उत्तर प्रदेश राजर्षि टण्डन मुक्त विश्वविद्यालय, प्रयागराज

Bachelor of Computer Application कार्यक्रम अधिन्यास सत्र **2019—20**

कोर्स कोड : Course Code: **BCA-1.1**	कोर्स शीर्षकः— (Course Title) **Computer Fundamental and PC Software**	अधिकतम अंक : 30 **Maximum Marks : 30**

खण्ड अ अधिकतम अंक : 18

Section-A   **Maximum Marks: 18**

नोट—(Instructions): Section A consists of long answer questions from 1 to 3. Answer should be in 800 to 1000 words.

1. Explain the differences between followings:
   (i) Compiler and interpreter
   (ii)Spooling and buffering
   (iii) Message switching and Circuit switching.
2. Write a step-by-step procedure to do the following activities in windows-95.
   (i) Add/Remove application (ii) Controlling access to files, folders. (iii) To record, play and edit sound files.
3. Write four differences each of the following.
   (i) Router and Gateway (ii) Ring Topology and Star Topology.

खण्ड ब अधिकतम अंक : 12

Section –B   **Maximum Mark : 12**

नोट—(Instructions): Section B consists of short answer questions from 4 to 7. Answer should be in 200 to 300 words.

4. Explain the terms: Serial Processing, Batch Processing and Multiprogramming
5. Explain the steps to perform 'Find and Replace' in MS Word.
6. What is a computer virus? Explain different types of computer viruses?
7. Explain the memory hierarchy. Give characteristics of group of memory at each level.

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कोर्स कोड : Course Code: **BCA-1.2**	कोर्स शीर्षकः– (Course Title) **'C' Programming and Data Structures**	अधिकतम अंक : 30 **Maximum Marks : 30**

खण्ड अ   अधिकतम अंक : **18**

Section-A   **Maximum Marks: 18**

नोट–(Instructions): Section A consists of long answer questions from 1 to 3. Answer should be in 800 to 1000 words.

1. (a) Discuss about arithmetic operators and relational operators.
   (b) Differentiate between break and continue statements in C language with example.
2. Define AVL tree. Is the statement "Every Binary Tree is an AVL tree" correct? Justify your answer.
3. Discuss the applications of searching techniques. Write a program in C to implement a linear search and binary search.

खण्ड ब   अधिकतम अंक : **12**

Section –B   **Maximum Mark : 12**

नोट–(Instructions): Section B consists of short answer questions from 4 to 7. Answer should be in 200 to 300 words. Attempt <u>any four questions</u> from this section.

4. Write any five advantages of Pointers over Arrays.
5. Define "Binary Tree". How does a Binary Tree differ from a Tree?
6. Define "Graph". When can it be said that two vertices of a Graph are connected?
7. Write a program to find maximum and minimum elements of an array of size N.

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कोर्स कोड : Course Code: BCA-1.3	कोर्स शीर्षकः– (Course Title) **Basic Mathematics**	अधिकतम अंक : 30 **Maximum Marks : 30**

खण्ड अ   अधिकतम अंक : 18

Section-A   **Maximum Marks: 18**

नोट–(Instructions): Section A consists of long answer questions from 1 to 3. Answer should be in 800 to 1000 words.

1. a) Integrate $\int cos(x)^5 sin(x)^7 \, dx$
   b) Show that Every differentiable function is continuous but converse is not true.
2. a) Prove that $A \cap (B \cup C) = (A \cap B) \cup (A \cup C)$.
   where A, B, C are non-empty sets.
   b) Find the Value of x: $(x^2 + 2x + 3)^{1/2} = (2x + 5)$
3. Evaluate
   a) $\int \frac{tan(x)}{Sec(x)+tan(x)} dx$
   b) $lim_{x \to 0} tan(x)^{1/x^2}$

खण्ड ब   अधिकतम अंक : 12

Section –B   **Maximum Mark : 12**

नोट–(Instructions): Section B consists of short answer questions from 4 to 7. Answer should be in 200 to 300 words.

4. Find the area bounded by the curve y=√x and y=x.
5. Evaluate $lim_{x \to 0} \sqrt{(1 + x)} - 1$
6. If α and β are roots of $ax^2 + bx + c = 0$ then find $\alpha^3 + \beta^3$.
7. Integrate $\int \frac{dx}{1+sinx}$

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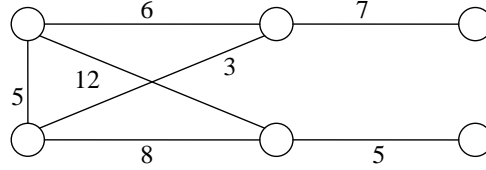| कोर्स कोड : Course Code:**BCA-E1**	कोर्स शीर्षकः– (Course Title) **Design and Analysis Of Algorithms**	अधिकतम अंक : 30 **Maximum Marks : 30**

खण्ड अ अधिकतम अंक : **18**

Section-A **Maximum Marks: 18**

नोट–(Instructions): Section A consists of long answer questions from 1 to 3. Answer should be in 800 to 1000 words.

