}$$

Find the following (i) $A \cup B$ (ii) A' (iii) $A - B$ (iv) $C - D$

$$\frac{x^2}{y^2} + \frac{y^2}{x^2} - \frac{1}{i} \left(\frac{x}{y} - \frac{y}{x} \right) - \frac{9}{4}$$

4. Find $\frac{dy}{dx}$:

(a) $y = x^2 \cos x \cdot \cot x$ (b) $y + x = \sin(x + y)$ (c) $x = a \cos^3 \theta, y = b \sin^3 \theta$ (d) $y = e^{(x^2 + 2x)}$

5. (a) Find the Maximum and Minimum values of $x^3 - 2x^2 + x + 6$

(b) Solve the following simultaneous equations by Cramer's Rule.

$$3x - 2y - 2z = 1$$

$$-x + y - 4z = 13$$

$$2x - 3y - 4z = 8$$

6. Integrate the following : (i) $\int \frac{(\log x)^2}{x} dx$ (b) $\int \frac{3-x^2}{1+x^2} dx$ (iii) $\int \frac{e^{2x} - e^{4x}}{e^x - e^{-x}} dx$

(iv) $\int \frac{xe^x}{(x+1)^2} dx$

7. Solve the following equations by Descard's method.

(a) $x^4 - 2x^2 + 8x - 3 = 0$

(b) $x^4 + 8x^3 + 9x^2 - 8x - 10 = 0$

8. Find the vertex, axis, focus, Directrix, tangent at the vertex and length of the latus rectum of the Parabola.

$$2y^2 + 3y - 4x - 3 = 0$$

9. Find the equation of the ellipse whose foci one $(2, 3)$, $(-2, 3)$ and whose semi - minor axis is $\sqrt{5}$.

10. Find the equation to the hyperbola if the distance between the foci is 9 and eccentricity is $\sqrt{3}$.



Nalanda Open University
Annual Examination - 2016
Bachelor in Computer Application (BCA), Part-I
Paper-VI Practical [C Programming and Data Structure (CS-62P)]

Set-A

Time: 3.00 Hrs.

Full Marks: 100 (80+20)

Answer any four questions. All questions carry equal marks.

1. Write a program in 'C' language for the implementation of Bubble Sort.
2. Write a program in 'C' language that accepts a string as input and checks whether it is a palindrome or not.
3. What is a queue? Write an algorithm to implement circular queue.
4. Write a program in 'C' language for the implementation of a Doubly Linked List.
5. What is Binary Search Tree(BST)? Write an algorithm to insert a node in BST.



Nalanda Open University
Annual Examination - 2016
Bachelor in Computer Application (BCA), Part-I
Paper-VI Practical [C Programming and Data Structure (CS-62P)]

Set-B

Time: 3.00 Hrs.

Full Marks: 100 (80+20)

Answer any four questions. All questions carry equal marks.

1. Explain the difference between a linked list and doubly linked list. Write an algorithm to create a linked list and check whether it is empty or not.
2. Define AVL tree. Construct a height balanced tree for the following list of elements:

5, 3, 2, 6, 10, 15, 1, 17, 20, 4, 12
3. Write a program in 'C' language that accepts three matrices M1, M2 and M3 as input. The program should compute $M1 * M2 + M3$ and print the resultant matrix.
4. What is a B-tree? Write a program in C to implement a B-tree.



Nalanda Open University

Annual Examination - 2016

Bachelor in Computer Application (BCA), Part-II

Paper-VII (Fundamental Course in Science and Technology), FST-01

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 pollution, explain in detail causes of water pollution.
प्रदुषण क्या है, विशेष रूप से जल प्रदुषण के कारणों का वर्णन कीजिए।
2. Write short answers for the following questions:
अधोलिखित प्रश्नों के लिए संक्षिप्त उत्तर लिखिए।
 - (a) What are the salient features of mixed and relay-cropping system?
मिक्सड एवं रिले-क्रॉपिंग प्रणाली की क्या प्रमुख विशेषताएँ हैं?
 - (b) What points should one keep in mind while using fertilizers?
उर्वरक का प्रयोग करते समय किन-किन बिन्दुओं पर ध्यान रखना चाहिए?
3. Write the name of the causative microbe for the following diseases.
निम्नलिखित रोगों के उत्पादक माईक्रोबों के नाम लिखिए।

