उत्तर प्रदेश राजर्षि टण्डन मुक्त विश्वविद्यालय,इलाहाबाद

Bachelor of Computer Applicationकार्यक्रम अधिन्यास सत्र **2020–21**

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. Answer should be in 800 to 1000 words. Attempt <u>any three questions</u> from this section.

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

1. Explain the different classification of Computers? Differentiate between microcomputers mini-computers and main-frames.
2. What are the different categories of languages? Explain various elements of programming language.
3. What are different data communication modes? Explain them.
4. Explain the memory hierarchy. Give characteristics of group ofmemory at each level.
5. What is ISDN? Explain various services provided by ISDN.
6. Explain the differences between followings:
   (i) Compiler and interpreter
   (ii)Spooling and buffering
   (iii) Message switching and Circuit switching.
7. (A) 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.
   (B) Write one feature and use each of the following in MS-Word.
   (i) Template Wizards (ii) Macros (iii) Tab stops
8. (a) Write four differences each of the following.
   (i) Router and Gateway (ii) Ring Topology and Star Topology.
9. What are communication channels in networking? Briefly explain the key features of various transmission media?

खण्ड ब अधिकतम अंक : 12

Section –B **Maximum Mark : 12**

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

प्रश्न संख्या 10 से 21 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

10. Explain the terms: Serial Processing, Batch Processing and Multiprogramming
11. Differentiate between Star, Bus and Ring topology.

12. Explain the steps to perform ‘Find and Replace’ in MS Word.
13. What is a computer virus? Explain different types of computer viruses?
14. Differentiate GUI & CUI. List the advantages of GUI over CUI.
15. What is mail merge? How envelopes can be print by using Mail Merge command?
16. What is Computer virus? Briefly explain different types of computer virus?
17. What are Micros?
18. How you have to insert header and footer in presentation? Explain how graph is created in MS-word.
19. Why you need to perform mail merge?
20. What do you mean by normal view and page layout view of a document? How do they differ from each other?
21. Explain the four categories to programming languages.

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

खण्ड अ **अधिकतम अंक : 18**

Section-A **Maximum Marks : 18**

नोट–(Instructions): Section A consists of long answer questions. Answer should be in 800 to 1000 words. Attempt <u>any three questions</u> from this section.

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

1. What is a stack? What operations are associated with a stack?
2. (a) Discuss about arithmetic operators and relational operators.
   (b) Differentiate between break and continue statements in C language with example.
3. Define AVL tree. Is the statement "Every Binary Tree is an AVL tree" correct? Justify your answer.
4. (a) A company insure its drivers in the following case.
   - If the drivers is married.
   - If the drivers is unmarried, male and above 30 year of age.
   If the driver is unmarried female and above 25 year of age.
   In all other case, the driver is not insured. Write a C program without using logical operator to determine whether the driver
   is insured or not.
   (b) Differentiate between the nested..... if and the switch statement in C language with suitable example.
5. Sort the following list of numbers using Quick Sort in descending order:
   1, 3, 2, 5, 4, 6, 12, 10, Show all the passes.
6. What are various data types used in C? Write its range and format also?
7. Write a program in C to check whether a given string is a palindrome or not? Also give the total number of characters in the string.
8. What is a structure? Create a suitable structure for storing the information about the Technical Institutions in India (Assume appropriate attributes to store the information). List all the institutes for a given state.
9. 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. Answer should be in 200 to 300 words. Attempt <u>any four questions</u> from this section.

प्रश्न संख्या 10 से 21 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

10. Write any five advantages of Pointers over Arrays.
11. Define "Binary Tree". How does a Binary Tree differ from a Tree?

12. Define “Graph”. When can it be said that two vertices of a Graph are connected?
13. Write an algorithm for the addition of two matrices.
14. What is the difference between call by value and call by reference parameter passing techniques.
15. Write a function int power (int x, int n) to return x^n
16. Write a function to return the sum of N number.
17. Write a program to find maximum and minimum elements of an array of size N.
18. What do you mean by storage classes in C language. Writ the difference between static and automatic storage class.
19. Write a program in C language to generate the given series upto terms less than 200.
    1 - 4 + 9 - 16 + 25 .....
20. Differentiate between write and do-while loop with example.
21. Write the output/error of the following code with explanation.

```
Main ( )
{
static int var = 5;
print
f (“%d”, var .... );
if (var)
main ( );
}
```

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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. Answer should be in 800 to 1000 words. Attempt <u>any three questions</u> from this section.

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

1. State and prove Lagrange's mean value theorem
2. Find [dy /dx] if $y = log\frac{(\sqrt{1+x}-\sqrt{1-x})}{(\sqrt{1+x}+\sqrt{1-x})}$
3. Determine the intervals in which the function$f(x) = \frac{(1+x+x2)}{(1-x+x2)}$, x∈ R is increasing or decreasing.
4. a) Integrate $\int cos(x)^5 sin(x)^7\, dx$
   b) Show that Every differentiable function is continuous but converse is not true.
5. a) Find dy/dx if $y = (\text{Sin } x)^x + (x)^{\cos x}$
   b) Find the equation of a sphere which passes through A (0,0,0), B (0,1,0), C (1,0,0), D (0,0,1).
6. 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 : $(x^2 + 2x + 3)^{1/2} = (2x + 5)$
7. Find the area of portion between $y^2=8x$ and $x^2 = 8y$.
8. State and prove Roll theorem and give its geometrical interpretation.
9. 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. Answer should be in 200 to 300 words. Attempt <u>any four questions</u> from this section.

प्रश्न संख्या 10 से 21 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

10. Evaluate $\int (x+1)e^x (xe^x + 5)^4\, dx$

11. Find the are bounded by the curve y=√x and y=x.
12. If 1, w and w 2 are cube root of unity then show that $(1+ w)^2 - (1+w)^3 + w^2 = 0$.
13. Evaluate $lim_{x\to 0}\sqrt{(1+x)} - 1$
14. If α and β are roots of $ax^2 + bx + c = 0$ then find $\alpha^3 + \beta^{3.}$
15. Integrate $\int \frac{dx}{1+sinx}$
16. Explain with example, monotonic functions.
17. Find $\frac{dy}{dx}, if y = x^{x^x}$
18. Prove that inverse of a bijective function is bijective.
19. Prove that : $\frac{sinA}{a} = \frac{sinB}{b} = \frac{sinC}{c}$
20. Trace the curve $y = x^3 - 8x^2 + x + 42$.
21. Find n^{th} derivatives of $e^{(7x+8)}$

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

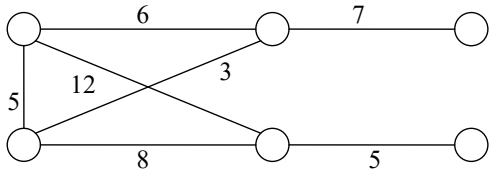
खण्ड अ **अधिकतम अंक : 18**

Section-A **Maximum Marks : 18**

नोट–(Instructions): Section A consists of long answer questions. Answer should be in 800 to 1000 words. Attempt <u>any three questions</u> from this section.