1. Show the results of inserting the keys: F, S, Q, K, C, L, H, T, V, W, M, R and N in order to an empty B-Tree with minimum degree 2.
2. Solve the recurrence relation by iteration
   $$T(n) = T(n-1) + n^4$$
3. Find the minimum spanning tree using Prims algorithm for the following graph.

खण्ड ब अधिकतम अंक : **12**

Section –B **Maximum Mark : 12**

नोट–(Instructions): Section B consists of short answer questions from 4 to 7. Answer should be in 200 to 300 words.

4. Solve the following recurrence. :
   $$T(1) = 1$$
   $$T(n) = 4T\ (n/3) + n^2 \text{ for } x <= 2$$
5. Show the trace of heapsort algorithm for following input data :
   30, 50, -100, 200, 50, 30, 60, 80, 200 in order.
6. Give an algorithm for Strassens's multiplication. Explain how a divide and conquer strategy is applicable to it? Also analyze your algorithm.
7. Find the optimal solution using greedy criterion for a knapsack having capacity 50 kg. The list of items having values and weight as are shown in the table:

Item	I_1	I_2	I_3	I_4	I_5
Profit	10	20	24	9	8
weight	8	14	34	5	4

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कोर्स कोड : Course Code: **BCA-E2**	कोर्स शीर्षकः– (Course Title) **Theory of COmputation**	अधिकतम अंक : 30 **Maximum Marks : 30**

खण्ड अ अधिकतम अंक : 18

Section-A **Maximum Marks: 18**

नोट–(Instructions): Section A consists of long answer questions from 1 to 3. Answer should be in 800 to 1000 words.

1. Construct a NFA for language L = (a + b)b(a + bb) .
2. Write short notes on: (i) Chomsky classification of Languages (ii) Pushdown Automata. (iii) Turing Machine.
3. Show that the given grammar is ambiguous.
   S → a / abSb / aAb
   A → bs / aAAb

खण्ड ब अधिकतम अंक : 12

Section –B **Maximum Mark : 12**

नोट–(Instructions): Section B consists of short answer questions from 4 to 7. Answer should be in 200 to 300 words.

4. What do you understand by pumping lemma for regular grammar?
5. What do you understand by undecidable problems? State the Halting problem and prove that halting problem is undecidable.
6. Draw finite automat recognizing following language. 1 (1 + 10)* + 10(0+01)* 14.
7. What is the difference between DFA and NFA?

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कोर्स कोड : Course Code: **BCA-1.5**	कोर्स शीर्षकः– (Course Title) **DBMS**	अधिकतम अंक : 30 **Maximum Marks : 30**

खण्ड अ   अधिकतम अंक : 18

Section-A   **Maximum Marks: 18**

नोट–(Instructions): Section A consists of long answer questions from 1 to 3. Answer should be in 800 to 1000 words.

1. Construct an E-R diagram for a hospital with a set of patients and a set of medical doctors. Associate with each patient a log of the various tests and examinations conducted.
   (i) Draw an E-R diagram
   (ii) Transform the E-R diagram to a Relational Schema.
2. What is index file? What are the differences between primary index and secondary index? Discuss in detail on B+ tree and B tree index file.
3. Consider the following relational schema:

   Suppliers(sid:integer, sname:string, city:string, street:string)

   Parts(pid:integer, pname:string, color:string)

   Catalog(sid:integer, pid:integer, cost:real)

   The highest normal form of this relation scheme is? Justify your answer

खण्ड ब   अधिकतम अंक : 12

Section –B   **Maximum Mark : 12**

नोट–(Instructions): Section B consists of short answer questions from 4 to 7. Answer should be in 200 to 300 words.

4. Given the following set F of functional dependencies for relation schema R = {A, B, C, D, E}. {A -> BC, CD -> E, B -> D, E -> A} List the candidate keys for R.
5. What is data? What do you mean by information? What are the differences between data and information?
6. Explain 1NF, 2NF and 3NF with an example.
7. Discuss the advantages of DBMS over traditional file processing system.

कोर्स कोड : Course Code: **BCA-1.6**	कोर्स शीर्षकः– (Course Title) **RDBMS**	अधिकतम अंक : 30 **Maximum Marks : 30**

खण्ड अ अधिकतम अंक : 18

Section-A **Maximum Marks: 18**

नोट–(Instructions): Section A consists of long answer questions from 1 to 3. Answer should be in 800 to 1000 words.

1. a) Write a query in sql to create a table client master with the following fields client_no, name, address, city, state, pin_code, balance due.

    b) Add the following constraints on column of client master?
    • Create a primary key constraint on the column client_no.?
    • create the following check constraints
       Data values being inserted into the column client_no must start with 'c'.
       Data values being inserted into the column name balance due should be greater than 0?

    c) Add a new column in your table: AGE?

    d) Delete a row from client master where age is greater then 60?