(a) Cholera (हैजा)	(b) Ring Worm (दाद)	(c) AIDS (एड्स)
(d) Chiken Pox (छोटी माता)	(e) Malaria (मलेरिया)	(f) Conjunctivitis (नेत्र-श्लेष्मला)
(g) Guinea Worm (गिनी-कृमि)	(h) Leprosy (कुष्ठ)	
4. Discuss the reasons for development of science in European society during post renaissance period. Describe the factors responsible for Industrial Revolution.
पुनर्जागरण के बाद की अवधि के दौरान यूरोपीय समाज में विज्ञान के विकास के कारणों की चर्चा कीजिए। औद्योगिक क्रांति के लिए जिम्मेदार कारकों का वर्णन करें।
5. Define and distinguish with example any Three of the following pairs:-
अधोलिखित युग्मों से किन्हीं तीन को परिभाषित कीजिए एवं सोदाहरण विभिन्नता बताइये:-
 - (a) Paleontology and Archaeology (जीवाश्म विज्ञान एवं पुरातत्वविज्ञान)
 - (b) Alchemy and Amalgamation (कीमियागर एवं अमलगमन)
 - (c) Telescope and Spectroscopy (टेलीस्कोपी एवं स्पैक्ट्रोस्कोपी)
 - (d) Calligraphy and Cartography (कैलिग्राफी एवं कार्टोग्राफी)
6. Describe the role of AIR and Doordarshan in educatin.
शिक्षा में आकाशवाणी और दूरदर्शन की भूमिका बताइए।
7. Comment briefly on agriculture in the following special areas:-
निम्नलिखित विशेष क्षेत्रों में कृषि के बारे में संक्षेप में लिखिए:-
 - (a) Arid zone (शुष्क प्रदेश)
 - (b) Dry land (सूखी भूमि)
 - (c) Hilly land (पहाड़ी प्रदेश)
8. What is Balanced Diet? Describe the composition of Balance Diet for an adult.
संतुलित आहार क्या है? एक वयस्क के लिए संतुलित आहार के घटकों का वर्णन कीजिए।
9. What do you mean by alternate food resources? Briefly discuss the advancements our country has made in their production.
वैकल्पिक खाद्य स्रोतों से आपका क्या तात्पर्य है? इन साधनों के उत्पादन के लिए हमारे देश में हुयी प्रगति की संक्षेप में चर्चा कीजिए।
10. Explain the theory of chemical evolution and give its scientific basis.
रासायनिक विकास के सिद्धांत की व्याख्या कीजिए और इसके वैज्ञानिक आधार के बारे में बताएं।

Nalanda Open University
Annual Examination - 2016
Bachelor in Computer Application (BCA), Part-II
Paper-IX (Element of System Analysis and Design)

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. List and explain the basic elements of a flowchart. What are different studies done as part of feasibility study? Explain them.
2. Draw a Data Flow Diagram (DFD) upto level-2 depicting various processes, data flow and data repertories for an "Admission system of NOU".
3. Explain the meaning of Planning, Production and Distribution of Multimedia. Explain at least three different approaches for Software evaluation. Define an audit trail. Who uses an audit trail ?
4. Differentiate between 3rd generation languages and 4th generation languages. Give one example language for each generation.
5. Explain what kind of fact finding techniques you would use for deciding on the design of a new application/system for some Internet Service Provider (ISP).
6. Write short notes on the following:
 - (a) Decision table
 - (b) Data dictionary
 - (c) Disaster Recovery Planning
7. Enumerate the factors that are important to the quality of a software system. Illustrate their significance in a qualitative manner with examples.
8. What are the various special systems tests? Explain at least four of them "Conversion is the process of changing from the old system to the newly developed one." Explain any three methods of conversion.
9. List and explain the basic factors to be considered in the selection of file media and file organization method. Explain the three primary classifications of the forms mentioning their characteristics along with an example for each.
10. Explain at least five duties that have to be carried out by a Systems Analyst. Explain the sequential method for file organization. Also explain two advantages and two disadvantages of this method vis-a-vis other methods.