प्रश्न संख्या 1से 3 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

1. Prove that the minimum degree of any node in an n node binomial.
2. 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.
3. Prove that if the weights on the edge of the connected undirected graph are distinct then there is a unique minimum spanning tree. Give an example in this regard. Also discuss Kruskal"s minimum spanning tree in detail.
4. Solve the recurrence relation by iteration
   $T(n) = T(n-1) + n^4$
5. Suppose we are comparing implementations of insertion sort and merge sort on the same machine. For inputs of size n, insertion sort runs in $8n^2$ steps, while merge sort runs in 64 n lg n steps. For which values of n does insertion sort beat merge sort?
6. Find the minimum spanning tree using Prims algorithm for the following graph.



7. Using Dynamic Programming Approach, find the minimum number of scalar multiplications to multiply the chain of matrices given below.

M1	*	M2	*	M3
10*20		20*50		50*1

8. Explain P, NP, NP-Complete and NP-Hard class problems.
9. State the significance of θ, Ω and O notations.
10. Explain Satisfiability Problem?

खण्ड ब **अधिकतम अंक : 12**

Section –B **Maximum Mark : 12**

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

प्रश्न संख्या 11 से 20 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

11. Solve the following recurrence. :
    T(I) = 1
    T(n) = 4T (n/3) + n^2 for x <= 2
12. Show the trace of heapsort algorithm for following input data :
    30, 50, -100, 200, 50, 30, 60, 80, 200 in order.
13. Write an algorithm for inserting a node into Fibonacci Heap.
14. Give an algorithm for Strassens's multiplication. Explain how a divide and conquer strategy is applicable to it? Also analyze your algorithm.
15. Give single source shortest path algorithm. Give the time complexity.
16. Give the non-deterministic algorithm for sorting elements in non-decreasing order.
17. Define Generic Random Access Machine. What assumptions does it have?
18. Explain principle of Optimality.
19. Explain why the statement, "The running time of algorithm A is at least $O(n^2)$," ismeaningless.
20. 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 :	कोर्स शीर्षकः– (Course Title)	अधिकतम अंक : 30
Course Code:**BCA-E2**	**Theory of COmputation**	**Maximum Marks : 30**

खण्ड अ **अधिकतम अंक : 18**

Section-A **Maximum Marks : 18**

नोट–(Instructions): Section A consists of long answer questions. Answer should be in 800 to 1000 words. Attempt <u>any three questions</u> from this section.

प्रश्न संख्या 1से 3 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

1. Differentiate between Mealy Machine and Moore Machine with example.
2. Design Moore and Mealy machine for input from (0 + 1 + 2) print the residue module of '5' of the input treating it as ternary (base 3 with digits 0, 1, 2) number.
3. Construct a NFA for language
   L = (a + b)b(a + bb) .
4. Construct transaction graph for given regular expression.
   r = a (a + b)* ab
5. Write short notes on :
   (i) Chomsky classification of Languages
   (ii) Pushdown Automata.
   (iii) Turing Machine.
6. Show that the grammar
   $S \rightarrow a / a\ b\ s\ b / a\ A\ b$
   $A \rightarrow bs / a\ AA\ b$
   is ambiguous.
7. How TM can be simulate by a production system?
8. What is halting problem?
9. Describe in brief, rules to convert regular expression to transition graph.

खण्ड ब **अधिकतम अंक : 12**

Section –B **Maximum Mark : 12**

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

प्रश्न संख्या 11 से 20 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

10. What do you meant by parse Tree? 2
11. What do you understand by pumping lemma?

12. What do you understand by undecidable problems? State the Halting problem and prove that halting problem is undecidable.
13. Draw finite automat recognizing following language.

    $1\ (1 + 10)^* + 10(0+01)^*$
14. What si the difference between DFA and NFA?
15. What is a context sensitive language?
16. What are the differences between CNF and GNF of grammar?
17. When do you say that a Tuning machine accepts a string.
18. Define the context free language.
19. Prove that if L is a regular set then L is generated by some left linear grammar and right linear grammar.
20. Explains how context free language is accepted by PDA.
21. Define NP Hard problem.

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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. Answer should be in 800 to 1000 words. Attempt <u>any three questions</u> from this section.

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

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. Explain the following with their advantages and disadvantages.

   a. Distributed database b. Client-server database c. Relational database

3. 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.
4. What is entity and attribute? Give some examples of entities and attributes in a manufacturing environment. Why are relationships between entities important?
5. What do you mean by data redundancy? How it is differ from controlled redundancy? What is data independence?
6. Suppose you are given the following requirements for a simple database for the National Hockey League (NHL):

- the NHL has many teams,
- each team has a name, a city, a coach, a captain, and a set of players,
- each player belongs to only one team,
- each player has a name, a position (such as left wing or goalie), a skill level, and a set of injury records,
- a team captain is also a player,
- a game is played between two teams (referred to as host_team and guest_team) and has a date (such as May 11th, 1999) and a score (such as 4 to 2).

Construct a clean and concise ER diagram for the NHL database and transform the E-R diagram to a Relational Schema.

7. 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

8. How do RDBMS provide ACID properties (atomicity, consistency, isolation, durability)?
9. The tourism department wishes to computerize its data. The information consists of monuments of tourist interest, their region and history. Monuments are classified according to historical, religious and architecture importance. The list of facilities mailable at each sport is available. These give living accommodation in terms of hotel, their names, category and the number of rooms available and local transport facilities in terms of service provider name, tour with their tariff and timing.
   (i) Draw an E-R diagram.
   (ii) Transform the E-R diagram to a Relational Schema.

खण्ड ब **अधिकतम अंक : 12**

Section –B **Maximum Mark : 12**

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

प्रश्न संख्या 10 से 21 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

10. *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.*

11. Write relational algebra queries for the following relation:

    Student(ssn, name, address, major)

    Course(code, title) Registered(ssn,code)

    a) Names of students and the titles of courses they registered to.

    b) The titles of courses for which no student is registered.

12. Discuss on the various ways in which we can arrive at a good database design.

13. What is data? What do you mean by information? What are the differences between data and information?

14. Explain 1NF, 2NF and 3NF with an example.
15. Explain how the Boyce-Codd normal form differs from that of 3NF.
16. Who is a DBA? What are the responsibilities of a DBA?

17. The relation schema

Student_Performance (name, courseNo, rollNo, grade)
has the following Fds:
name,courseNo->grade rollNo,courseNo->grade name->rollNo rollNo->name
The highest normal form of this relation scheme is?

18. What is a transaction? Which are the properties of a transaction and explain each.
19. What is a database trigger? Which are the different kinds of triggers?
20. *Discuss the advantages of DBMS over traditional file processing system.*
21. The employee information in a company is stored in the relation.

    Employee:(name,sex,salary,deptName)

    Assuming name is primary key, What is the output of following SQL query?

    SELECT deptName FROM Employee WHERE sex='M' GROUP BY deptName

    HAVING AVG(salary)> (SELECT AVG(salary) FROM Employee);

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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. Answer should be in 800 to 1000 words. Attempt <u>any three questions</u> from this section.