2. Construct an E-R diagram for a hospital with a set of patients and a set of medical doctors. Associate with each patient a log of the various tests and examinations conducted.
    (i) Draw an E-R diagram
    (ii) Transform the E-R diagram to a Relational Schema.

3. Consider the following relational schema:

    Suppliers(sid:integer, sname:string, city:string, street:string)

    Parts(pid:integer, pname:string, color:string)

    Catalog(sid:integer, pid:integer, cost:real)

    The highest normal form of this relation scheme is? Justify your answer

खण्ड ब अधिकतम अंक : 12

Section –B **Maximum Mark : 12**

नोट–(Instructions): Section B consists of short answer questions from 4 to 7. Answer should be in 200 to 300 words.

4. Identify the Normal Forms of the relation R(ABCDEF) Functional dependencies given by {AB → C, C → D, B → E, B → F}

5. Let R(ABCDEF) is a relational schema having FDs {A→BCDEF, BC→ADEF, B→C, D→E} Find out the Candidate Key ?

6. Write a query in sql for the following database:
Employee(empno,ename,deptno,job,hiredate)

a) Create a table employee and make the empno as primary key of the table.

b) Give list of employee name & their job spec who are working in deptno 20?

7. What is normalization and why do we use it?

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कोर्स कोड : Course Code: **BCA-1.7**	कोर्स शीर्षकः— (Course Title) **Basic Electronics**	अधिकतम अंक : 30 **Maximum Marks : 30**

खण्ड अ   अधिकतम अंक : 18

Section-A   **Maximum Marks: 18**

नोट—**(Instructions): Section A consists of long answer questions from 1 to 3. Answer should be in 800 to 1000 words.**

1. What is Modulation? Why is modulation necessary in communication system?
2. Draw the circuit of Bridge rectifier and explain the working of it. Give its merits and demerits.
3. Draw the basic circuit for obtaining the static V-I characteristics of thyristor.

खण्ड ब   अधिकतम अंक : 12

Section –B   **Maximum Mark : 12**

नोट—**(Instructions): Section B consists of short answer questions from 4 to 7. Answer should be in 200 to 300 words.**

प्रश्न संख्या 10से 21 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 200 से 300 शब्दों में लिखना है।

4. Explain the difference between Zener and avalanche breakdown.
5. Explain universal logic gates? How they can be converted into each other?
6. Explain CB, CE and CC configuration in detail.
7. Draw and explain the working of emitter follower.

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कोर्स कोड : Course Code: **BCA-E3**	कोर्स शीर्षकः– (Course Title) **Data Mining**	अधिकतम अंक : 30 **Maximum Marks : 30**

खण्ड अ अधिकतम अंक : 18

Section-A **Maximum Marks: 18**

नोट–(Instructions): Section A consists of long answer questions from 1 to 3. Answer should be in 800 to 1000 words.

1. Explain structure of the data warehouse? Discuss in detail all the steps involve in making a data ware house.
2. Explain the different partitioning hierarchical clustering methods in details.
3. Differentiate between following:
   a) Database b) Data Warehouse c) Data Mining d) KDD

खण्ड ब अधिकतम अंक : 12

Section –B **Maximum Mark : 12**

नोट–(Instructions): Section B consists of short answer questions from 4 to 7. Answer should be in 200 to 300 words.

4. Explain various data reduction techniques.
5. What are the various types of metadata? Explain in detail?
6. What is Classification? What do you mean by data cleaning?
7. How does data warehouse handle multidimensional data?

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कोर्स कोड : Course Code: **BCA-E4**	कोर्स शीर्षकः– (Course Title) **E-Commerce**	अधिकतम अंक : 30 **Maximum Marks : 30**

खण्ड अ   अधिकतम अंक : 18

Section-A   **Maximum Marks: 18**

नोट—(Instructions): Section A consists of long answer questions from 1 to 3. Answer should be in 800 to 1000 words.

1. What do we mean by Electronic Data Interchange? Explain the architecture of EDI with the help of a diagram.
2. Explain the benefits of e-commerce to organizations, customers and society at large.
3. Explain how smart cards and credit cards have roles in e commerce applications.

खण्ड ब   अधिकतम अंक : 12

Section –B   **Maximum Mark : 12**

नोट—(Instructions): Section B consists of short answer questions from 4 to 7. Answer should be in 200 to 300 words.

इस खंड से किसी भी चार प्रश्नों के उत्तर दें।

4. Briefly describe the following:
   a. Firewalls
   b. Domain Name System
5. What do we mean by Electronic Fund Transfer? What are the different ways in which fund transfer can be done electronically?
6. What is a Cyber Crime?
7. How risk is handled in e-Payment system?

