## 86071

# Master of Science (Computer Science)
## 1st Semester
## Examination – December, 2024
### DISCRETE MATHEMATICAL STRUCTURES
Paper : 24CSC201DS01

**Time : Three Hours ]**                                  **[ Maximum Marks : 70**

*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

**Note :** Attempt *five* questions in all. Question No. 1 is *compulsory*. In addition to *compulsory* question, attempt *four* more questions, selecting *one* question from each Unit. All questions carry equal marks.

1. *Compulsory question :*                                      $7 \times 2$

   (i)  Is $g = \{(1, 1), (2, 3), (3, 5), (4, 7)\}$ a function ? If $g$ is described by $g(x) = \alpha x + \beta y$, then what value should be assigned to $\alpha$ and $\beta$ ?

(ii) If $R = \{(a, a^3) : a$ is a prime number less than 5} be a relation. Find the range of $R$.

(iii) If the ordered Pairs $(x - 1, y + 3)$ and $(2, x + 4)$ are equal, find $x$ and $y$.

(iv) If set A has $n$ elements, then how many functions are there from A to A.

(v) Define Kleen closure with suitable example.

(vi) Write down the rule of Modus tollens in arguments.

(vii) What is unit matrix ?

## UNIT – I

2. (a) Explain the following with the help of suitable examples :  4, 3

   (i) Operations on sets

   (ii) Representation of sets

   (b) Prove that intersection of sets is distributive with respect to union of sets i.e.  7

   $$X \cap (Y \cup Z) = (X \cap Y) \cup (X \cap Z)$$

3. What do you mean by relation ? Explain the different types of relation with the help of suitable example. Also show that the following relation is equivalence relation or not :  14

(a) The relation $R = \{a - b$ is divisible by 5 $\forall\ a, b \in I_+\}$

(b) The relation $R = A \times A$ where $A = \{1, 2, 3, 4\}$

## UNIT – II

4. (a) Prove that $1 + 2 + 2^2 + 2^3 + ....... + 2^n = 2^{n+1} - 1\ (n \geq 0)$ using principle of mathematical induction, where $n$ is natural number. 7

(b) Negate the statements 3

(i) All integers are greater than 8.

(ii) For all real numbers $x$, if $x > 3$ then $x^2 > 9$.

(c) Construct the truth table of the proposition 4
$\sim(p \vee q) \vee (\sim p \vee \sim q)$

5. (a) Prove that the following argument is valid : "all dogs are carnivorous". "some animals are dogs". Therefore "some animals are carnivorous". 3

(b) Prove that for any *three* propositions $P, Q, R$ the compound proposition is a tautology or Contingency.
$$(P \to (Q \to R)) \to ((P \to Q) \to (P \to R))$$
6

(c) Differentiate between CNF and DNF with the help of suitable explanation & example. 5

## UNIT – III

**6.** Explain the term matrix. What are the various types of matrices available, give suitable example ? Solve the following : $A = \begin{bmatrix} 2 & 1 \\ 3 & 4 \end{bmatrix}$, $B = \begin{bmatrix} 5 & 2 \\ 7 & 4 \end{bmatrix}$, $C = \begin{bmatrix} 2 & 5 \\ 3 & 8 \end{bmatrix}$, find the matrix D such that $CD - AB = 0$    **14**

**7.** (a) What do you mean by determinant ? Write down the different properties of determinant with the help of suitable example. Also prove that

$$\begin{vmatrix} a & a+b & a+b+c \\ 2a & 3a+2b & 4a+3b+2c \\ 3a & 6a+3b & 10a+6b+3c \end{vmatrix} = a^3$$    **10**

(b) Using determinant, find the area of triangle with vertices (5, 6), (12, –3) and (1, 2)    **4**

## UNIT – IV

**8.** Distinguish between the following :    **2 × 7**

(a) DFA and NDFA

(b) Mealy and Moore Machine

**9.** Explain the term grammar in automata. Also explain Chomsky hierarchy of grammar with suitable production rules and with the help of diagram, show that which grammar is the subset of other grammar ?

**14**

# 86072

## Master of Science (Computer Science)
## 1st Semester
## Examination – December, 2024
### COMPUTER NETWORKS
#### Paper : 24CSC201DS02

*Time : Three hours ]*                    *[ Maximum Marks : 50*

*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

*Note :* Attempt *five* questions in all, selecting *one* question from each Unit. Question No. 1 is *compulsory*. All question carry equal marks.