Nalanda Open University
Annual Examination - 2016
Bachelor in Computer Application (BCA), Part-II
Paper-X (Database Management System)

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. A university registrar's office maintains data about the following entities:
 - (i) Course, including number, title, credits, syllabus and prerequisites
 - (ii) Course offering, including course number, year, semester, section number, instructors, timings and classroom.
 - (iii) Students, including student-id, name and program.
 - (iv) Instructors, including identification number, name, department and title.

Construct an E - R diagram for the Registrar's office. Document all assumptions that you make about the mapping constraints.
2. Discuss the three level architecture of DBMS. Explain how it leads to data independence. With the help of an example, explain the inverted file organization.
3. What is a view? Explain with the help of an example. Also specify the five conditions that a view must meet in order to allow the updates.
4. Explain the concepts of Generalization and Specialization with examples. Mention the features of OODBMS and give four advantages of it.
5. What are the general resistances faced by an organization while implementing DBMS tool? Explain at least four of them. What is client/server computing? Discuss the components of client/server computing.
6. Explain any three aggregate functions of SQL with an example for each. Explain the structure of Index sequential file with the help of a diagram.
7. Explain briefly:
 - (i) Dynamic Data Exchange (DDE)
 - (ii) Object Linking & Embedding (OLE)
8. Illustrate the differences between hierarchical and network data models. Explain why relational data model is a better choice over the two.
9. Explain the concept of two phase locking. Also, show that it guarantees serializability. Define the following operations of relational algebra giving an example for each:
 - (i) Division
 - (ii) Cartesian product
10. With the help of two examples for each, explain the use of multimedia databases and knowledge databases. Why is the administration of a database system required? What are the various functions associated with database administration?

Nalanda Open University
Annual Examination - 2016
Bachelor in Computer Application (BCA), Part-II
Paper-XI (Introduction to Computer Organization)

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. Convert the following:
 - (i) 1165 to its BCD equivalent.
 - (ii) $(334)_8$ to Decimal number.
 - (iii) 467 to its Binary equivalent.
 - (iv) $(1100110010)_2$ to Hexadecimal number.
2. Simplify the following Boolean function using Sum-of-Product form, by Karnaugh's map: $F(A, B, C, D) = \sum (0, 2, 3, 5, 7, 8, 10, 13, 15)$. Also draw the circuit diagram for it.
3. Design a combinational circuit that accepts a 3 bit binary number and generates an output binary number equal to 1 if the sum of input numbers are equal to '10' in binary, otherwise the output is 0.
4. Write a program in 8086 assembly language to generate the first five terms of the Fibonacci sequence. Also draw an appropriate flow chart for your program.
5. Describe memory hierarchy in computers. Explain the main memory to-cache mapping using a set associative scheme, with the help of an example.
6. "Counter is a register." Justify this statement. Draw and explain the working principles of a 4 bit ripple counter.
7. In some situation, multiple interrupts occur at the same time. Explain how one can deal with these multiple interrupts. Give any two approaches.
8. Using four (4×1) multiplexers and four full adders, construct a 4 bit arithmetic circuit, with the help of suitable tables, explain how this circuit can perform different arithmetical operations.
9. What is bus arbitration? Explain the Daisy chaining and polling bus arbitration methods with the help of a suitable diagram for each. Draw any two DMA configurations and explain the advantages and disadvantages of these configurations.
10. What is the need of many addressing modes in a machine? Explain different types of addressing modes with examples.

Nalanda Open University
Annual Examination - 2016
Bachelor in Computer Application (BCA), Part-II
Paper-XIII (Multimedia) CS-66

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 multimedia? Explain at least five applications of multimedia in distance education. What is the need of interface design? Explain five fundamental rules for interface design in multimedia applications.
2. What is copyright? List and explain two legal issues related to copyright in multimedia application development. What is hypertext? Explain any two application areas of hypertext.
3. List and explain two input and two output devices for multimedia systems. What is a multimedia component? Explain any four components (except video) of multimedia with an example of each.
4. What is digital video? Explain the use of digital video in developing multimedia applications. What is authoring software? Explain three features of authoring software.
5. Explain the need for planning a multimedia application. Explain the need of logic flow chart for development of interactive multimedia application with an example.
6. Explain at least six features of ImageQ. What is a sound card? Explain the process of sound card installation.
7. What are annotations? Explain the role of annotations in the applications of hypertext with an example.
8. Explain the statement "Multimedia productions are tailored to specifically meet the users' needs with an example. Explain any two multimedia features which can be used in business.
9. Explain, how multimedia Director is used to develop a multimedia application. Explain any four rules to be used in designing the computer based instructional materials.
10. (a) Explain the following in context of multimedia :
(i) Simulations (ii) Web-Based Tutor (WBT)
(b) Explain the use of any two multimedia software.