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कोर्स कोड :	कोर्स शीर्षकः– (Course Title)	अधिकतम अंक : 30
Course Code:**BCA-1.9**	**C++ and Object oriented programming**	**Maximum Marks : 30**

खण्ड अ   अधिकतम अंक : 18

Section-A   **Maximum Marks: 18**

नोट–(Instructions): Section A consists of long answer questions from 1 to 3. Answer should be in 800 to 1000 words.

1. Explain why do we need to use constructors? Explain a copy constructor with an example.

2. What is polymorphism? What are different forms of polymorphism? Explain implementation of polymorphism with the help of a C++ program.

3. Declare an abstract class *"Shape"* with methods **'area'** &**'volume'**. Refine this super class to subclasses like *"cone"*, *"cylinder"* &*"Rectangular Box.* Then, Calculate area and volume for the subclasses.

खण्ड ब   अधिकतम अंक : 12

Section –B   **Maximum Mark : 12**

नोट–(Instructions): Section B consists of short answer questions from 4 to 7. Answer should be in 200 to 300 words.

खण्ड ब में 10 से 21 तक लघु उत्तरीय प्रश्न है जिनका उत्तर 200 से 300 शब्दों में लिखना है। इस खंड से किसी भी चार प्रश्नों के उत्तर दें।

4. What do you mean by "this" function? What are the applications of "this" pointer?

5. What is reusability? Which things can be reused?

6. What is friend function? How it is implemented in C++?

7. List the features of Object oriented programming.

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कोर्स कोड : Course Code: **BCA-1.10**	कोर्स शीर्षकः– (Course Title) **Multimedia**	अधिकतम अंक : 30 **Maximum Marks : 30**

खण्ड अ   अधिकतम अंक : 18

Section-A   **Maximum Marks: 18**

नोट–(Instructions): Section A consists of long answer questions from 1 to 3. Answer should be in 800 to 1000 words.

1. List the hardware and software components essential for professional multimedia development. Also, justify purpose and need of each of the hardware components.
2. What is the method of storing image in vector format? Explain its advantages.
3. What are the authoring tools? List out some silent features of a good authoring tool.

खण्ड ब   अधिकतम अंक : 12

Section –B   **Maximum Mark : 12**

नोट–(Instructions): Section B consists of short answer questions from 4 to 7. Answer should be in 200 to 300 words.

प्रश्न संख्या 10 से 21 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 200 से 300 शब्दों में लिखना है। इस खंड से किसी भी चार प्रश्नों के उत्तर दें।

11. Explain the following terms:
    a) Hypertext?
    b) Morphing?
12. What are the differences between icon based and event based authoring tools?
13. What are the differences between the GIF and JPEG?
14. Define the term parallel projection. Categorize various types of parallel projection.

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कोर्स कोड : Course Code: **BCA-1.11**	कोर्स शीर्षकः– (Course Title) **System Analysis and Design**	अधिकतम अंक : 30 **Maximum Marks : 30**

खण्ड अ   अधिकतम अंक : 18

Section-A   **Maximum Marks: 18**

नोट–(Instructions): Section A consists of long answer questions from 1 to 3. Answer should be in 800 to 1000 words.

1. Explain prototype model of software development. Is prototype model a suitable Model for courier company management system? Justify your answer.
2. Explain the following:
   a) Project b) Project scheduling c) Critical Path d) Milestones e) Checkpoints f) Project review.
3. With respect to purchasing and inventory control systems explain any three of the following:
   a) Why do retail outlets carry inventory b) Inventory carrying cost. c) Procurement lead time d) Bill of material.

खण्ड ब   अधिकतम अंक : 12

Section –B   **Maximum Mark : 12**

नोट–(Instructions): Section B consists of short answer questions from 4 to 7. Answer should be in 200 to 300 words.

10. What are the differences between Black Box Testing" and "White Box Testing"?
11. Discuss the role of PERT Chart in software development.
12. What is coupling and Cohesion? What are the different type of Cohesion?
13. What is spiral model?

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कोर्स कोड : Course Code: **BCA-E5**	कोर्स शीर्षकः– (Course Title) **Object Oriented Analysis and Design**	अधिकतम अंक : 30 **Maximum Marks : 30**

खण्ड अ   अधिकतम अंक : 18

Section-A   **Maximum Marks: 18**

नोट–(Instructions): Section A consists of long answer questions from 1 to 3. Answer should be in 800 to 1000 words.

1. What is the relationship between cohesion and coupling? Identify the type of coupling in the following. How can it overcome?

2. Explain Aggregation & Generalization in detail with suitable example.

3. Describe how class diagram, object diagram and generalization are represented with UML Diagram.

खण्ड ब   अधिकतम अंक : 12

Section –B   **Maximum Mark : 12**

नोट–(Instructions): Section B consists of short answer questions from 4 to 7. Answer should be in 200 to 300 words.