1.  (a)  What is RSA algorithm ?                 2 × 5 = 10

    (b)  What is routing ?

    (c)  Name two well-known data transport protocols provided by the Internet Transport Layer.

    (d)  What is framing in the data link layer ?

    (e)  What is the difference between HTTP and HTTPS ?

## UNIT - I

2. (a) What is the significance of the OSI and TCP/IP reference models in understanding network architecture ? Explain. 5

   (b) What is multiplexing ? How does it optimize the use of communication channels ? Explain. 5

3. (a) What are the key differences between twisted pair cables, coaxial cables, and optical fibers in terms of speed, cost, and usage ? Explain. 5

   (b) What are the advantages and disadvantages of different network topologies such as star, bus, and mesh ? Explain. 5

## UNIT - II

4. (a) How does circuit switching differ from packet switching in terms of resource allocation and efficiency ? Illustrate. 5

   (b) What are cyclic redundancy check (CRC) codes ? How CRC codes detect errors in transmitted data ? Illustrate. 5

5. (a) How do you compare the performance of ALOHA and Carrier Sense Multiple Access (CSMA) in a network with high traffic ? Illustrate. 5

(b) What is token ring ? Explain how a token ring protocol ensures fair access to the network.  5

## UNIT - III

6. (a) What is IPv6 ? What are the key features of IPv6 addressing ? What are its advantages over IPv4 ? Explain.  5

(b) Differentiate between Standard Ethernet, Fast Ethernet, Gigabit Ethernet, and 10G Ethernet.  5

7. (a) How does the IEEE 802.11 standard differ from Bluetooth in terms of range, speed, and typical use cases ? Explain.  5

(b) What is Address Resolution Protocol (ARP) ? How does it work ? Why is it essential in IPv4 networking ? Explain.  5

## UNIT - IV

8. (a) How do firewalls work to protect networks from unauthorized access ? What are their limitations ? Illustrate.  5

(b) What is the role of the Domain Name System (DNS) in the Internet, and how does it translate domain names into IP addresses ? Illustrate.  5

**9.** (a) How does the reliability provided by TCP differ from the connectionless nature of UDP ? Where are each protocol more suitable ? Illustrate.  5

(b) What is SMTP ? Describe the steps involved in sending an email using SMTP ? How it interacts with other protocols like POP3 or IMAP ? Explain.  5

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# 86073

# Master of Science (Computer Science)
## 1st Semester
## Examination – December, 2024

## COMPUTER FUNDAMENTALS & PROGRAMMING IN C
### Paper : 24CSC201DS03

Time : Three Hours ]　　　　　　　[ Maximum Marks : 50

*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

Note : Attempt *five* questions in all, selecting *one* question from each Unit. Question No. 1 is *compulsory*. All questions carry equal marks.

1. *Compulsory Questions* :

   (a) What can be the remedial solution for computer crime?　　　　　　　　　　　　　2

   (b) What is pseudocode ? Mention its disadvantages also.　　　　　　　　　　　　　2

(c) What is null character ? What is its use in a string ?

2

(d) What are the features of union data type ?    2

(e) What is file positioning ?    2

## UNIT – I

2. (a) What are various functional units of a computer system ? Discuss with example.    5

(b) What is computer virus ? What are various types of threat & remedial solutions for viruses ?    5

3. (a) What is an operating system ? Why it is known as resource manager ?    5

(b) Explain the concept of programming language with its classification.    5

## UNIT – II

4. (a) What is problem solving ? List out various stages of problem solving.    5

(b) What is an algorithm ? Discuss its characteristics. Write an algorithm to print even number from 2 to 100.    5

5. (a) What are the common approaches used for problem solving and program design ? Explain with example.    5

(b) How C is Format free language ? Discuss the structure of a C program. 5

## UNIT – III

6. (a) What is recursion ? Discuss the use of recursive function. Write the recursive function to find the factorial of a given integer. 5

(b) What is an array ? How array is declared in C ? Write a program to find the maximum and minimum in an array of 100 integers and their locations. 5

7. (a) What are various storage classes in C ? Discuss their uses and scope with example. 5