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

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

1. Consider a car-insurance company whose customers own one or more cars each. Each car has associated with it zero to any number of recorded accidents.
   (i) Draw an E-R diagram
   (ii) Transform the E-R diagram to a Relational Schema.
2. How do you create a table and query in Microsoft Access? Write down the steps involved.
3. Explain the differences between the strong entity and weak entity set with suitable example.
4. FLIGHT Table
   Flight-No Text
   Destination Text
   Fare Numeric
   Departure-Time Date~Time

   With reference to the FLIGHT table:
   a) Write down the steps for changing the field contents for the field 'Destination' from "DEL" to "DELHI" and from "CAL" to "CALCUTTA" for all the records.
   b) Create a Filter which will display only those records where Destination is equal to "DELHI" and Fare is greater than 10,000. (Just the steps).

5. 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?

6. What are the multivalue attribute? How do the RDBMS handle the multivalue attribute.
7. Writes down the steps to create a table in MS Access named 'TRANS' having following fields
    - Trans_No which is numeric type and unique.
    - Item_No, Which will store alphanumeric data.
    - Trans_Date which will store transaction date.

8. 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.

22. 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. Answer should be in 200 to 300 words. Attempt <u>any three questions</u> from this section.

प्रश्न संख्या 10 से 21 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

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

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

12. What is derived attribute? Explain the differences between single-valued attributes and multi-valued attributes.

13. What are query wizard used for in MS Access? What is the difference between all of the Queries provided by MS-Access?

14. How many Views does a Form Window have? What is the difference between these views?

15. 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?

16. What are Forms used for? Write down the steps for changing the font of Label and Text Box.

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

18. Write down the steps involves in creating a report. Also writes steps for Preview, Print, and save the report.

19. Discuss the advantages of DBMS over traditional file processing system.

20. What is referential integrity and why is it important?
21. Explain different referential integrity constraints violations with suitable examples.

उत्तर प्रदेश राजर्षि टण्डन मुक्त विश्वविद्यालय,इलाहाबाद

Bachelor of Computer Applicationकार्यक्रम अधिन्यास सत्र **2020–21**

कोर्स कोड :	कोर्स शीर्षकः– (Course Title)	अधिकतम अंक : 30
Course Code: B**CA-1.7**	**Basic Electronics**	**Maximum Marks : 30**

खण्ड अ **अधिकतम अंक : 18**

Section-A **Maximum Marks : 18**

नोट–(Instructions): Section A consists of long answer questions. Answer should be in 800 to 1000 words. Attempt <u>any three questions</u> from this section.

प्रश्न संख्या 1से 10 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

1. What is Modulation? Why is modulation necessary in communication system?
2. What is an Oscillator? What is its need? Discuss the advantage of an Oscillator.
3. Explain RC coupled amplifier in detail with suitable example.
4. Explain why a semi conductor acts as an insulator at 0^o k and why its conductivity increases with increase of temperature.
5. Draw the circuit of Bridge rectifier and explain the working of it. Give its merits and de-merits.
6. Draw the basic circuit for obtaining the static V-I characteristics of thyristor.
7. List various characteristics of A-to-D converter.
8. Explain how the negative feedback increases the input impedance and reduces the output impedance and derive the expressions for input and output impedance of the feedback amplifier.
9. Why phase shift through the R-C feed back network of R-C phase shift oscillator is to be 1800 ? Explain.
10. An amplifier without feedback has A = 5000, lower cut-off frequency f_L = 2.5 Hz, upper cut-off frequency f_H= 100 kHz, output resistance R_0=2000Ω. If negative feed- back in applied to make the output resistance R_{0f} = 600Ω, calculate the value of β, voltage gain and half power frequencies of the feedback amplifier.

खण्ड ब **अधिकतम अंक : 12**

Section –B **Maximum Mark : 12**

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

प्रश्न संख्या 11 से 20 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

1. What are basic logic gates?
2. What are the types of rectifiers?
3. What is crystal diode?
4. What do you mean by Operational Amplifire?
5. What do you mean by Demodulation?

6. Explain the difference between Zener and avalanche breakdown.
7. Explain universal logic gates? How they can be converted into each other?
8. Explain CB, CE and CC configuration in detail.
9. Explain half wave and full wave rectifier with proper diagram.
10. Draw and explain the working of emitter follower.

उत्तर प्रदेश राजर्षि टण्डन मुक्त विश्वविद्यालय,इलाहाबाद

Bachelor of Computer Applicationकार्यक्रम अधिन्यास सत्र **2020–21**

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. Answer should be in 800 to 1000 words. Attempt <u>any three questions</u> from this section.

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

1. (a) Explain basic data mining tasks with an example.
   (b) Give details on data mining versus knowledge discovery in databases.
2. (a) Discuss data mining issues and data mining metrics.
   (b) Define the terms: confidence, cleaning, consequent, cross validation
3. (a) Give an overview of Applications of data mining.
   (b) Discuss issues to consider during data integration
4. What is data mining (D.M.)? Define and describe relation ship and pattern detected in data mining .What is the scope of data mining?
5. Describe the steps involved in knowledge discovery in database (KDD).
6. Explain structure of the data warehouse? Discuss in detail all the steps involve in making a data ware house.
7. Explain OLTP and OLAP and also discuss difference between them?
8. Explain the different partitioning hierarchical clustering methods in details.
9. 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. Answer should be in 200 to 300 words. Attempt <u>any four questions</u> from this section.

प्रश्न संख्या 10 से 21 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

10. Explain various data reduction techniques.
11. Briefly discuss the forms of Data preprocessing with neat diagram.
12. Explain about concept hierarchy generation for categorical data.
13. Draw and explain the architecture of typical data mining system.
14. Differentiate OLTP and OLAP.
15. Explain data mining as a step in the process of knowledge discovery.
16. What are the requirements of cluster analysis?
17. What type of processing takes place in a data ware house?

18. What are the various types of metadata? Explain in detail?
19. What is Classification? What do you mean by data cleaning?
20. How does data warehouse handle multidimensional data?
21. Explain the data structure and schema that support multi-dimensional data with suitable illustration.

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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. Answer should be in 800 to 1000 words. Attempt <u>any three questions</u> from this section.

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

1. Discuss the advantages and disadvantages of Electronic Commerce
2. What do we mean by Electronic Data Interchange? Explain the architecture of EDI with the help of a diagram.
3. Discuss the different classifications of Electronic Commerce.
4. Define the term E-Commerce. Explain its work flow.
5. Define the term "EDI". Explain its architecture with the help of a diagram.
6. Explain the benefits of e-commerce to organizations, customers and society at large.
7. What is on line payment system? Explain in detail. Also, discuss the various risks associated with it.
8. Explain how smart cards and credit cards have roles in e commerce applications
9. Explain the design aspects of a secure E-Commerce system and its applications.