4. Describe the activities involved in an ATM transaction.

5. What are the shortcomings in structured approach? Why generally, does an object granted system use a relational DBMS?

6. Explain the steps for converting state diagram to code.

7. Differentiate between Class diagram & Instance diagram

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कोर्स कोड : Course Code:**BCA-E6**	कोर्स शीर्षकः– (Course Title) **Java Programming**	अधिकतम अंक : 30 **Maximum Marks : 30**

खण्ड अ   अधिकतम अंक : 18

Section-A   **Maximum Marks: 18**

नोट–(Instructions): Section A consists of long answer questions from 1 to 3. Answer should be in 800 to 1000 words.

1. What is a constructor? Write a Java program to explain how super class constructors are called in their subclasses.
2. What is Object Oriented Paradigm? Explain features of Object Oriented Paradigm. Why Object Oriented Programming are preferred over structured programming?
3. What is package in Java? Explain how to decide the need of package(s) in a system which is to be developed using Java.

खण्ड ब   अधिकतम अंक : 12

Section –B   **Maximum Mark : 12**

नोट–(Instructions): Section B consists of short answer questions from 4 to 7. Answer should be in 200 to 300 words.

4. What is the difference between Overloading and Overriding? Is it possible to override an inner classes?
5. How encapsulation does is achieved in java?
6. What is static method? Explain why main method in Java is always static.
7. What is an instance variable? Explain how an instance variable of a class can have different value for each object of that class.

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Bachelor of Computer Applications (BCA) कार्यक्रम अधिन्यास सत्र 2019–20

कोर्स कोड : Course Code: B**CA-1.13**	कोर्स शीर्षकः– (Course Title) Computer Network	अधिकतम अंक : 30 **Maximum Marks : 30**

खण्ड अ   अधिकतम अंक : 18

Section-A   **Maximum Marks: 18**

नोट–(Instructions): Section A consists of long answer questions from 1 to 3. Answer should be in 800 to 1000 words.

1. Differentiate between OSI and TCP reference model in terms of layers. Functionality of each layer and important protocols at each layer.
2. Assume message M: 1010101010 bits and generator G: 10001 bits. Explain how CRC is used for error detection using above message bits and generator bits.
3. Explain the working of Link State Routing Algorithm using an example.

खण्ड ब   अधिकतम अंक : 12

Section –B   **Maximum Mark : 12**

नोट–(Instructions): Section B consists of short answer questions from 4 to 7. Answer should be in 200 to 300 words.

4. Explain the working of Distance Vector Routing using an example.
5. Differentiate between mutlicast addressing and Unicast addressing.
6. What do we mean by class addressing and class-less addressing? Give the range of IP addresses used in different classes in class addressing mode.
7. Write short notes on the following:
   a. Hub   b. Repeater

कोर्स कोड : Course Code: **BCA-1.14**	कोर्स शीर्षकः– (Course Title) **Operating Systems**	अधिकतम अंक : 30 **Maximum Marks : 30**

खण्ड अ   अधिकतम अंक : 18

Section-A   **Maximum Marks: 18**

नोट–(Instructions): Section A consists of long answer questions from 1 to 3. Answer should be in 800 to 1000 words.

1. Why there is need of process synchronization? Explain how semaphores can be used to deal with n-process critical section problem.
2. Consider the following table of arrival time and burst time for three processes P0, P1 and P2.

Process	Arrival time	Burst Time
P0	0 ms	9 ms
P1	1 ms	4 ms
P2	2 ms	9 ms

The pre-emptive shortest job first scheduling algorithm is used. Scheduling is carried out only at arrival or completion of processes. What is the average waiting time for the three processes?

3. Discuss how scheduling algorithms are selected for a system. What are the criteria considered?

खण्ड ब   अधिकतम अंक : 12

Section –B   **Maximum Mark : 12**

नोट–(Instructions): Section B consists of short answer questions from 4 to 7. Answer should be in 200 to 300 words.

4. What is a TLB? How does it improve effective access time of data?
5. What is the purpose of swap space?
6. What is purpose of Process Control Block?
7. What are the minimum requirements that should be satisfied by a solution to critical section problem?

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कोर्स कोड : Course Code: **BCA-1.15**	कोर्स शीर्षकः– (Course Title) **Windows Programming**	अधिकतम अंक : 30 **Maximum Marks : 30**

खण्ड अ   अधिकतम अंक : 18

Section-A   **Maximum Marks: 18**

नोट–(Instructions): Section A consists of long answer questions from 1 to 3. Answer should be in 800 to 1000 words.

1. Write a program in VB for adding List Box, List Items, Check Box, Radio Button and Menus to your Window.
2. What are the advantages and disadvantages of VB over any other object-oriented language? Explain with suitable examples.
3. Discuss various control structures in Visual Basic?

खण्ड ब   अधिकतम अंक : 12

Section –B   **Maximum Mark : 12**

नोट–(Instructions): Section B consists of short answer questions from 4 to 7. Answer should be in 200 to 300 words.

4. What are the usage of Msgbox() and InputBox()?
5. Explain OLEDB and IDE (Integrated Development Environment) Components?
6. Explain the uses of List box controls and combobox controls.
7. What are the basic differences between checkbox and radio buttons?