Nalanda Open University
Annual Examination - 2016
Bachelor in Computer Application (BCA), Part-II
Paper-VIII (Introduction to System Software) CS-63

Time: 3.00 Hrs.

Full Marks: 100(80+20)

Answer any four questions. All questions carry equal marks.

1. Write a shell script to rename any file name given as a command argument.
2. List and execute the following UNIX commands:
 - (a) To change the password of a user.
 - (b) To display the long listing of all, the files in the current directory.
 - (c) To select all the file-names whose file name starts with "t" in the current directory?
 - (d) To run any process at background.
 - (e) To search for a particular pattern in a file and display its count (no. of occurrences)
3. Write a shell program to find whether a given number is an Armstrong number or not. (Example: 153 is Armstrong number as $153 = 13+53+33$).
4. What are the limitations of a one-pass assembler? Explain the additional tasks that are performed in two pass assemblers over one-pass assemblers.
5. Explain necessary conditions for the occurrence of a Deadlock.

Nalanda Open University
Annual Examination - 2016
Bachelor in Computer Application (BCA), Part-II
Paper-VIII (Introduction to System Software) CS-63

Time: 3.00 Hrs.

Full Marks: 100(80+20)

Answer any four questions. All questions carry equal marks.

1. Write a shell program which writes all the odd-numbered lines of a text-file into another file.
2. List and execute the following UNIX commands:
 - (a) To set the file permissions of any given file: read, write, execute permissions for the owner' and execute permission to the group, and read and execute permissions to the others.
 - (b) Create a file using any editor.
 - (c) To display various processes running.
 - (d) To scan directories and locate any file, given the file-name by the user.
 - (e) To send a message to any user who is already logged in.
3. Write an algorithm and draw the corresponding flowchart for generating the Fibonacci series.
4. What is a scheduler? Explain any two types of schedulers.
5. What are the advantages of dynamic partition memory management?

Nalanda Open University
Annual Examination - 2016
Bachelor in Computer Application (BCA), Part-II
Paper-XII (Windows Programming) CS-65

Time: 3.00 Hrs.

Full Marks: 100(80+20)

Answer all questions. All questions carry equal marks.

1. Create a form in VB where the user can enter text into a text box and have the result output into a label in a different font after pressing a command button.
2. Write a function which takes a string from a text box in "word1, word2,.. " format and reverses it. Print the reversed string and its length in a label in format "reverse string: length". Build appropriate form to test your function.
3. Write an event procedure to count the number of blanks, tabs and newline characters in a given string. Use appropriate controls and provide a user friendly interface.
4. Describe the components of VB.

Nalanda Open University
Annual Examination - 2016
Bachelor in Computer Application (BCA), Part-II
Paper-XII (Windows Programming) CS-65

Time: 3.00 Hrs.

Full Marks: 100(80+20)

Answer all questions. All questions carry equal marks.

1. Create a "You" form, which asks the user their name, and address then says "Hello name and address". Give choice to user to change the size and font of name and address displayed by selecting from the lists named Your Size and Your Fonts. The form can be stopped by clicking a suitable Command Button.
2. Build a form with two drop down lists (combo boxes type 0), one for Name and the other for Roll Number. When this form is loaded, fill the lists from the arrays. If the user pulls down one of the lists and clicks on a Name (or Roll Number) the corresponding Roll Number (or Name) is displayed in the text box of the other list.
3. Create a form with a Label and display system time in appropriate form, font and color on that label.
4. Describe the components of VB.

Nalanda Open University
Annual Examination - 2016
Bachelor in Computer Application (BCA), Part-II
Paper-XIV (RDBMS Lab) CS-67P

Time: 3.00 Hrs.

Full Marks: 100(80+20)

Answer all questions. All questions carry equal marks.