(b) How is a pointer initialized ? Write a C program using pointer to find the longest word in a given string. 5

## UNIT – IV

8. (a) What is structure ? How members of the strucure are accessed in C program ? Explain a structure within a structure by giving an example. 5

(b) What is preprocessor ? Explain various preprocessor directives. 5

P. T. O.

8. (a) What are different ways for categorisation of files ? Write a program to show the opening and closing of file. 5

(b) What is debugging ? Explain different types of errors occurred at the compile time. 5

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# 86074

# Master of Science (Computer Science)
## 1st Sem. Examination – December, 2024
### COMPUTER ORGANIZATION AND ARCHITECTURE
### Paper : 24CSC201DS04

Time : Three Hours ]　　　　　　　[ Maximum Marks : 50

*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

Note : Attempt *five* questions in all, selecting *one* question from each Unit. Question No. **1** is *compulsory*. All questions carry equal marks.

1. (a) What are array processors ?

   (b) What is De Morgan's Law ?

   (c) What are register-reference instructions ?

   (d) What is the difference between flip-flop and latch ?

   (e) What is a bus ?　　　　　　　$2 \times 5 = 10$

## UNIT – I

2. (a) What is a Decoder ? Design a 3 x 8 decoder and explain its working. 5

   (b) Simplify the following Boolean expression using K-map : 5

   $F (a, b, c, d) = \Sigma (0, 1, 2, 4, 5, 6, 8, 9, 12, 13, 14)$

   and obtain the expression in SOP and POS.

3. (a) What is Multiplexer (MUX) ? Design a 4 × 1 MUX and explain its working. 5

   (b) Perform the operation $(C4.8)_{16} - (45.4)_8 + (25.75)_{10}$ and find out the result in decimal number system. 5

## UNIT – II

4. What are micro-operations ? What are its various types ? Illustrate the implementation of each category of micro-operations through its block diagram(s). 10

5. (a) What do you mean by an Instruction Cycle ? What are various sub-cycles in an Instruction Cycle ? Also outline the steps performed during each of these sub-cycles. 5

(b) What is an Instruction Set ? How an instruction is represented ? Also enumerate the factors which play important role for selection of an Instruction Set for a machine. 5

## UNIT – III

6. (a) What is an Input/Output (I/O) module ? What are the functions performed by an I/O module ? Illustrate the general structure of an I/O module. 5

(b) What do you understand by priority interrupt ? Discuss their significance as well as implementation. 5

7. Explain the following :

(a) DMA 5

(b) Memory Hierarchy 5

## UNIT – IV

8. (a) What do you understand by Vector Processing ? State its significance and also enumerate certain applications which demand Vector Processing. 5

(b) How does RISC architecture differ from CISC ? Briefly discuss the main characteristics of RISC architecture. 5

**9.** (a) What is Pipelining ? When, where and why is it necessary ? Also differentiate between the Instruction Pipelining and Arithmetic Pipelining. 5

(b) What is Cache Coherence ? Why does it occur ? Briefly discuss at least *two* techniques to overcome Cache Coherence problem. 5

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# 86075

## Master of Science (Computer Science)
## 1st Semester
## Examination – December, 2024

### DATABASE MANAGEMENT SYSTEM
#### Paper : 24CSC201DS05

*Time : Three Hours ]*                    *[ Maximum Marks : 50*

*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

प्रश्नों के उत्तर देने से पहले परीक्षार्थी यह सुनिश्चित कर लें कि उनको पूर्ण एवं सही प्रश्न-पत्र मिला है। परीक्षा के उपरान्त इस संबंध में कोई भी शिकायत नहीं सुनी जायेगी।

**Note :** Attempt *five* questions in all, selecting *one* question from each Unit. Question No. **1** is *compulsory*. All questions carry equal marks.