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कोर्स कोड : Course Code: **BCA-E7**	कोर्स शीर्षकः– (Course Title) **Network Programming**	अधिकतम अंक : 30 **Maximum Marks : 30**

खण्ड अ   अधिकतम अंक : **18**

Section-A   **Maximum Marks: 18**

नोट–(Instructions): Section A consists of long answer questions from 1 to 3. Answer should be in 800 to 1000 words.

1. Define process identifier. Explain the operation of 'fork' function. List the similarities and differences between parent and child process.
2. Explain the following with syntax
   a. kill() and raise() functions
   b. alarm() and pause() functions
   c. Pipes in UNIX
3. Explain the following with necessary diagram
   i. I/O Multiplexing
   ii. Signal driven I/O
   iii. Asynchronous I/O

खण्ड ब   अधिकतम अंक : **12**

Section –B   **Maximum Mark : 12**

नोट–(Instructions): Section B consists of short answer questions from 4 to 7. Answer should be in 200 to 300 words.

4. State the difference between fork( ) and exec( ) functions
5. How is a system call different from Library function?
6. What is a socket in TCP communication? Give the IPv4 internet socket address structure.
7. List out the entities that are shared by all threads within a process.

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कोर्स कोड : Course Code:**BCA-E8**	कोर्स शीर्षकः– (Course Title) **Mobile Computing**	अधिकतम अंक : 30 **Maximum Marks : 30**

खण्ड अ   अधिकतम अंक : 18

Section-A   **Maximum Marks: 18**

नोट–(Instructions): Section A consists of long answer questions from 1 to 3. Answer should be in 800 to 1000 words.

1. What is mobile computing? Draw architecture of mobile computing with various applications of mobile computing.
2. Explain the concept of IP packet delivery in a mobile system.
3. Explain the Dynamic Source Routing in Ad-hoc network with an example.

खण्ड ब   अधिकतम अंक : 12

Section –B   **Maximum Mark : 12**

नोट–(Instructions): Section B consists of short answer questions from 4 to 7. Answer should be in 200 to 300 words.

4. Explain about the selective retransmission.
5. How does CSMA minimize fading?
6. Is directional antenna useful for mobile phones? Why?
7. Explain the concept behind the Wireless Transaction Protocol.

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कोर्स कोड : Course Code: **BCA-1.17**	कोर्स शीर्षकः– (Course Title) **Software Engineering**	अधिकतम अंक : 30 **Maximum Marks : 30**

खण्ड अ   अधिकतम अंक : 18

Section-A   **Maximum Marks: 18**

नोट–(Instructions): Section A consists of long answer questions from 1 to 3. Answer should be in 800 to 1000 words.

1. What is Risk Management and what will risk management do for any business? How does software risk management related to Software process improvement?
2. What is Software Testing? What are the various characteristics of a good testable software?
3. What is function point analysis? List four features of it.

खण्ड ब   अधिकतम अंक : 12

Section –B   **Maximum Mark : 12**

नोट–(Instructions): Section B consists of short answer questions from 4 to 7. Answer should be in 200 to 300 words.

4. How does the "Black Box Testing" differs from "White Box Testing"?
5. What do you mean by Software Configuration Management?
6. Discuss the role of PERT Chart in software development.
7. What is (SQA)? What are the component of Software Quality Assurance (SQA)?

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कोर्स कोड : Course Code:**BCA-1.18**	कोर्स शीर्षकः– (Course Title) **System Software**	अधिकतम अंक : 30 **Maximum Marks : 30**

खण्ड अ अधिकतम अंक : 18
Section-A **Maximum Marks: 18**

नोट–(Instructions): Section A consists of long answer questions from 1 to 3. Answer should be in 800 to 1000 words.

1. Define the following terms :
   a. Dispatchers
   b. Scheduling
   c. Swapping
   d. Context switching

2. Explain the following Unix commands:
   (a) cp (b) chmod (c) sort (d) vi (e) ls (f) tee

3. What is a Semaphore? Explain the wait and signal operations of a semaphore. Why are these operations atomic?

खण्ड ब अधिकतम अंक : 12

Section –B **Maximum Mark : 12**

नोट–(Instructions): Section B consists of short answer questions from 4 to 7. Answer should be in 200 to 300 words.

4. Discuss the paging system for memory management; also give its advantages and disadvantages.
5. Differentiate between :
   (a) System software and application software
   (b) General purpose OS and real time OS
6. Write the merits and demerits of Assembly language and High level language.
7. Explain the difference between compiler and Interpreter. Write the names of two languages used in compiler and interpreter.

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कोर्स कोड : Course Code: **BCA-1.19**	कोर्स शीर्षकः— (Course Title) **Computer Graphics**	अधिकतम अंक : 30 **Maximum Marks : 30**

खण्ड अ   अधिकतम अंक : 18
Section-A   **Maximum Marks: 18**

नोट—(Instructions): Section A consists of long answer questions from 1 to 3. Answer should be in 800 to 1000 words.