1. A database system is to be designed to keep track of various bank accounts held by various customers. A customer can have many accounts; also one account may be held by more than one customer. Perform the following tasks:
 - (a) Design and implement normalized relations/tables. You must include primary key, validation checks and referential integrity constraints in relations/tables.
 - (b) Enter about 5-6 sets of meaningful data in each table.
 - (c) Design and implement the following queries/reports/forms for the database created by you:
 - (i) Create two forms — one for entering customer information and second for entering account related information.
 - (ii) Find the list of those customers, whose total assets are more than 10,000.
 - (iii) List all those accounts which are opened in the last one year.
 - (iv) List the Cust_ID, Cust_name, Account_No and Balance for all the accounts.
 - (v) Find the list of customers who have more than one account.
2. Define normalization? Explain the difference between BCNF and 4NF with an example.

SET - 2

Nalanda Open University
Annual Examination - 2016
Bachelor in Computer Application (BCA), Part-II
Paper-XIV (RDBMS Lab) CS-67P

Time: 3.00 Hrs.

Full Marks: 100(80+20)

Answer all questions. All questions carry equal marks.

1. A database system is to be designed to keep track of projects and employees working on projects. An employee can work on more than one project and one project may have many employees working on it. Perform the following tasks
 - (a) Design and implement normalized relations/tables for the E-R diagram. You should include primary key, validation checks and referential integrity constraints in your implementation.
 - (b) Enter about 5 — 6 sets of meaningful data in each table.
 - (c) Design and implement the following forms/queries/reports for the database system:
 - (i) Create two forms — one for employee data and one for project information.
 - (ii) List all the employees whose designation is "Software Engineer".
 - (iii) List the project details in decreasing order of project cost.
 - (iv) List Emp_ID, Emp_Name, Project_ID, and Project_Name for all the projects. You must use join operator to get this information.
 - (v) List the Emp_ID of those employees who are working on more than one project.
2. Define normalization? Explain the difference between 3NF and 4NF with an example.

Nalanda Open University
Annual Examination - 2016
Bachelor in Computer Application (BCA), Part-III
Paper-XV [Computer Networks (CS-68)]

Time: 3.00 Hrs.

Full Marks: 80

Answer any Five questions. All questions carry equal marks.

1. Compare and contrast between OSI model and TCP/IP model.
2. What are the devices used at datalink layer? Describe the functions of network layer.
3. Differentiate between broadband and baseband services. Write the protocols used at data link layer and network layer.
4. Explain the different types of transmission media with examples.
5. Which layer is responsible for congestion control and routing? How congestion can be controlled? Explain.
6. What are the functions of transport layer? Describe the protocols used at transport layer.
7. What is network security? Explain the methods used to make the network secure.
8. What is ISDN ? Describe ISDN BRI Services? Also discuss the advantages of using ISDN.
9. Differentiate between virtual circuit and datagrams. Explain the terms Bandwidth, Channel capacity, Multiplexing, Quality of Service (QoS), Full-Duplex Transmission
10. Describe all the fields of TCP header with diagram.



Nalanda Open University
Annual Examination - 2016
Bachelor in Computer Application (BCA), Part-III
Paper-XVI [TCP/IP PROGRAMMING (CS-69)]

Time: 3.00 Hrs.

Full Marks: 80

Answer any Five questions. All questions carry equal marks.

