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**B.Tech. 4th Semester (CSE G.-Scheme)**

**Examination, May-2024**

**DISCRETE MATHEMATICS**

**Paper-PCC-CSE-202G**

*Time allowed : 3 hours]*

*[Maximum marks : 75*

*Note : Attempt five questions in total by selecting one from each unit. Q. No. 1 is compulsory.*

- (a) Define relation between two sets.
- (b) Define Binary relation.
- (c) State fundamental theorem of arithmetic.
- (d) Define monoids with the help of suitable example.
- (e) Define integral domain.
- (f) Define Trees.

**Unit-I**

- (a) Describe different types of sets with the help of suitable example.
- (b) Define function and hence explain inverse and composite functions.

Explain the following terms in short :

- (i) Logical operations
- (ii) Contradictions
- (iii) Quantifiers and their use

085-P-3-Q-9(24)

[P.T.O.]

**Unit-II**

4. What is the number of ways of choosing 4 cards from a pack of 52 playing cards? In how many of these:
- Four cards are of the same suit
  - Four cards belong to four different suits.
  - All face cards
  - Two are red cards and two are black cards
  - Cards are of the same colour?
5. Solve the following difference equations :
- $a_r + 6a_{r-1} + 12a_{r-2} + 8a_{r-3} = 0$
  - $a_r + a_{r-1} = 3r 2^r$ .

**Unit-III**

6. Define the following terms with the help of suitable examples:
- Quotient structures
  - Permutation group
  - Cyclic group

7. Define and give an example for the following terms:
- Fields
  - Boolean functions
  - Disjunctive and conjunctive Normal form

**Unit-IV**

8. Write short note on :
- Sub graph
  - Multigraphs
  - Shortest path in weighted graph
9. Explain following terms in short :
- Trees sorting
  - Minimum spanning tree
  - Hamilton path and circuits

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B. Tech. (CSE) 4<sup>th</sup> Semester

(G-Scheme) Examination, May-2024

**COMPUTER ORGANIZATION & ARCHITECTURE**

**Paper-PCC-CSE-204-G**

*Time allowed : 3 hours]*

*[Maximum marks : 75*

*Note : Question No. 1 is compulsory. Attempt five questions in total selecting one question from each unit.*

1. Write short note on : 6×2.5=15
- (a) Application of Grey Codes
  - (b) Differentiate Computer Architecture & Computer Organization.
  - (c) Effective address
  - (d) Need of different Addressing modes
  - (e) Amdhal's Law
  - (f) Software Interrupts

**Unit-I**

2. Represent  $(1259.125)_{10}$  into Single and Double precision format of floating point representation. 15
3. (a) Explain different Alphanumeric codes in detail. 8  
(b) Explain Arithmetic Shift Microoperation with example. 7

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[P.T.O.]

**Unit-II**

4. Explain Interrupt cycle with suitable example. 15
5. (a) Explain all phases of ISZ instruction with example. 8
- (b) Differentiate Indexed Addressing Modes and Base Register Addressing Mode. 7

**Unit-III**

6. Explain Flynn's classification in details. 15
7. (a) 80% of program's execution time occurs inside a loop that can be executed in parallel and rest 20% in serial. What is the maximum speed up we should expect from a parallel version of the program executing on 8 CPUs. 8
- (b) Explain cache coherency in detail. 7

**Unit-IV**

8. Explain Direct Memory Access (DMA) Transfer in a computer system. 15
9. (a) Explain Address Mapping in Virtual memory. 8
- (b) Explain Associative Memory in detail. 7

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B. Tech (CSE) 4<sup>th</sup> Semester G-Scheme

Examination, May-2024

OPERATING SYSTEM

Paper-PCC-CSE-206-G

*Time allowed : 3 hours]*

*[Maximum marks : 75*

*Note : Question No. 1 is compulsory. Attempt one question from each unit.*

1. Explain the following :
  - (a) What are the Minimum Conditions for deadlock occurs ? 2½
  - (b) Distributed system vs Centralized Systems. 2½
  - (c) Difference between paging and segmentation. 2½
  - (d) What is critical section problem? 2½
  - (e) Briefly define Reader's & Writer Problem. 2½
  - (f) What is the cause thrashing ? How does system detect thrashing ? 2½

**Unit-I**

2. (a) Consider FCFS algorithm for three compute-bound process. IF we have three processes P1 takes 15 seconds, P2 takes 4 seconds, P3 takes 6 seconds. If arrive in order P1, P2, P3 what is :
  - (i) Turnaround time
  - (ii) Waiting time
  - (iii) Throughput 10

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[P.T.O.]