1. List the hardware and software components essential for professional multimedia development. Also, justify the need of each of the hardware components.
2. Describe the matrix formulation of 2D Translation, Scaling and Rotation.
3. Define following terms:
   a) Refresh buffer/frame buffer.
   b) Pixel?
   c) Aspect ratio.

खण्ड ब   अधिकतम अंक : 12
Section –B   **Maximum Mark : 12**

नोट—(Instructions): Section B consists of short answer questions from 4 to 7. Answer should be in 200 to 300 words.

4. Explain the various digital movie tools.
5. Write short note on:
   (a) MPEG
   (b) MP3
6. What are the differences between the GIF and JPEG?
7. Explain Bresenham's circle generating algorithm.

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कोर्स कोड : Course Code: **BCA-E9**	कोर्स शीर्षकः— (Course Title) **Web Technology**	अधिकतम अंक : 30 **Maximum Marks : 30**

खण्ड अ अधिकतम अंक : 18

Section-A **Maximum Marks: 18**

नोट—(Instructions): Section A consists of long answer questions from 1 to 3. Answer should be in 800 to 1000 words.

1. Explain the servlet API life cycle methods in brief.
2. Discuss the basic differences between Servlet and JSP.
3. Explain in detail the creation, instantiation and usage of java beans objects.

खण्ड ब अधिकतम अंक : 12

Section –B **Maximum Mark : 12**

नोट—(Instructions): Section B consists of short answer questions from 4 to 7. Answer should be in 200 to 300 words.

4. Explain the way in which a DNS server resolves addresses.
5. Give some advantages of using cascading style sheets.
6. Compare DOM and SAX in XML processing.
7. Write a CSS which adds background images and indentation?

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कोर्स कोड : Course Code: **BCA-E10**	कोर्स शीर्षकः– (Course Title) **Client Server Technology**	अधिकतम अंक : 30 **Maximum Marks : 30**

खण्ड अ   अधिकतम अंक : 18

Section-A   **Maximum Marks: 18**

नोट—(Instructions): Section A consists of long answer questions from 1 to 3. Answer should be in 800 to 1000 words.

1. Draw the block diagram of client/server architecture and explain the advantages of client/server computing with the help of suitable example.
2. Explain about network management and remote system management. How can security be provided to network?
3. Explain Connectivity and Communication Interface Technology in client/server application. How does transmission protocol work in client/server application?

खण्ड ब   अधिकतम अंक : 12

Section –B   **Maximum Mark : 12**

नोट—(Instructions): Section B consists of short answer questions from 4 to 7. Answer should be in 200 to 300 words.

4. Why OLE is needed? Explain its importance.
5. Why Network Management is needed? Explain.
6. Differentiate between stateful and stateless servers.
7. Explain asynchronous Transfer mode (ATM) in detail.

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कोर्स कोड : Course Code: **BCA-1.21**	कोर्स शीर्षकः– (Course Title) **Principle of Programming Language**	अधिकतम अंक : 30 **Maximum Marks : 30**

खण्ड अ   अधिकतम अंक : **18**
Section-A   **Maximum Marks: 18**

नोट–(Instructions): Section A consists of long answer questions from 1 to 3. Answer should be in 800 to 1000 words.

1. (a) Discuss features of programming language and its importance.
   (b) Draw the syntax tree for $a+b*c/d + e-f$.
2. Write short notes on:
   (a) Pointers
   (b) Polymorphism.
3. Write any four important uses of programming languages. List the design principles of imperative languages.

खण्ड ब   अधिकतम अंक : **12**
Section –B   **Maximum Mark : 12**

नोट–(Instructions): Section B consists of short answer questions from 4 to 7. Answer should be in 200 to 300 words.

4. Distinguish between dangling pointers and memory leakage.
5. Write two advantages of activation records.
6. List the benefits of modular development approach.
7. Give an example for fact and rules in logic programming language.

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कोर्स कोड : Course Code: **BCA-1.22**	कोर्स शीर्षकः– (Course Title) **Computer Organization**	अधिकतम अंक : 30 **Maximum Marks : 30**

खण्ड अ   अधिकतम अंक : 18

Section-A   **Maximum Marks: 18**

नोट–(Instructions): Section A consists of long answer questions from 1 to 3. Answer should be in 800 to 1000 words.

1. Implement the following Boolen Expression with NOR GATE only.
   F (A, B, C) = Π(0, 2, 4, 6, 7)
   (b) Why NAND and NOR gates are called as Universal gate.
2. Explain the following addressing modes with an example and suggest a use for those addressing modes:
   i. Register Indirect
   ii. Auto increment
   iii. Indirect address
   iv. Base address
   v. Indexed address
3. What is the difference between combinational and sequential circuit? Explain with appropriate example.