1. What are the situations in which host needs to know its protocol address (e.g. IP address) through its physical address. How is the IP header checksum calculated? Give an example.
2. Explain the meaning of IP Address. How many bits are used to represent the port address? Identify the class of following IP Addresses.
(i) 2.200.100.200 (ii) 130.120.180.200
(iii) 195.205.115.175 (iv) 205.100.50.20
3. What is the size of TCP header? Explain, how many packets are exchanged in termination of a TCP connection? Identify the header of each TCP flag. Also, explain its importance.
(i) URG (ii) RST (iii) SYN (iv) PSH
4. Differentiate between the following pairs:
(i) Gateways and Bridges
(ii) Transport layer of OSI and Transport layer of TCP/IP
(iii) Virtual Circuit and Datagram
5. What is the need to have database servers in DNS? What are the functions of the 'Name resolver' in DNS? Explain the meaning of following DNS addresses and their difference :
(i) http://www.nou.com (ii) www.nou.co.in
(iii) www.nou.org (iv) www.nou.ac.uk
6. A class B address is assigned the subnet mask of 255.255.240.0. How many hosts are possible per subnet? How many subnets are possible? Differentiate between connection-oriented and connectionless services with examples.
7. How many octets are there in Ethernet hardware address and IPv6 address? In cases where reliability is not of prime importance, UDP would make a good choice, Give examples in support of it.
8. Write short notes on:
(i) Error control mechanism at TCP layer
(ii) MIME
9. Explain the connection mechanism of File Transfer Protocol between Client and Server. What is meant by unicast, multicast and broadcast communication? Give an example for each.
10. Like IP address, all the hardware addresses are also unique throughout the network. Why is hardware address not used in place of IP address? Justify your answer. Write any three differences between Upward and downward multiplexing.



Nalanda Open University
Annual Examination - 2016
Bachelor in Computer Application (BCA), Part-III
Paper-XVII [INTRODUCTION TO SOFTWARE ENGINEERING (CS-70)]

Time: 3.00 Hrs.

Full Marks: 80

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

1. State and explain at least ten principles of Software Engineering.
2. A General Hospital consists of a number of specialized wards (Such as Maternity, Pediatric, and Oncology etc.). Each ward hosts a number of patients, who were admitted on the recommendation by their own specialist doctor and confirmed by a Senior Consultant employed by the Hospital. On admission, the personal details of every patient are recorded. A separate register is to be held to store information of the tests undertaken and the results of a prescribed treatment. A number of tests may be conducted for each patient. Each patient is assigned to one leading consultant but may be examined by another doctor, if required. Doctors are specialists in some branch of medicine and may be leading consultants for a number of patients, not necessarily from the same ward.
 - (a) Design the DFD's up to second level.
 - (b) Prepare SRS document. List assumptions, if any.
3. Who is a Systems Analyst? Elaborate on the technical and interpersonal skills required of a Systems Analyst. When is one skill favoured over the other?
4. State at least five risks in Software Engineering. How will you manage them? What are the ten causes of failure of CASE in some projects?
5. What is software maintenance? Describe briefly three types of maintenance. What is 4GL? Explain at least three areas which are impacted by the advent of 4GLs.
6. List at least five guidelines which will help prevent problems during Analysis and Design phases. What is benchmark testing? Why is it necessary?
7. What do you mean by Function Point Analysis? Mention its features. Describe COMOMO model briefly.
8. With the help of an example explain the prototyping model and spiral model.
9. Write short notes on:
 - (a) Software Reliability
 - (b) Regression testing
 - (c) Software quality.
10. What is Software testing? Explain why different types of testing required in a software? What is Software fault? Explain how faults are detected in a Software System?



Nalanda Open University

Annual Examination - 2016

Bachelor in Computer Application (BCA), Part-III

Paper-XVIII [Computer Oriented Numerical Techniques (CS-71)]

Time: 3.00 Hrs.

Full Marks: 80

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

1. (a) Give the floating point representation of the following numbers in 2 decimal digit and 4 decimal digit floating point number using (i) rounding (ii) chopping.

(i) 37.21829 (ii) 0.022718 (iii) 3000527.11059

(b) The quadratic Eqn. $x^4 - 4x^2 + 4 = 0$ has a double root starting with $x_0 = 1.5$. Compute two iteration by Newton Raphson method.

2. Solve the system of Equations by Gauss elimination :

$$x_1 - x_2 + 2x_3 - x_4 = -8$$

$$2x_1 - 2x_2 + 3x_3 - 3x_4 = -20$$

$$x_1 + x_2 + x_3 + 0x_4 = -2$$

$$x_1 - x_2 + 4x_3 + 3x_4 = 4$$

3. Solve the following system of equations by Gauss seidel Iteration method.

$$2x_1 + x_2 - 3x_3 + 9x_4 = 31$$

$$3x_1 - 4x_2 + 10x_3 + x_4 = 29$$

$$2x_1 + 12x_2 + x_3 - 4x_4 = 13$$

$$13x_1 + 5x_2 - 3x_3 + x_4 = 18$$

4. (a) If $f(1) = -3$, $f(3) = 9$, $f(4) = 30$ and $f(6) = 132$ find the Lagrange's Interpolation polynomial of $f(x)$. Also find the value of f when $x = 5$.