1. *Compulsory Questions :*

   (a) Differentiate between database schema and database state.                    2

(b) How primary key is different from unique key ? 2

(c) What is decomposition ? Name its properties used in normalization. 2

(d) When a transaction is said to follow two-phase locking protocol ? 2

(e) Differentiate between inner and outer join. 2

## UNIT – I

2. (a) Discuss three-schema architecture. Why mapping is needed among schema levels ? How do different schema definition languages support this architecture ? 5

(b) Discuss the simplified database system environment with graphical representation. 5

3. (a) What is ER Model ? Why it is known as conceptual model ? Explain the structural constraint applied in ER Model. 5

(b) How does a category different from a regular shared subclass ? What is a category used for ? Illustrate with example. 5

## UNIT – II

4. (a) What are three types of constraints that can be specified on a relation database ? 5

(b) What is relational calculus ? Discuss its different types with their expressive power. 5

5. (a) What is relational algebra ? Discuss unary and binary operations of relational algebra with example. 5

(b) What are materialized views ? How these can be created and deleted ? 5

## UNIT – III

6. (a) Why normalization is needed ? Explain various normal forms based on primary key with example. 5

(b) Discuss how serializability is used to enforce concurrency control in database systems. 5

7. (a) How BCNF is differ from 3NF ? Why is it considered a stronger form of 3NF ? 5

(b) What is transaction ? In what situation a transaction is said to be committed or aborted ? 5

## UNIT – IV

8. (a) Discuss wait-die would-wait protocols for deadlock prevention. 5

(b) What are range searching and pattern matching ? Give example also. 5

9. (a) What is a timestamp ? How does the system generate timestamps ?                                              5

   (b) How scalar functions are different from aggregate functions ? Discuss five string functions with their syntax.                                                          5

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# 86076

## Master of Science (Computer Science)
## 1st Semester
## Examination – December, 2024

### WEB DEVELOPMENT - I

### Paper : 24CSC201MV01

| Time : Three Hours ] | [ Maximum Marks : 35 |
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*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

प्रश्नों के उत्तर देने से पहले परीक्षार्थी यह सुनिश्चित कर लें कि उनको पूर्ण एवं सही प्रश्न-पत्र मिला है। परीक्षा के उपरान्त इस संबंध में कोई भी शिकायत नहीं सुनी जायेगी।

**Note :** Attempt *five* questions in all, selecting *one* question from each Unit. Question No. **1** is *compulsory*. All questions carry equal marks.

1. *Compulsory Questions :*

   (i) Define an intranet and explain how it differs from the Internet.

2

(ii) How can users customize their web browsers ?   2

(iii) Define XHTML and explain how it differs from HTML.   1½

(iv) What is XPath used for ?   1½

## UNIT – I

2. (a) What are the key components involved in connecting to the Internet ?   3

(b) What is the Domain Name System (DNS), and what role does it play in Internet navigation ?   4

3. Describe the importance of network setting such as IP address, subnet mask, and default gateway in configuring an Internet connection.   7

## UNIT – II

4. (a) Define HTTP. What are the differences between HTTP and HTTPS.   4

(b) What is a Uniform Resource Locator (URL) ? Break down its components and explain how they function together to locate resources on the web. 3

5. (a) Discuss the key features of instant messaing applications. How do they facilitate real-time communication among users ?   3

(b) Explain the functions of web-based chat rooms and discussion boards. How do they differ in terms of user interaction and content management ? 4

## UNIT – III

6. (a) How do you create an email link in HTML ? Explain the syntax and how it functions when clicked by a user. 4

(b) Describe how to set a background color for a webpage using HTML and CSS. What are the different methods to achieve this ? 3

7. What is a marquee in HTML ? Explain how to implement it and discuss its usability and accessibility considerations. 7

## UNIT – IV

8. (a) Explain the difference between inline, internal, and external CSS. Provide examples of each method of applying styles to a webpage. 3

(b) How do you link an external CSS file to an HTML document ? Describe the necessary HTML tag and its attributes. 4

**9.** (a) What are variables in Java Script ? Discuss the different ways to declare variables and the significance of variable scope. 3

(b) What is a Document Type Definition (DTD) ? Discuss its structure and purpose in XML. 4

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# 97541

## M. Sc. (Computer Science) 1st Semester Under CBCS Scheme (w.e.f. 2016-17 & 2021-22) Examination – December, 2024

### DISCRETE MATHEMATICS

### Paper : 16MCS21C1

**Time : Three Hours ]**      **[ Maximum Marks : 80**

*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

**Note :** Attempt *five* questions in all, selecting *one* question from each Unit. Question No. 1 is *compulsory*. All questions carry equal marks.