खण्ड ब **अधिकतम अंक : 12**

Section –B **Maximum Mark : 12**

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

प्रश्न संख्या 10 से 21 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

22. Briefly describe the following:
    a. Firewalls
    b. Domain Name System
23. What do we mean by Electronic Fund Transfer? What are the different ways in which fundtransfer can be done electronically?
24. What are the essential requirements for a safe e-payment?
25. Discuss the applications of Electronic Commerce technology.
26. What is a Cyber Crime?
27. Explain any two models of e-commerce.
28. Define the term e-commerce.

29. Explain the security concerns in e-commerce.
30. How did your shopping experience change with the advent of e-commerce?
31. What are advantages and disadvantages of online auctions?
32. Explain the different types of digital documents.
33. How risk is handled in e-Payment system?

उत्तरप्रदेशराजर्षिटण्डनमुक्तविश्वविद्यालय,इलाहाबाद

Bachelor of Computer Application(BCA) कार्यक्रम अधिन्यास सत्र **2020–21**

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

खण्ड अ **अधिकतम अंक : 18**

Section-A **Maximum Marks : 18**

नोट–(Instructions): Section A consists of long answer questions. Answer should be in 800 to 1000 words. Attempt <u>any three questions</u> from this section.

प्रश्न संख्या 1से 10 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

1. What is operator overloading? Illustrate Operator overloading concept to concatenate strings.
2. Explain why do we need to use constructors? Explain a copy constructor with an example.
3. What are the different forms of inheritance supported by C++ ? Explain with examples.
4. Highlight the difference between pure virtual functions and virtual function.
5. Write a program using a try block to detect and throw an exception if the condition "divide by zero" occurs.
6. Explain why Object Oriented Programming approach is better than Structured Programming Approach.
7. What is polymorphism? What are different forms of polymorphism? Explain implementation of polymorphism with the help of a C++ program.
8. Explain the usage of the following C++ operators with the help of an example program.
   (a) sizeof operator (b) Logical Operators (c) Scope resolution operator.
9. 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.

अधिकतम अंक : 12

खण्ड ब

Maximum Mark : 12

Section –B

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

300 words. Attempt <u>any four questions</u> from this section.

खण्ड ब में 01 से 10 तक लघु उत्तरीय प्रश्न है जिनका उत्तर 200 से 300 शब्दों में लिखना है।इस खंड सेकिसी भी तीन प्रश्नों का उत्तर दें।

1. What do you mean by “this” function? What are the applications of “this” pointer?
2. What are pure virtual functions?
3. What do you mean by container classes?
4. What is a Use case? Also explain with example.
5. What is reusability? Which things can be reused?
6. What is friend function? How it is implemented in C++ ?
7. What is template? Explain with suitable example.
8. What are different types of inheritance?
9. What is operator overloading?
10. Write C++ program to create Matrix class.
11. List the features of Object oriented programming.
12. What are input and output streams. Explain.

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Bachelor of Computer Applicationकार्यक्रम अधिन्यास सत्र **2020–21**

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. Answer should be in 800 to 1000 words. Attempt <u>any three questions</u> from this section.

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

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. Explain the important features of Flash Software.
4. Explain the various applications areas of multimedia
5. Define Quick Time and describe its capabilities. What media can be included to it? Where and how can it be use?
6. Explain FIVE considerations in shooting and editing video for use in multimedia.
7. What are the authoring tools? List out some silent features of a good authoring tool.
8. Discuss the role of each member of multimedia production team.
9. Describe in detail any five multimedia input devices and output devices.

खण्ड ब **अधिकतम अंक : 12**

Section –B **Maximum Mark : 12**

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

प्रश्न संख्या 10 से 21 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

11. Explain the following terms:
    a) Hypertext?
    b) Morphing?
12. What do you mean by Sampling?
13. What are the differences between Zooming and Panning pages?
14. Explain the process involved in planning of Multimedia Application.
15. What are the differences between icon based and event based authoring tools?
16. Discuss about digital movie tools.
17. Describe the various component of hypertext.
18. Discuss the application of hypertext in multimedia.
19. What are the differences between the GIF and JPEG?
20. What is video conferencing?

21. What do you mean by Animation? List the all Animation Tools.
22. 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. Answer should be in 800 to 1000 words. Attempt <u>any three questions</u> from this section.

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

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. Define Software Development life cycle (SDLC). List the advantage and disadvantage of waterfall model.
3. What is Software Testing? What are the various characteristics of a good testable software?
4. Explain prototype model of software development. Is prototype model a suitable Model for courier company management system? Justify your answer.
5. What is system analysis? Describe the importance of system analysis in software System development. List any five responsibilities of a System Analyst.
6. What is function point analysis? List four features of it.
7. Explain the following:
   a) Project b) Project scheduling c) Critical Path d) Milestones e) Checkpoints f) Project review.
8. What is strategic planning? Relate strategic planning to management control and operational control.
9. 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. Answer should be in 200 to 300 words. Attempt <u>any four questions</u> from this section.

प्रश्न संख्या 10 से 21 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

10. What are the differences between Black Box Testing" and "White Box Testing"?
11. What do you mean by Software Configuration Management?
12. Discuss the role of PERT Chart in software development.

13. What is coupling and Cohesion? What are the different type of Cohesion?
14. Differentiate between decision table and decision tree.
15. What are the attributes of good analyst?
16. When is Spiral-SDLC Model suitable to use.
17. Explain the system development life cycle.
18. Distinguish between hierarchical structure and network structure.
19. Define Bench Mark?
20. What is brain storming?
21. What is spiral model?

उत्तर प्रदेश राजर्षि टण्डन मुक्त विश्वविद्यालय,इलाहाबाद

Bachelor of Computer Applicationकार्यक्रम अधिन्यास

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

खण्ड अ **अधिकतम अंक : 18**

Section-A **Maximum Marks : 18**

नोट–(Instructions): Section A consists of long answer questions. Answer should be in 800 to 1000 words. Attempt <u>any three questions</u> from this section.

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 is object design? Explain the steps of object design with suitable example.
2. What is multiplie inheritance? Discuss its role in object oriented analysis and design.
3. What is design optimization? Explain with suitable example.
4. Describe in detail the major and minor elements of object model. Give suitable examples.
5. What are the approaches used for identification of classes and attributes? Explain.
6. What is the relationship between cohesion and coupling? Identify the type of coupling in the following. How can it overcome?
7. What do you mean by “Object Oriented”. Explain the characteristics of object-oriented approach.
8. Explain Aggregation & Generalization in detail with suitable example.
9. 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. Answer should be in 200 to 300 words. Attempt <u>any four questions</u> from this section.

प्रश्न संख्या 11 से 20 तक लघुउत्तरीय प्रश्न है जिनका उत्तर 200 से 300 शब्दों में लिखना है।इस खंड से किसी भी चारप्रश्नों का उत्तर दें।

1. Name the UML diagrams used for the following:
   a. Modelling behaviour of an object.
   b. Interaction between groups of objects.
2. How does object relational database differ from object databases? Explain
3. Explain the design axioms applied to object-oriented design.
4. Give the sequence diagram for making a telephone call.
5. Describe the activities involved in an ATM transaction.
6. What do you mean by the State Diagram and the Event Trace Scenario? Draw the Event Trace Scenario for a Phone Call and the State Diagram for Phone Line.
7. Explain what is cohesion and coupling? What is the relationship between them?
8. How does object relational database differ from object databases?
9. What are the shortcomings in structured approach? Why generally, does an object granted system use a relational DBMS?
10. Explain the steps for converting state diagram to code.
11. Differentiate between Class diagram & Instance diagram
12. Differentiate between Links & association.