(b) If $f(x) = x^3$, find the value of $f[a, b, c]$

5. (a) Find the Newton's forward difference Interpolation Polynomial from the following table. Hence obtain the value of $f(x)$ at $x = 1.5$

x	1	2	3	4	5	6
$f(x)$	10	19	40	79	142	235

- (b) Find Newton's Backward difference form of Interpolating Polynomial for the data. Hence Interpolate $f(9)$

X	4	6	8	10
$f(x)$	19	40	79	142

6. (a) Find the first and second derivatives of $f(x)$ at $x = 1.1$ from the following tabulated value.

x	1.0	1.2	1.4	1.6	1.8	2.0
$f(x)$	0.000	0.1280	0.5440	1.2960	2.4320	4.000

- (b) Find $f'(x)$ at $x = 0.4$ from the following table of values :

x	0.1	0.2	0.3	0.4	0.5
$f(x)$	1.10517	1.22140	1.34986	1.49182	1.4256

7. (a) State and Prove Simpson's $\frac{1}{3}$ rd Rule.
- (b) Find the approximate value of $I = \int_0^1 \frac{dx}{1+x}$ using Trapezoidal Rule $n = 8$.
8. Using the fourth order Taylor's series method find the solution of the differential equation :
 $y' = x^2 + y^2$, $y(0) = 0.5$, find $y(0.4)$ taking $h = 0.2$
9. Solve the following IVPs using Euler's method $y' = \frac{1}{x^2 - 4y}$, $y(4) = 4$.
Find $y(4.1)$ taking $h = 0.1$.
10. Solve the following IVPs using R. K. fourth order method.
 $y' = 1 - 2ty$, $y(0.2) = 0.1948$. Find $y(0.4)$ taking $h = 0.2$.



1. What are objects? How do objects interact with each other and with the external interfaces? Describe with the help of a diagram.
2. Create a class student containing data members as Roll-no, Stu_name, Stu_address, Stu_class, Stu_dob, Stu_percentage. Include member functions to accomplish the following:
 - (i) Accept student details from the user.
 - (ii) Calculate the student age from his birth year.
 - (iii) Assign grade to the student as follows:

Grade percentage criteria

A - Percentage $\geq 90\%$

B $90 > \text{percentage} \geq 80\%$

C $80 > \text{percentage} \geq 70\%$

D $70 > \text{percentage} \geq 60\%$

E $\text{percentage} < 60$

Write appropriate main function for the above.

3. What is Inheritance? What are the different visibility modes observed while deriving a class from a base class. Write a program in C++ to implement multiple inheritance.
4. Write a program in C++ to overload the + operator to concatenate two strings.
5. What are virtual functions and pure virtual functions? Explain their utility with the help of an example.

1. Explain the differences between inline functions and macros in C++, giving examples of each.
2. What is object oriented programming? Explain any five characteristics of object oriented programming languages. Explain how objects are initialized. Give example using C++.
3. What is function overloading? How is it implemented? Write a program in C++ to overload the +, = operator to allow the following operation on strings. + = S2 where S2 is concatenated to S1 and the result is stored in S1.
4. What are friend functions? Explain with the help of an example by writing program in C++.
5. Write a program in C++ to explain this pointer.

Nalanda Open University
Annual Examination - 2016
Bachelor in Computer Application (BCA), Part-III
Paper-XX [Theory of Computer Science (CS-73)]

Time: 3.00 Hrs.

Full Marks: 80

Answer any Five questions. All questions carry equal marks.