1.   (i)   Differentiate between proper and improper subset.      $8 \times 2 = 16$

   (ii)   Define path in the graph.

   (iii)   Symbolize the statement "All men are immortal".

# 97541

## M. Sc. (Computer Science) 1st Semester Under CBCS Scheme (w.e.f. 2016-17 & 2021-22) Examination – December, 2024

### DISCRETE MATHEMATICS

**Paper : 16MCS21C1**

Time : Three Hours ]                    [ Maximum Marks : 80

*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

**Note :** Attempt *five* questions in all, selecting *one* question from each Unit. Question No. 1 is *compulsory*. All questions carry equal marks.

1. (i) Differentiate between proper and improper subset.                    $8 \times 2 = 16$

   (ii) Define path in the graph.

   (iii) Symbolize the statement "All men are immortal".

97541- 450 -(P-4)(Q-9)(24)                    P. T. O.

(iv) Discuss about the term cardinality in set.

(v) Write down the applications of vein diagrams.

(vi) What is identity matrix ? Give suitable example.

(vii) Explain the term quantifiers in predicate calculus.

(viii) Write down the Demorgan's law in set.

## UNIT – I

2. (a) Define the term set and its various types. Explain different operations that can be performed on set with the help of suitable example.     10

   (b) There is a group of 48 students enrolled in Mathematics, French and Physics. Some students were more successful than others : 32 passed French, 27 passed Physics, 33 passed Mathematics; 26 passed French and Maths, 26 passed Physics and Maths, 21 passed French and Physics and 21 passed French, Maths and Physics. How many students passed one or more of the subjects ?     6

3. What do you mean by relation ? Explain different types of relation with suitable example. Also find out whether the given relation is equivalence relation or partial order relation.     16

(a) The relation $R$ on the set $A$ of all triangles in the plain defined by $R = \{(a, b) : \text{triangle } a \text{ is similar to triangle } b\}$

(b) The relation $R = \{a - b \text{ is divisible by } 5 \; \forall \; a, b \in I_+\}$

## UNIT – II

4. What do you mean by proposition? Give example. Explain the different types of connectors with their truth table.                                                   16

5. (a) Explain the term tautology, contingency and contradiction. Find out which is tautology, contingency or contradiction.

   (i)   $\sim(p \rightarrow q) \vee (\sim p \vee (p \wedge q))$

   (ii)  $p \vee (q \wedge r) \leftrightarrow [(p \vee q) \wedge (p \vee r)]$          10

   (b) Prove the following by mathematical induction
   $$1.2 + 2.3 + 3.4 + \dots + n\,(n+1) = \frac{n(n+1)(n+2)}{3}.\qquad 6$$

## UNIT – III

6. Solve the following step by step :                  $2 \times 8 = 16$

   (a) If $A = \begin{bmatrix} 1 & -2 & 3 \\ -4 & 2 & 5 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 3 \\ 4 & 5 \\ 2 & 1 \end{bmatrix}$, then show

   that $AB \neq BA$.

(b) Define matrix with the help of example. Also, explain the different types of matrices with the help of suitable example.

7. (a) Define the term determinant. Explain any *four* properties of determinant with supportive example. 8

(b) Solve the following linear equations $3x - 2y + 3z = 8$, $2x + y - z = 1$, $4x - 3y + 2z = 4$. 8

## UNIT – IV

8. Differentiate between the following : $2 \times 8 = 16$

(a) NDFA & DFA

(b) Mealy and Moore Machine

9. Write notes on the following : $2 \times 8 = 16$

(a) Chomsky Hierarchy

(b) Conversion of NDFA to DFA with suitable example.

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# 97542

## M. Sc. Computer Science 1st Semester Under CBCS Scheme (w. e. f. 2016-17 & 2021-22) Examination – December, 2024

### COMPUTER FUNDAMENTALS & PROGRAMMING IN C

#### Paper : 16MCS21C2

Time : Three Hours ]                    [ Maximum Marks : 80

*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

**Note :** Attempt *five* questions in all, selecting *one* question from each Unit. Question No. 1 is *compulsory*. All questions carry equal marks.

1. Answer the following questions briefly :      8 × 2 = 16

    (a) What is the difference between data and information ?

    (b) What is linker and loader ?

    (c) Explain break and continue statements in C.