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

खण्ड अ — अधिकतम अंक : 18

Section-A — **Maximum Marks: 18**

नोट–(Instructions): Section A consists of long answer questions. Answer should be in 800 to 1000 words. Attempt <u>any three questions</u> from this section.

प्रश्न संख्या 1से 10 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

1. What is inheritance? Explain two benefits of inheritance, with an example of each.
2. What is a constructor? Write a Java program to explain how super class constructors are called in their subclasses.
3. What is multithreading? Explain this with an example of how interthread communication takes place in Java.
4. How Access Control Mechanism is implemented in Java?.What Method does subclass inherit from superclass.
5. Write down a java program to display number in word format, for Example: 123 will be shown as “One Two Three”.
6. What is an applet?. List the methods you must extend to design an applet. What is the purpose of <PARAM …..>tag in Applet?
7. What is Object Oriented Paradigm? Expain features of Object Oriented Paradigm. Why Object Oriented Programming are preferred over structured programming?
8. What is static method? Explain why main method in Java is always static and What are different bitwise operators avaialble in Java? Write a Java program to explain the use of bitwise operators.
9. What is overloading of methods? Explain with an example how overloading of methods is different from overriding of methods.
10. 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. Answer should be in 200 to 300 words. Attempt <u>any three questions</u> from this section.

प्रश्न संख्या 11 से 20 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

1. Write down C++ features that are not supported by Java.
2. What is multithreading? Explain with example for removing the synchronicity behavior of a thread.
3. What is the difference between Overloading and Overriding? Is it possible to override a inner classes.
4. (a) What is Servelet ? What are the different methods for running the Servelets?
   (b) Why servlet is preferred over CGI script. Write the life cycle of a servlet.

5. What is a global variable?
6. What is encapsulation?
7. What is multithreaded programming ? Explain how threads are created in Java.
8. What is JDBC?
9. What is an exception?
10. What is an instance variable? Explain how an instance variable of a class can have different value for each object of that class.

उत्तरप्रदेशराजर्षिटण्डनमुक्तविश्वविद्यालय,इलाहाबाद

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

खण्ड अ **अधिकतम अंक : 18**

Section-A **Maximum Marks : 18**

नोट–(Instructions): Section A consists of long answer questions. Answer should be in 800 to 1000 words. Attempt <u>any three questions</u> from this section.

प्रश्न संख्या 1से 10 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

1. What do you understand by the term computer network? List the key component of a network.
2. Differentiate between OSI and TCP reference model in terms of layers. Functionality of each layer and important protocols at each layer.
3. Describe the following transmission techniques with examples:
   (i) Simplex (ii) Half Duplex (iii) Full Duplex
4. What do we mean by Multiplexing? Explainthe three different types of multiplexing techniques.
5. Explain the OSI reference model with the help of a diagram. Give brief description of each layer of the model.
6. 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.
7. Explain the working of Link State Routing Algorithm using an example.
8. Compare and contrast between synchronous and asynchronous transmission using an example for each.
9. Why network models are divided into layers? Write the similarities between TCP/IP and OSI model.

खण्ड ब **अधिकतम अंक : 12**

Section –B **Maximum Mark : 12**

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

प्रश्न संख्या 11 से 20 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

1. Explain the format of TCP header through illustration.
2. Explain the advantage of ISDN.
3. What is the need of multiplexing channels?
4. What are the various transmission media available?
5. Differentiate between the packet switching and Circuit Switching.
6. Explain the working of Distance Vector Routing using an example.
7. List the protocols used for host to host communication in the transport layer of TCP/IP model. What are the important differences between these two protocols?
8. Differentiate between mutlicast addressing and Unicast addressing.
9. What is a parity bit? What is it used for? Explain with example.

10. 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.
11. Write short notes on the following:
    a. Hub b. Repeater
12. Give the purpose of layering. How is the minimum size of an Ethernet frame determined?

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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. Answer should be in 800 to 1000 words. Attempt <u>any three questions</u> from this section.

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

1. Why there is need of process synchronization? Explain how semaphores can be used to deal with n-process critical section problem.
3. What is the need for disk scheduling? Explain the differences between the C-LOOK and C-SCAN disk scheduling algorithms.
4. Define thread. Differentiate user threads and kernel threads.
5. Distinguish between preemptive and non-preemptive scheduling. Explain each type with an example.
6. 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?

7. How does process different from program? Explain different states of process in process state transition with a neat diagram.
8. Discuss how scheduling algorithms are selected for a system. What are the criteria considered?
9. Consider the following page reference string: 1,2,3,4,2,1,5,6,1,2,3,7,6,3,2,1,2,3,6 How many page faults would occur for the LRU, FIFO, LFU and optimal page replacement algorithms assuming three and five frames?

खण्ड ब **अधिकतम अंक : 12**

Section –B **Maximum Mark : 12**

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

प्रश्न संख्या 10 से 21 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

10. Mention the circumferences that would a user be better off using a time-sharing system rather than a PC or a single user workstation?
11. How does thrashing occurs? Explain with an example.
12. What is a TLB? How does it improve effective access time of data?
13. How does a deadlock happens in a system?
14. Explain the scenario when the page fault occurs?
15. What is the purpose of swap space?
16. List out the important services of an operating system.
17. What is purpose of Process Control Block?
18. Describe the differences among long-term scheduling, short-term and medium-term.
19. What are the schemes used in operating system to handle deadlocks?
20. What is a critical section? Give examples.
21. 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. Answer should be in 800 to 1000 words. Attempt <u>any three questions</u> from this section.

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

1. What are the implicit and explicit resources in windows Programming? Explain in detail.
2. Write a program in VB for adding List Box, List Items, Check Box, Radio Button and Menus to your Window.
3. Write a program to check whether the given number is palindrome or not?
4. What are the advantages and disadvantages of VB over any other object-oriented language? Explain with suitable examples.
5. Write a Visual Basic program to calculate the simple interest and compound interest.
6. Discuss various control structures in Visual Basic?
7. Describe in detail two rich text-box controls.
8. Write a Visual Basic program to design a digital clock.
9. Write a Visual Basic program to perform matrix operations.

खण्ड ब — अधिकतम अंक : 12

Section –B — **Maximum Mark : 12**

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

प्रश्न संख्या 10 से 21 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

10. Write short notes in Event – Handler.
11. Explain the concept of database connectivity.
12. Explain the different data types available in VB.
13. What do you mean by the scope of variable in VB?
14. Explain the concept of user-defined procedures.
15. Explain ADO?
16. Explain String Functions in Visual Basic?
17. What are the usage of Msgbox() and InputBox()?
18. Define looping statements in Visual Basic?
19. Explain OLEDB and IDE (Integrated Development Environment)Components?
20. Explain the uses of List box controls and combobox controls.
21. What are the basic differences between checkbox and radio buttons?