1. Define finite automata. Explain Mealy and Moore machine with an example.
2. Define regular expression. What are the rules of writing the regular expression? Write regular expressions for the following:
 - (i) A language over the alphabet {a, b} of strings of odd length.
 - (ii) A language over the alphabet {0, 1}, of strings which have '01' at the end of each string.
3. Define Grammar and explain Chomsky's classification of grammar with examples.
4. State and prove the Pumping lemma for regular expressions.
5. Consider the following productions:
 $S \rightarrow aB/bA$
 $A \rightarrow aS/bAA/a$
 $B \rightarrow bS/aBB/b$
For the string aabbbaabba, find the left most derivation and draw the Parse tree for the same.
6. Determine the Closure property of CFLs under the following set operations:
 - (i) Union
 - (ii) Kleene star
 - (iii) Complementation
7. Build a Push Down Automata (PDA) that accepts the language of odd palindrome over the alphabet {0, 1}. Give the computation sequence for the input 0110110 accepted by a PDA.
8. Find the equivalent finite automata for the following regular expressions:
 - (i) $(a + b)^* (ab + ba) (a + b)^*$.
 - (ii) $(01+10+11)$
 - (iii) 010^*10^*1
 - (iv) $a(a+b)^*bb$
9. Construct a Turing machine to accept the product function given by:
 $F(m,n) = \{0, \text{ if } m=0 \text{ or } n=0, \text{ Else } mxn\}$
10. State any three undecidable problems. Prove that $L = \{a^n b^m a^n b^m \mid n, m \geq 1\}$ is not context free.

Nalanda Open University
Annual Examination - 2016
Bachelor in Computer Application (BCA), Part-III
Paper-XXI [Introduction to Internet Programming (CS-74)]

Time: 3.00 Hrs.

Full Marks: 80

Answer any Five questions. All questions carry equal marks.

1. What is object oriented programming? Explain the concept of reusability by creating an Account class and deriving Saving_Account and Current_Account classes from it. Use appropriate access specifiers, data members and member functions in your explanation.
2. What is interface in Java? Explain need of interface with the help of an example. What is a stream? Explain difference between Byte Stream and Character Stream.
3. What is multithreading? Explain different states of a thread. Write a Java program using multithreading to create two threads which display numbers 1 - 10.
4. Define a constructor. Is it possible, to overload a constructor? Justify your answer using an example.
5. What is super key word in Java? Explain with example. Differentiate between overloading and overriding with the help of suitable example.
6. Write a Java program to count the number of words and lines in a file. The program should take the name of the file at command line. What is exception? Explain with an example, how Java handle Arithmetic- Exceptions.
7. Write a Java applet to take your name, address, contact number as input and display it in 'blue color'. What is string class? How it is different from StringBuffer Class?
8. Explain the following with respect to Java programming with the help of an example.
 - (a) Abstract Class
 - (b) Finally
 - (c) Package
 - (d) Layout Manager
 - (e) JVM
9. Write a program in Java to perform the addition of two complex numbers. Static function can operate only on static data. Explain.
10. Explain what happens if private is applied to a method in a class. Give an example. Describe the accessibility of protected and public members within a package, subclass and globally.



Nalanda Open University
Annual Examination - 2016
Bachelor in Computer Application (BCA), Part-III
Paper-XXII [Intranet Administration (CS-75)]

Time: 3.00 Hrs.

Full Marks: 80

Answer any Five questions. All questions carry equal marks.

1. On what basis does any organisation decides to set up an Intranet? What are the most frequently asked questions about Intranet? How will you protect your Intranet from being accessed by unauthorized external people?
2. What are different browsers available in the market? How do you select one of them for your organisation? What are different Pentium based Webserver systems available? Write a short note on each of them.
3. What is the process of Designing Intranet? How will you calculate the cost of setting up an Intranet? Explain with an example .
4. What are the various internal issue that have to be addressed while creating an Intranet business plan? Explain them.
5. Write a short note on the following:
 - (a) Servers and Security
 - (b) IP Addressing
 - (c) Daemon
6. Explain the architecture of SMLI (Stateful Multi-Layer Inspection) firewall with the help of a diagram. How does a firewall work in an intranet to maintain security?
7. What is GroupWare? List any five broad range of applications associated with them. Explain the address resolution mechanism in a DNS Server. Why do we need a Secondary DNS Server in an Internet?
8. Explain the working principle of WAP. Give any three applications of WAP. What are the different E-commerce protocols? How do they help in business development in internet?
9. What is GPRS? Give any two distinct applications of GPRS. Name any four Editors that can be used for Web authoring. Explain any six features which are desirable in an Editor.
10. Write short notes on the following :
 - (a) POP
 - (b) CGI
 - (c) SOCKS
 - (d) ODBC