    (d) What is else if ladder in C ?

    (e) Discuss size and dimension of an array in C.

(f) Explain pointer and its uses in C.

(g) Describe array of structure in C.

(h) Explain types of errors in C.

## UNIT – I

2. (a) What are input and output devices ? How these useful and used ? Explain *two* output and *one* input devices in detail.                    11

(b) Explain levels of programming languages with examples briefly.                                        5

3. Explain the following briefly with suitable examples.

(a) Operating system and its types and functions.    8

(b) Types of computers and their uses.                8

## UNIT – II

4. (a) What are pseudo codes and flowcharts ? How these are useful and used ? Explain these with examples.                                                8

(b) Explain logical, conditional and Bit-wise operators and their uses with C examples.                     8

5. Describe the following with examples in C.

(i) Looping statements and their uses                12

(ii) General Structure of a C program                 4

## UNIT – III

6. (a) Define function in C ? How is it used ? Explain its types, arguments passing and advantages with C code segments.                                          10

(b) Explain recursion and its advantages with examples in C. 6

7. Explain the following with C examples :

(a) Array of pointers and pointer to functions and their uses and advantages. 10

(b) String functions in C and their uses. 6

## UNIT – IV

8. (a) What is union and structure in C ? How these are implemented in C ? Explain their advantages and differences with examples in C. 10

(b) Explain six file handling functions with examples in C. 6

9. Explain the following briefly with C examples :

(i) Nesting of structures and pointer to structure. 8

(ii) Modes of files and command line arguments and their uses and applications. 8

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## 97544

# M. Sc. (Computer Science) 1st Semester Under CBCS Scheme (w.e.f. 2016-17 & 2021-22) Examination – December, 2024

## COMPUTER ORGANIZATION AND ARCHITECTURE

### Paper : 16MCS21C4

Time : Three Hours ]                    [ Maximum Marks : 80

*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

Note : Attempt *five* questions in all, selecting *one* question from each Unit. Question No. **1** is *compulsory*. All questions carry equal marks.

1. (a) What is De Morgan's Law ?                    2 × 8 = 16

   (b) What is memory hierarchy ?

   (c) What are register-reference instructions ?

   (d) What are array processors ?

   (e) What is the difference between flip-flop and latch ?

   (f) What is priority interrupt ?

(g) What is a bus ?

(h) What is DMA ?

## UNIT – I

2. (a) What is Multiplexer ? How does it work ? What are its applications ? Illustrate.    8

(b) Perform the operation $(A4.4B)_{16} - (25.4)_8 + (75.5)_{10}$ and find out the result in decimal number system.

   8

3. (a) What is a Shift register ? Design a 4-bit Shift register and explain its working.    8

(b) What is a Decoder ? Design a $3 \times 8$ decoder and explain its working.    8

## UNIT – II

4. (a) What is meant by an Instruction Set ? How an instruction is represented ? Also enumerate the factors which play important role for selection of an Instruction Set for a machine.    8

(b) What is an Instruction Cycle ? What are various sub-cycles in an Instruction Cycle ? Also outline the steps performed during each of these sub-cycles.    8

5. What are micro-operations ? What are its various types ? Illustrate the implementation of each category of micro-operations through its block diagram(s).    16

## UNIT – III

6. (a) How does RISC architecture differ from CISC ? Briefly discuss the main characteristics of RISC architecture. **8**

(b) What do you understand by Vector Processing ? State its significance and also enumerate certain applications which demand Vector Processing. **8**

7. (a) What is Pipelining ? When, where and why is it necessary ? Also differentiate between the Instruction Pipelining and Arithmetic Pipelining. **8**

(b) What are addressing modes ? What are different types of addressing modes ? Illustrate the use of these types. **8**

## UNIT – IV

8. (a) How does a Crossbar Switch interconnection structure differ from Multiport Memory interconnection structure ? Illustrate the difference through diagram(s). **9**

(b) Illustrate the difference between Parallel and Serial Interprocessor Arbitration techniques. **7**

9. (a) What is an Input/Output (I/O) Processor ? Outline the functions performed by an I/O Processor as well as illustrate the architecture for an I/O Channel. 8

(b) What is Cache Coherence ? Why does it occur ? Briefly discuss at least two techniques to overcome Cache Coherence problem. 8

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