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

खण्ड अ — अधिकतम अंक : 18

Section-A — **Maximum Marks : 18**

नोट–(Instructions): Section A consists of long answer questions. Answer should be in 800 to 1000 words. Attempt <u>any three questions</u> from this section.

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

1. What are the five functions used to perform file I/O on a UNIX system? Elaborate each function with example.
2. Define process identifier. Explain the operation of 'fork' function. List the similarities and differences between parent and child process.
3. What are basic I/O models under UNIX? Explain them in detail.
4. Explain exec() functions with syntax.
5. Explain the following with syntax
   a. kill() and raise() functions
   b. alarm() and pause() functions
   c. Pipes in UNIX
6. Explain signal sets and associated functions with syntax.
7. Explain the following with necessary diagram
   i. I/O Multiplexing
   ii. Signal driven I/O
   iii. Asynchronous I/O
8. Write brief usage of following:
   i) DNS
   ii) Resource Records
   iii) Resolvers and Name servers
9. Explain the TCP client-server communication with neat TCP state transition diagram.

खण्ड ब — अधिकतम अंक : 12

Section –B — **Maximum Mark : 12**

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

प्रश्न संख्या 10 से 21 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

10. What is sticky bit?
11. Mention the limitations of pipes.
12. Mention any four socket functions for elementary TCP client server.
13. Give diagram for simple echo client server.

14. Explain the steps in raw socket creation.
15. Explain how a system call is different from Library function?
16. State the difference between fork( ) and exec( ) functions
17. How is a system call different from Library function?
18. What is a socket in TCP communication? Give the IPv4 internet socket address structure.
19. What is meant by zombie state of a process?
20. What is a thread? What is the comparative advantage of using threads over child processes?
21. List out the entities that are shared by all threads within a process.

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

खण्ड अ अधिकतम अंक : 18

Section-A **Maximum Marks: 18**

नोट–(Instructions): Section A consists of long answer questions. Answer should be in 800 to 1000 words. Attempt <u>any three questions</u> from this section.

प्रश्न संख्या 1से 10 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

1. Explain various generation of wireless networks.
2. What is mobile computing? Draw architecture of mobile computing with various applications of mobile computing.
3. Explain IPv4. What are the advantages of IPv6 over IPv4.
4. Explain the concept of IP packet delivery in a mobile system.
5. What is Mobile TCP? What are the disadvantages of conventional TCP to incorporate in wireless environment?
6. What is Mobile TCP? Explain selective retransmission.
7. What is indirect TCP? Explain its pros and cons.
8. Explain the Dynamic Source Routing in Ad-hoc network with an example.
9. Describe in detail about HIPERLAN.
10. What are the main reasons for using cellular system? And also describe the dynamic channel allocation in cellular system.

खण्ड ब अधिकतम अंक : 12

Section –B **Maximum Mark : 12**

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

प्रश्न संख्या 11 से 20 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

7. Explain about the IP mobility support concept.
8. List the differences between IPv4 and IPv6.
9. Explain about the selective retransmission.
10. Define GSM Architecture.
11. Define HLR and VLR.
12. Explain about the handover concept.
13. What are the benefits of location information for routing in ad-hoc network.
14. What is snooping TCP?
15. How does CSMA minimize fading?

16. Is directional antenna useful for mobile phones? Why?
17. Explain the concept behind the Wireless Transaction Protocol.
18. What is meant by MANET?
19. What is reverse tunneling?
20. State the applications of Wireless telephony.

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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. Answer should be in 800 to 1000 words. Attempt <u>any three questions</u> from this section.

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

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. Define Software Development life cycle (SDLC). What is spiral model? List the advantage and disadvantage of waterfall model.
3. What is Software Testing? What are the various characteristics of a good testable software?
4. Write the structure of SRS as per IEEE standards.
5. Explain any two characteristics of a good function oriented design.
6. Explain differences between prototype model and spiral model.
7. Explain prototype model of software development. Is prototype model a suitable
8. Model for courier company management system? Justify your answer.
9. 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. Answer should be in 200 to 300 words. Attempt <u>any four questions</u> from this section.

प्रश्न संख्या 10 से 21 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

10. What do you mean by „Black Box Testing”?
11. What is “White Box Testing”?
12. Define the term “Software Project Management”.
13. What do you mean by Software Configuration Management?
14. What is coupling?
15. Discuss the role of PERT Chart in software development.
16. What is the difference between the verification and validation process?
17. What are the different testing levels?
18. What is Cohesion? What are the different type of Cohesion?
19. What is (SQA)? What are the component of Software Quality Assurance (SQA).

20. What is system analysis? Describe the importance of system analysis in software System development.
21. List any five responsibilities of a System Analyst.

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

खण्ड अ **अधिकतम अंक : 18**

Section-A **Maximum Marks : 18**

नोट–(Instructions): Section A consists of long answer questions. Answer should be in 800 to 1000 words. Attempt <u>any three questions</u> from this section.

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 necessary conditions to hold a deadlock in a system? Explain the resource allocation Graph algorithm to deal with deadlock problem. What are the limitations of this approach?
2. What do you mean by operating system? What are the major functions of operating system?

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

4. What do you mean by Compiler? Discuss the step to design a compiler.

5. What do you mean by system software? Explain in details types of software.

6. How is a process different from a program? What information is contained within a Process Control Block (PCB)?

7. Explain the page fault handling routine in a computer system employing virtual memory.

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

9. 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. Answer should be in 200 to 300 words. Attempt <u>any three questions</u> from this section.

प्रश्न संख्या 11 से 20 तक लघुउत्तरीय प्रश्न है जिनका उत्तर 200 से 300 शब्दों में लिखना है।इस खंड से किसी भी तीन प्रश्नों का उत्तर दें।

1. Discuss the paging system for memory management; also give its advantages and disadvantages.
2. Differentiate between :
   (a) System software and application software
   (b) General purpose OS and real time OS

3. What do you understand by page replacement? Name the algorithm available for page replacement.
4. Write the merits and demerits of Assembly language and High level language.
5. What do you mean by two pass assembler?
6. List the functions of System table.
7. Explain the function of Loader.
8. What do you mean by process? Discuss the different state of a process.
9. What is system cost?
10. What do you mean by Multitasking operating system?
11. Explain the difference between compiler and Interpreter. Write the names of two languages used in compiler and interpreter.
12. What is a scheduler? Explain any two types of schedulers.

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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. Answer should be in 800 to 1000 words. Attempt <u>any three questions</u> from this section.

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

1. List the hardware and software components essential for professional multimedia development. Also, justify the need of each of the hardware components.
2. What is the method of storing image in vector format? Explain its advantages.
3. Explain the important features of Flash Software.
4. What do you understand by multimedia? What are the commercial tools available for developing multimedia?
5. Explain the benefits and problems in multimedia with multimedia system components?
6. Discuss in detail on multimedia platforms and illustrate cross platform compatibility and standards.
7. Explain DDA line drawing algorithm with Example.
8. Describe the matrix formulation of 2D Translation, Scaling and Rotation.
9. Explain Bresenham's circle generating algorithm.

