



ARKA JAIN University, Jharkhand

2ndSemester Final Examination – 2019-20

Subject: Programming with C++

Course: MCA

Full Marks: 70

Time: 3 Hours

Pass Marks: 28

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- Candidates are required to give their answers in their own words as far as practicable.
 - Question Paper is divided into **Three Parts –A,B& C**
 - **Part-A** contains **SIX** questions out of which **FOUR** questions are to be answered.
 - **Part- B** contains **FIVE** questions out of which **THREE** questions are to be answered.
 - **Part- C** contains **TWO** questions. All are compulsory.
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PART A

Q1.) Answer any **FOUR**

(5x4=20)

- i) Differentiate between runtime polymorphism and compile time polymorphism.
- ii) What is the significance of a pure virtual function.
- iii) What is an exception and how do you handle exceptions.
- iv) What is the difference between static and constant data members/member functions.
- v) What is constructor overloading. Explain with a small code.
- vi) Write short note on inline function.

PART B

Answer any **THREE**

(10x3=30)

- Q2.) What is inheritance. How many types of inheritance is possible in C++. Explain each.
- Q3.) WAP in C++ to overload + (plus operator).
- Q4.) WAP in C++ to add data objects of two different classes using friend function.
- Q5.) WAP in C++ to count the number of objects created of a particular class.
- Q6.) What are the limitations of C language.

PART C

All questions are compulsory

(10x2=20)

- Q7.) Define pointers. Explain the different types of pointers (void, null, constant, dangling) with small examples.
- Q8.) WAP in C++ to illustrate multiple inheritance.



ARKA JAIN University, Jharkhand

2nd Semester Final Examination – 2019-20

Subject : Data Structure with C

Time : 3 Hours

Course: MCA

Full Marks : 70

Pass Marks: 28

- Candidates are required to give their answers in their own words as far as practicable.
- Question Paper is divided into **Three Parts –A, B & C**
- **Part-A** contains **SIX** questions, out of which **FOUR** questions are to be answered.
- **Part- B** contains **FIVE** questions out of which **THREE** questions are to be answered.
- **Part- C** contains **ONE** question which is compulsory.

PART A

Q.1) Answer any FOUR

(5x4=20)

- What is the difference between Stack and Queue.
- Explain AVL Tree.
- Explain the term “ Binary Tree” and “ Binary Search Tree”.
- What is the prefix form of $(A*B+(C/D))-F$.
- Write down the algorithm to insert in a Queue.
- What is Hashing. Explain its different types.

PART B

Answer any THREE:

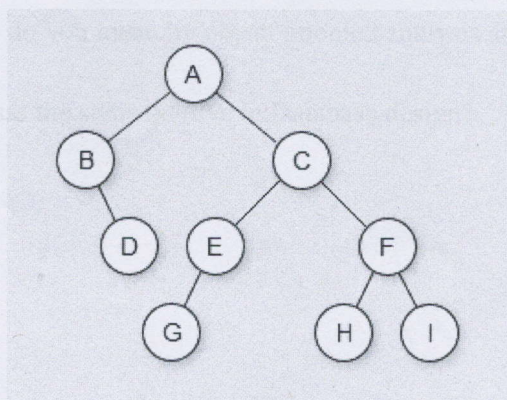
(10x3=30)

Q.2) Construct Binary Tree from the expression a. $(A+B)*(C+D)*(E+F)$

b. Sort the following using Insertion sort : 25,15,30,9,99,20,26

Q.3) Briefly explain Quick sort. Sort the following using Quick sort : 26,77,14,68,61,97,39,99,90.

Q.4) Explain various types of traversal of Binary Tree. Find Preorder, Post order and Inorder traversal of the following tree



Q.5) Construct AVL Tree from the following elements: BRIJESH, IMRAN, NAVIN, LOVELY, PRITI, JASSI, AJIT, HEMA

Q.6) What is Linear Probing? Let us consider a simple hash function as “key mod 7” and sequence of keys as 50, 700, 76, 85, 92, 73, 101.

PART C

Q.7) Question is Compulsory

(20x1)

i) a. Evaluate the following Postfix Expression

4589+-+

4025 + 2922-24+

24159 ^/10+

40 25 + 20 5 * 3 +

b. Write a C program to push an element in Stack



ARKA JAIN University, Jharkhand

2nd Semester Final Examination – 2018-19

Subject: Information System Analysis and Design

Course: MCA

Full Marks: 70

Time: 3 Hours

Pass Marks: 28

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- Candidates are required to give their answers in their own words as far as practicable.
 - Question Paper is divided into **Three Parts –A, B & C**
 - **Part-A & C** are compulsory.
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PART A

Attempt any Four

(5 X 4=20)

1. What do you mean by Risk detection?
2. What is JAD?
3. What do you mean by Software review?
4. What is prototyping?
5. What do you mean by feasibility study?