(2)

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- (b) What is process scheduling? Explain context switching in detail.
3. (a) What is an operating system and its functions? Explain the functions and services of operating systems.
- (b) What is threading? Explain its benefits and types of threading?

### Unit-II

4. What is Deadlock? Explain various methods for detection, prevention, and recovery of deadlocks.
5. (a) What is critical section? Explain race conditions that occur in the critical section.
- (b) What is the Producer/Consumer Problem? Explain Semaphore briefly.

### Unit-III

6. Consider the following reference string :  
1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6  
How many page faults will occur for :  
(a) FIFO  
(b) LRU  
Assuming 3 and 4 frames.
7. (a) Explain the concept of virtual memory and how it is obtained by demand paging and segmentation?  
(b) Briefly explain demand paging.

(3)

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### Unit-IV

Considering an ordered disk queue with requests involving tracks 98, 183, 37, 122, 14, 124, 65, and 67.

If the read/write head is initially at track 53, what is the total distance that the disk arm moves to satisfy all the pending requests for FCFS and SSTF?

15

Write a short note on :

15

- (i) Unix operating system
- (ii) Directory structure of Operating system
- (iii) Disk Scheduling
- (iv) Various access methods of file system

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B. Tech. (CSE), 4<sup>th</sup> Semester, (G-Scheme)  
Examination, May-2024

COMPUTER SCIENCE AND ENGINEERING

Paper-PCC-CSE-208-G

Object Oriented Programming

Time allowed : 3 hours]

[Maximum marks : 75

*Note : Question No. 1 is compulsory. Attempt five questions in total, the first being compulsory, and select one from each unit.*

1. (i) Define Data Abstraction. Give a suitable example. 2.5
- (ii) Differentiate between local and global variables. 2.5
- (iii) What is polymorphism? 2.5
- (iv) What is reusability? 2.5
- (v) Define Abstract classes. 2.5
- (vi) What is error handling in C++? 2.5

**Unit-I**

2. (a) What is Object Oriented Programming? What are its various important characteristics? 5
- (b) What is recursion? Write a program in C++ for finding a factorial of a number using recursion. 5
- (c) Differentiate between abstraction and encapsulation in C++. 5

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- 3. (a) What is a function? Write a C++ program to find the compound interest using the concept of function.
- (b) What are storage classes in C++? Explain.

**Unit-II**

- 4. (a) What is inheritance? Explain hierarchical inheritance using a suitable C++ program.
- (b) Differentiate between inheritance and polymorphism.
- (c) What is public, private, and protected inheritance in C++?
- 5. (a) What are Dangling, Void, Null, and Wild Pointers in C++?
- (b) Difference between constant pointer, pointers to constant, and constant pointers to constants.

**Unit-III**

- 6. (a) What is a constructor? Explain the copy constructor with a C++ program based on it.
- (b) What is operator overloading? Differentiate between operator overloading and overriding.

- 7. (a) What is virtual function? Explain using suitable code. 7
- (b) What is virtual destructor? 3
- (c) What is run time polymorphism? Explain. 5

**Unit-IV**

- 8. What is exception handling? Explain throwing, catching, and Re-throwing an exception in detail. 15
- 9. (a) What are generics in C++? Explain its advantages. 7
- (b) What are templates in C++? How do templates work? Explain the types of templates in C++. 8

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B.Tech. 4<sup>th</sup> Semester, (C.S.E.)

Examination, May-2024

WEB TECHNOLOGIES

Paper-PCC-CSE-210-G (A)

Time allowed : 3 hours]

[Maximum marks : 75

Note : Attempt any five questions. First question is compulsory.

1. Write short note on : 3×5=15
- (a) W3C
  - (b) URL
  - (c) XML Schemas

**Unit-1**

2. Explain the concept of Internet in detail. 15
3. Explain different HTML tags with their proper attributes and syntax. 15

**Unit-2**

4. Explain the following :
- (a) XML applications 8
  - (b) Features of XML 7

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5. Explain simple API in XML and SOAP (Simple Object Access Protocol) Technologies in detail. 1

### Unit-3

6. Write structure and functions of PHP in detail? 1
7. Why AJAX Technology is required to develop more user friendly web pages. 1

### Unit-4

8. Explain PHP in detail and write proper example programs. 1
9. Explain the following :
- (a) AJAX database 8
  - (b) AJAX with PHP 7