खण्ड ब **अधिकतम अंक : 12**

Section –B **Maximum Mark : 12**

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

प्रश्न संख्या 10 से 21 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

10. Explain the various digital movie tools.
11. What is meant by Image Compression?
12. How is animation useful in multimedia?
13. How much time is spent scanning across each row of pixels during screen refresh on a raster system with a resolution of 1280 x 1024 and a refresh rate of 60 frames/second?
14. Write short note on:
    (a) MPEG
    (b) MP3
15. What do you understand by the term Multimedia and Hypermedia.
16. Explain any two multimedia features which can be used in business.
17. Define following terms:

a) Refresh buffer/frame buffer.
b) Pixel?
c) Aspect ratio.

18. What are the differences between the GIF and JPEG?
19. Consider two raster systems with the resolutions of 640x480, 1280x1024, and 2560x2048. What size frame buffer (in bytes) is needed for each of these systems to store 12 bits/pixel? How much storage is required for each system if 24 bits per pixel are to be stored?
20. List the hardware and software components essential for professional multimedia development.
21. Justify the purpose and need of each of the hardware components in Multimedia.

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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. Answer should be in 800 to 1000 words. Attempt <u>any three questions</u> from this section.

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

1. State the various types of java script statements with examples.
2. Explain the servlet API life cycle methods in brief.
3. Discuss the basic differences between Servlet and JSP.
4. Give the structure of HTTP request message and explain it in detail.
5. List and explain the steps involved in a web based client server communication.
6. Explain the capabilities of web client and web server.
7. Write Java script to find factorial of a given number.
8. Explain how java servlets perform session handling.
9. 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. Answer should be in 200 to 300 words. Attempt <u>any four questions</u> from this section.

प्रश्न संख्या 10 से 21 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

10. Explain the way in which a DNS server resolves addresses.
11. State the use of web server logs and list the contents of a message log.
12. Give some advantages of using cascading style sheets.
13. How does one access cookie in a JavaScript?
14. List and explain any four HTML intrinsic event attributes.
15. What is the purpose of cookies?
16. Compare DOM and SAX in XML processing.
17. Give the advantages of using JSP for server side programming.
18. How is XML parsing done with SAX?
19. What is meant by a XML namespace?
20. Briefly explain the CSS box model.
21. Write a CSS which adds background images and indentation?

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Bachelor of Computer Applicationकार्यक्रम अधिन्यास सत्र **2017–18**

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. Answer should be in 800 to 1000 words. Attempt <u>any three questions</u> from this section.

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

1. Compare and contrast System administrator and Database administrator training with suitable illustrations.
2. Draw the block diagram of client/server architecture and explain the advantages of client/server computing with the help of suitable example.
3. Describe the various ways of reducing network traffic of client server computing.
4. Discuss about the role of traditional and web databases in handling client/server based applications.
5. Discuss the role of client in client/server computing and also explain the various services provided by client.
6. Explain about network management and remote system management. How can security be provided to network?
7. Explain Connectivity and Communication Interface Technology in client/server application. How does transmission protocol work in client/server application?
8. Elaborate the differences between centralized and distributed computing.
9. List and explain the various elements of Distributed Computing Environment.

खण्ड ब **अधिकतम अंक : 12**

Section –B **Maximum Mark : 12**

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

प्रश्न संख्या 10 से 21 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

10. Explain the various ways to improve the performance of Client/Server computing.
11. What is the role of Client in Client/Server environment? Discuss.
12. Why OLE is needed? Explain its importance.
13. Write short notes on Novell Netware.
14. Which layers in OSI model are user support layers? Explain.
15. Define IPC. Explain the essential services provided by IPC.
16. Discuss the importance of Help desk in Client/Server environment.
17. Why Network Management is needed? Explain.

18. Differentiate between stateful and stateless servers.
19. What do you mean by thin client network?
20. What do you understand by threats to server?
21. Explain asynchronous Transfer mode (ATM) in detail.

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Bachelor of Computer Applicationकार्यक्रम अधिन्यास सत्र **2020–21**

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. Answer should be in 800 to 1000 words. Attempt <u>any three questions</u> from this section.

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

1. (a) Discuss features of programming language and its importance.
   (b) Draw the syntax tree for a+b∗ c/d + e-f.
2. (a) Distinguish between data types arrays and records.
   (b) What is call by value and call by reference? Give example.
3. (a) Explain public and private inheritance.
   (b) Write the implementation of objects in small talk.
4. (a) discuss the various approaches to evaluate the expressions.
   (b) Write the procedure for exceptions in functional programming languages
5. (a)Write about the loop invariant, loop variables with examples.
   (b) Write the procedure to implement dictionaries using lists.
6. Write short notes on:
   (a) Pointers
   (b) Polymorphism.
7. (a) Explain stack based storage allocation mechanism.
   (b) Explain iteration control structure.
8. Write any four important uses of programming languages. List the design principles of imperative languages.
9. Explain any two language implementation techniques for bridging the gap between high and low level languages, with neat figures, and their advantages and disadvantages.

खण्ड ब **अधिकतम अंक : 12**

Section –B **Maximum Mark : 12**

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

प्रश्न संख्या 10 से 21 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

10. Write the differences between lexical syntax and concrete syntax of the language.
11. Write the differences between array and enumerated data types in imperative languages?
12. Distinguish between dangling pointers and memory leakage.

13. List the benefits of modular development approach.
14. Write the uses of constructor and destructors in OOP.
15. Convert the infix expression into other notations (a+b)∗ (d+e) / (f+g)
16. Write two advantages of activation records.
17. What is meant by static and dynamic allocation?
18. Write three applications of functional programming.
19. Write two differences between logic programming and concurrent programming.
20. List the benefits of modular development approach.
21. Give an example for fact and rules in logic programming language.

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Bachelor of Computer Applicationकार्यक्रम अधिन्यास सत्र **2020–21**

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. Answer should be in 800 to 1000 words. Attempt <u>any three questions</u> from this section.

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

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. Design a Synchronous Modulus-Six Counter Using SR Flip-Flop The modulus six counter will count 0, 2, 3, 6, 5, and 1.
4. What do you mean by Flip-Flop? Discuss the functions and circuits diagram of different type of flip flop?
5. What is Interrupt? Explain the types of Interrupts.
6. Draw the connections between memory module and processor and explain how data transfer takes place between them.
7. Design a digital circuit that perform the four logic operations of exclusive – OR, exclusive - NOR, NOR and NAND. Use two selection variables.
8. What is the difference between combinational and sequential circuit? Explain with appropriate example.
9. What is input-output interface? Draw and explain block diagram of input-output interface.