खण्ड ब   अधिकतम अंक : 12

Section –B   **Maximum Mark : 12**

नोट–(Instructions): Section B consists of short answer questions from 4 to 7. Answer should be in 200 to 300 words.

4. Differentiate Hardware and Micro-programmed control unit with their advantages and disadvantages.
5. What is instruction cycle? When will be any interrupt processed during the instruction cycle?
6. Describe the role of buses in any system. Explain the different types of buses with suitable examples.
7. What is DMA? Explain DMA transfer modes in detail.

कोर्स कोड : Course Code: **BCA-1.23**	कोर्स शीर्षकः– (Course Title) **Computer Oriented Numerical Techniques**	अधिकतम अंक : 30 **Maximum Marks : 30**

खण्ड अ   अधिकतम अंक : 18

Section-A   **Maximum Marks: 18**

नोट–(Instructions): **Section A consists of long answer questions from 1 to 3. Answer should be in 800 to 1000 words.**

1. Find the roots of the equation $x^2 - 5x + 2 = 0$ correct to five decimal places by Newton Raphson method.
2. What do you mean by Simpson's 1/3 rd and 3/8 th rule. Find the value of $\int 1/\sqrt{(1-x^2)} \, dx$ by Simpson's 1/3 rd rule.
3. For what value k, the following system of equations will have an infinite number of solutions

$$x+y+z=12$$
$$x+3y-z=5$$
$$x+2y-kz=4$$

खण्ड ब   अधिकतम अंक : 12

Section –B   **Maximum Mark : 12**

नोट–(Instructions): **Section B consists of short answer questions from 4 to 7. Answer should be in 200 to 300 words.**

4. Estimate the eigen Values of matrix

$$\begin{vmatrix} 5 & 0 & 1 \\ 0 & 2 & 0 \\ 1 & 0 & 5 \end{vmatrix}$$

5. Find the value of Y for x = 0.1 by Euler's method of the initial value
$$\frac{dy}{dx} = \frac{(y-x)}{(y+x)}, y = 1 \; for \; x = 0.$$

6. By Newton Raphson method find the positive root of f(x) = x - 2sin x. Choose suitable initial guess and perform three iterations.

7. Find the inverse of the matrix
$$A = \begin{vmatrix} 5 & -2 & 4 \\ -2 & 1 & 1 \\ 4 & 1 & 0 \end{vmatrix}$$

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कोर्स कोड :	कोर्स शीर्षकः– (Course Title)	अधिकतम अंक : 30
Course Code: **BCA-E11**	**Computer Architecture**	**Maximum Marks : 30**

खण्ड अ अधिकतम अंक : 18

Section-A **Maximum Marks: 18**

नोट–(Instructions): Section A consists of long answer questions from 1 to 3. Answer should be in 800 to 1000 words.

प्रश्न संख्या 1से 10 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।इस खंड सेकिसी भी तीन प्रश्नों का उत्तर दें।

1. What are the similarities and differences between multiprocessor and multicomputer system? Explain the classification of multiprocessor system.
2. Explain the Pipline scheduleing in detail.
3. Identify the dependences in the following code snippet:
   ADD R1, R2, R3
   DIV R4, R1, R5
   ADD R5, R7, R4
   AND R5, R4, R2

खण्ड ब अधिकतम अंक : 12

Section –B **Maximum Mark : 12**

नोट–(Instructions): Section B consists of short answer questions from 4 to 7. Answer should be in 200 to 300 words.

4. What is cache coherency and how is it eliminated?
5. What are different pipelining hazards and how are they eliminated?
6. Suppose a cache is 10 times faster than main memory & suppose the cache can be used 70% of the time. How much speedup do we gain by using cache?
7. Assume that for a certain processor, a read request takes 50 nanoseconds on a cache miss and 5 nanoseconds on a cache hit. Suppose while running a program, it was observed that 80% of the processor's read requests result in a cache hit. Find the average read access time in nanoseconds.

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कोर्स कोड : Course Code:**BCA-E12**	कोर्स शीर्षकः– (Course Title) *Microprocessor and its Applications*	अधिकतम अंक : 30 **Maximum Marks : 30**

खण्ड अ   अधिकतम अंक : 18

Section-A   **Maximum Marks: 18**

नोट—(Instructions): Section A consists of long answer questions from 1 to 3. Answer should be in 800 to 1000 words.

प्रश्न संख्या 1से 9 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

1. Explain the following.
   (i)   Data Bus.   (ii) Address Bus.   (iii) Control Bus.
2. Explain I/O addressing scheme used in 8086 with neat block diagram.
3. With block diagram describe the working of a DMA controller.

खण्ड ब   अधिकतम अंक : 12

Section –B   **Maximum Mark : 12**

नोट—(Instructions): Section B consists of short answer questions from 4 to 7. Answer should be in 200 to 300 words.

4. What do you mean by Conditional Flag?
5. What are the advantages of segmented memory scheme?
6. What are the flags in machine status word?
7. What is the difference between a microprocessor and a CPU?