PART B

Answer any Three:

(10x3=30)

6. What do you mean by Project Matrics? Explain different types of project matrics.
7. What do you mean by Software Project estimation? Explain it different steps.
8. What are the attributes of Software quality?
9. What do you mean by object oriented analysis and design?
10. Discuss the steps involve in Database design?

PART C

Case Study/Analytical Question

(1x20=20)

Q. 11) Discuss the different phases of SDLC in detail.

What is User Interface Design?

What do you mean by Logic design?

What is functional modeling?

What are the steps involve in cost estimation of a project?

What is CASE?

What do you mean by feasibility study? Explain different types of feasibility study.

What is DFD? Explain different component used in logical and physical DFD design



ARKA JAIN University, Jharkhand

2nd Semester Final Examination – 2018-19

Subject: OS

Time: 3 Hours

Course: MCA
Full Marks: 70
Pass Marks: 28

- Candidates are required to give their answers in their own words as far as practicable.
- Question Paper is divided into **Four Parts –A, B & C**
- **Part-A** contains **Five** questions out of which **FOUR** questions are to be answered.
- **Part- B** contains **Five** questions out of which **Three** questions are to be answered.
- **Part-C** is compulsory.

PART A

Q1.) Short Answer Type, Attempt any four.

(5x4=20)

- Explain various types of program threats.
- Difference between process and thread.
- Discuss differences between paging and segmentation.
- Describe the difference between external and internal fragmentation.
- What is a race condition? Explain how a critical section avoids this condition.

PART B

Q2.) Long Answer Type, Attempt any four:

(10x3=30)

- What do you mean by system call? Also discuss different types of system calls.
- Discuss the dining philosopher problem with its solution
- Describe the general strategy behind deadlock prevention, and give an example of a practical deadlock prevention method.
- Consider the set of the processes with their arrival time and execution time given below
Consider the following scheduling algorithms:
FCFS, Round Robin (with quantum = 2) and Round Robin (using quantum = 1)

Process	Arrival Time	Execution Time
A	0	4
B	2	7
C	3	3
D	3.5	3
E	4	5

- Write short notes on any two: a) Semaphores b) Monitor c) Swapping
- Explain directory with its advantages? Explain different types of directory.

PART C

Q3.)

(2x10=20)

- What is page map table? Show its implementation.
- What is the process life cycle? Explain its every step. Also explain context switching.



ARKA JAIN University, Jharkhand

4th Semester Final Examination – 2019-20

Subject : Mathematical Foundation , Probability Combinatorics

Course: MCA

Time : 3 Hours

Full Marks : 70

Pass Marks: 28

- Candidates are required to give their answers in their own words as far as practicable.
- Question Paper is divided into **Three Parts –A, B & C**
- **Part-A** contains **SIX** questions, out of which **FOUR** questions are to be answered.
- **Part- B** contains **FIVE** questions out of which **THREE** questions are to be answered.
- **Part- C** contains **ONE** question which is compulsory.

PART A

Q.1) Answer any **FOUR**

(5x4=20)

- Prove that $\sim(p \wedge q) = \sim p \vee \sim q$
- Prove that $(ab)^2 = a^2 b^2$ for all choices of $a, b \in G$ if G is abelian group.
- Solve the equation $x e^x = \cos x$. By regula falsi method correct up to 4 decimal places
- A graph of the function is passing through the points $(0,7), (1,10), (2,13), (3,22)$ and $(4, 43)$. using newton's forward difference interpolation formula, find the function?
- Using taylor's series method, find the value of $y(0.1)$ given $\frac{dy}{dx} = x^2 + y^2$ and $y(0)=1$.
- A committee of 5 is to be formed out of the 6 men and 4 ladies. in how many ways can this can be done, when (i) atleast two ladies are included (ii) atmost 2 ladies are included.

PART B

Q.2) Answer any **THREE**:

(10x3=30)

- Define conditional and biconditional statements with truth table? Also define converse, inverse and contra positive, of $p \rightarrow q$.
- Using Picard methods to obtained the approximate solution of the ODE $\frac{dy}{dx} = x^2 + y^2$ for $x=0.4$, Given $y(0)=0$
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- Evaluate $\int_0^1 \frac{dx}{1+x^2}$ by using (i) trapezoidal rule (ii) simpson's 1/3 rule (iii) simpson's 3/8 rule
- prove that
 - The identity element in a group is unique
 - The inverse of an element in a group is unique
- Examine if the set Z of all integers forms a group with respect to the operation $*$ defined by $a * b = a + b + 1$ for all $a, b \in Z$

- vii) find the number of arrangements of the letters of the word "INDEPENDENCE", in how many of these arrangements (i) do the words start with P (ii) do all vowels occur together (iii) vowels never occur together ? (iv) Do the words begins with I and end with P
- viii) solve the following system of the equation by gauss elimination method
- $$\begin{aligned}x+5y+z &= 17 \\ 2x+y+3z &= 13 \\ 3x+y+4z &= 17\end{aligned}$$

PART.C

Q.3) Question is Compulsory

(20x1)

- i) find the real root of the equation $x^3-x-4=0$ using bisection method correct up to 3 decimal places