खण्ड ब **अधिकतम अंक : 12**

Section –B **Maximum Mark : 12**

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

प्रश्न संख्या 10 से 21 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

10. Differentiate Hardware and Micro-programmed control unit with their advantages and disadvantages.
11. What is instruction cycle? When will be any interrupt processed during the instruction cycle?
12. Describe the role of buses in any system. Explain the different types of buses with suitable examples.
13. Write an assembly language program to find factorial of 10 using loop.
14. What is DMA? Explain DMA transfer modes in detail.
15. Differentiate between RISC and CISC.
16. Draw logic diagram of Arithmetic circuit that performs addition, substraction, Increment and decrement operations.
17. Write a assembly language program to compare values of the three variables and print them in descending order as: Largest = %d, Medium = %d, Smallest = %d.
18. What is the difference between isolated I/O and memory mapped I/O?
19. What do you mean by memory hierarchy? Why registers are present in CPU?
20. Explain the differences among microoperation and microprogram?
21. Write down the micro operations involves in fetch cycle.

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Bachelor of Computer Applicationकार्यक्रम अधिन्यास सत्र **2020–21**

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

खण्ड अ **Section-A**

अधिकतम अंक : 18 **Maximum Marks : 18**

नोट–(Instructions): Section A consists of long answer questions. Answer should be in 800 to 1000 words. Attempt <u>any three questions</u> from this section.

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

1. Solve the following system of equation by Gauss Elimination method:
   4x1 + x2 + x3 = 4
   x1 + 4x2 - 2x3 =4
   3x1 + 2x2 - 4x3 = 6
2. Use Lagrange's interpolation to find the value for x=3 in the following table:
   x: 3.2 2.7 1.0 4.8
   f(x): 22.0 17.8 14.2 38.3
3. Using divided difference, show that the following data represents a third degree polynomial. Obtain this polynomial. Hence, find the value of f(5).
   x: 0 2 3 4 7
   f(x): 4 26 58 112 466
4. Find the roots of the equation $x^2 – 5x + 2 = 0$ correct to five decimal places by Newton Raphson method.
5. 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.
6. Compute the real root of $x^3 - 5x + 3 = 0$ in the interval [1,2] by the Regula falsi method. Perform five iterations only.
7. Differentiate between interpolation and curve fitting.
8. Use the Jacobi method to approximate the solution of the following system of linear equations.
   5x1 – 2x2 + 3x3 = 1
   -3x1 + 9x2 + x3 = 2
   2x1 - x2 - 7x3 = 3
   Continue the iterations until two successive approximations are identical when rounded to three significant digits.

9. 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. Answer should be in 200 to 300 words. Attempt <u>any four questions</u> from this section.

प्रश्न संख्या 10 से 21 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

10. Interpret Newton-Raphson method geometrically.
11. Distinguish between Newton's divided difference interpolation and Lagrange's interpolation?
12. Which of the iterative methods for solving linear system of equations converge faster? Why?
13. Solve the following equation using Newton-Raphson method:
    x2 −4x2 + 4=0
14. If π= 22/7 is approximated as 3.14, find the absolute error and relative error respectively.
15. State and prove Lagrange"s mean Value theorem.
16. Find a root of $3x^3 - x^2 + 3x - 1 = 0$ near $x_0 = 0.2$ in two iterations by Birge-Vieta method.
17. Estimate the eigen Values of matrix
$$\begin{vmatrix} 5 & 0 & 1 \\ 0 & 2 & 0 \\ 1 & 0 & 5 \end{vmatrix}$$
18. Find the value of Y for x = 0.1 by Euler's method of the initial value
$$\frac{dy}{dx} = \frac{(y-x)}{(y+x)}, y = 1 for x = 0.$$
19. By Newton Raphson method find the positive root of f(x) = x - 2sin x. Choose suitable initial guess and perform three iterations.
20. Solve Sin x = x/2 by Newton-Raphson method.
21. 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. Answer should be in 800 to 1000 words. Attempt <u>any three questions</u> from this section.

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. Explain the component of a Computer System.
2. What are the similarities and differences between multiprocessor and multicomputer system? Explain the classification of multiprocessor system.
3. Explain the Pipline scheduleing in detail.
4. Discuss the utility of RISC and CISC Architecture by comparing their various features.
5. Explain the interrupt driven mode of data transfer and the DMA driven data transfer, elaborating on how they are accomplished and their relative merits and demerits.
6. Explain the importance of different addressing modes in computer architecture with suitable example. What are the different addressing modes?
7. Identify the dependences in the following code snippet:
   ADD R1, R2, R3
   DIV R4, R1, R5
   ADD R5, R7, R4
   AND R5, R4, R2
8. Explain the sequential version of the multiplication algorithm and its hardware.
9. Explain how floating point addition is carried out in a computer system. Give an example of the binary floating point addition.

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

खण्ड अ **अधिकतम अंक : 18**

Section-A **Maximum Marks: 18**

नोट–(Instructions): Section A consists of long answer questions. Answer should be in 800 to 1000 words. Attempt <u>any three questions</u> from this section.

प्रश्न संख्या 1से 10 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

1. List the components of computers and explain each in brief. What is the difference between a microprocessor and a CPU?
2. Discuss the features of 8085 interrupts. Also explain the SIM and RIM formats.
3. Explain the following.
   (i) Data Bus. (ii) Address Bus. (iii) Control Bus.
4. Explain the architecture of 8086 in detail with neat block diagram.
5. Explain I/O addressing scheme used in 8086 with neat block diagram.
6. With block diagram describe the working of a DMA controller.
7. Explain the layout and operation of the PCI bus.
8. What is serial data transfer? Explain with neat diagram.
9. Assume that the accumulator contents data bytes 88 hand instruction MOV C, A 4FH is fetched. List the steps decoding and executing the instruction.
10. Explain 8085 Stack in detail.

खण्ड ब **अधिकतम अंक : 12**

Section –B **Maximum Mark : 12**

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

प्रश्न संख्या 11 से 20 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

11. What do you understand by DMA?
12. What is the function of SI and Di Registers?
13. What do you mean by Conditional Flag?
14. What do you understand by Addressing mode?
15. What are the advantages of segmentation?
16. List the feature of 8086 Microprocessor?
17. What are the advantages of segmented memory scheme?
18. What is the use of ALE?
19. List the operating mode of 8259.
20. What are the flags in machine status word?

खण्ड ब अधिकतम अंक : 12

Section –B **Maximum Mark : 12**

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

प्रश्न संख्या 11 से 20 तक लघुउत्तरीय प्रश्न है जिनका उत्तर 200 से 300 शब्दों में लिखना है।इस खंड से किसी भी तीन प्रश्नों का उत्तर दें।

1. What are the different types of ROMs? Discuss.
2. Explain the concept of virtual memory.
3. What is hit ratio? What is Dynamic Scheduling?
4. Why is the data transfer rate slow in RAID level schema? Explain.
5. Explain Multi-core Processor?
6. What is cache coherency and how is it eliminated?
7. What are different pipelining hazards and how are they eliminated?
8. 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?
9. A no pipeline system takes 50 ns to process a task. The same task can be processed in 6 segment pipeline with a clock cycle of 10 ns. Determine the speedup ratio of pipeline for 100 tasks.
10. 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.
11. What do you mean by instruction cycle and interrupt cycle? Explain with example.
12. Explain the difference between hardwired and micro programmed control unit.