2023

Time : 3 Hours
Full Marks : 80

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.
Answer from both the Groups as directed.

PART-A

(Compulsory)

Objective Type Question

1. Choose the correct answer of the following : (2×10=20)

(i) The collection of 8-bit is called as -

(a) Bytes

(b) Nible

(c) Word

(d) Record

(ii) Where is the decoded instruction stored?

(a) Register

(b) MDR

(c) PC

(d) IR

(iii) The status of bit is also called as

(a) Unsigned bit

(b) Signed bit

(c) Flag bit

(d) None of above

(iv) What does a computer bus line consist of ?

(a) Set of parallel lines

(b) Accumulators

(c) Registers

(d) None of above

(v) Which of the following building block can be used to implemant any combinational logic circuit?

(a) AND

(b) OR

(c) NAND

(d) None of above

(vi) Which of the following computer registar collects the result of the computation?

(a) Aceumulator

(b) Instruction Pointer

(c) Storage register

(d) None of above

(vii) In which of the following term the performance of cache memory meausred?

(a) Chart ratio

(b) Hit ratio

(c) Copy ratio

(d) Data ratio

(viii) Which of the following is a combinational logic circuit that change the binary information into N output lines?

(a) Multiplexer

(b) De Multiplexer

(c) Encoder

(d) Decoder

(ix) What does one thousand bytes represent?

(a) Kilo byte

(b) Mega byte

(c) Giga byte

(d) All of above

(x) Substraction in Computer's is caried out by :

(a) 1's Complement

(b) 2's Complement

(c) 3's Complement

(d) 9's Complement

PART-B

Long Answer Type Question

Answer any four questions of the following. (15×4=60)

2. What is demultiplexer? Explain with diagram.

3. What is computer architecture? Explain.

4. What are the different typpes of interupts in a micro processor system?

5. What is a snooping protocol?

6. What is DMA? Explain.

7. What are the steps involved in an instruction cycle?

8. What is the difference between interrupt service routine and subroutine?

9. What is RISC / SICS? Explain.

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GROUP-A

(Compulsory)

Objective Type Question

1. Choose the correct answer of the following : (2×10=20)

(i) If A and B are sets and $A \cup B = A \cap B$, then:

(a) $A = \Phi$

(b) $B = \Phi$

(c) A – B

(d) None of these

(ii) What is the cardinality of the set of odd positive integers less than 10?

(a) 10

(b) 5

(c) 3

(d) 20

(iii) Which of these is not a type of relation?

(a) Reflexive

(b) Surjective

(c) Symmetric

(d) Transitive

(iv) Which of the following relations is reflexive but not transitive for the set T = {7, 8, 9}?

(a) R = {(7,7), (8, 8), (9, 9)}

(b) R= {(7, 8), (8, 7), (8, 9}

(c) $R = \{0\}$

(d) $R = \{(7, 8), (8, 8), (8, N)\}$

(v) For any square matrix 4, AA^T is a

(a) Unit matrix

(b) Symmetric matrix

(c) Skew symmetric matrix

(d) Diagonal matrix

(vi) The matrix product $AB = O$, then

(a) $A = 0$ and $B = 0$

(b) A is null matrix

(c) $A = 0$ or $B = 0$

(d) None of these

(vii) If I is a unit matrix, then 3I will be

(a) A unit matrix

(b) A triangular matrix

(c) A scalar matrix

(d) None of these

(viii) What is the number of edges present in a complete graph having n vertices?

(a) (n*(n+1))/2

(b) (n*(n–1))/2

(c) n

(d) None of the above

(ix) A connected planar graph having 6 vertices, 7 edges contains ..... regions.

(a) 15

(b) 3

(c) 1

(d) 11

(x) A graph with all vertices having equal degree is known as a .....

(a) Multi Graph

(b) Regular Graph

(c) Simple Graph

(d) Complete Graph

GROUP-B

Long Answer Type Question

Answer any four questions of the following. (15×4=60)

2. Explain set operations with Venn diagram.

3. What is Graph? Define multi graph degree of directed and undirected graph? What is weighted graph?

4. Define Relation and its all types?

5. Solve the following linear equation by matrix inverse method.

$$10x + y + z = 12$$

$$2x + 10y + z = 13$$

$$x + y + 5z = 7$$

6. Prove that De-Morgan's Law.

   (a) $(A \cup B)' = A' \cap B'$

   (b) $(A \cap B)' = A' \cup B'$

7. Prove $(A \vee B) \wedge [(\neg A) \wedge (\neg B)]$ is a contradiction.

8. Explain about complete graph and planar graph with an example.

9. Write short notes on any two of the following :

   (i) Tautology

   (ii) Bi-partite graph

   (iii) Graph coloring

   (iv) Shortest path algorithm

   (v) Transitive relation

   (vi) Rank of matrices

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PART-A

(Compulsory)

Objective Type Question

1. Fill in the blanks with appropriate prepositions : (2×10=20)

   (i) The Lady was dressed _____ black. (in / for)

   (ii) Cows live _____ grass. (in / on)

   (iii) He is married _____ my sister. (to / of)

(iv) Sita writes _____ her left hand. (to / with)

(v) She is very careful _____ her health. (to / of)

(vi) He died _____ over-eating. (for / from)

(vii) This is different _____ the other. (to / from)

(viii) Your suggestion is helpful _____ us. (to / for)

(ix) His dress was made _____ silk. (from / of)

(x) We listen _____ the music (to / of)

PART-B

Long Answer Type Question

Answer any four questions of the following. (15×4=60)

2. Define General Etiquette? How does it influence on Interview Board?

3. Discuss the type of communication in detail with examples.

4. What are the main objectives of Business Letters?

5. Write a letter to the editor of the Times of India pointing out the lack of transport facilities for student and public in your area.

6. State leadership skills in chairing meetings.

7. Write a letter to the Registrar, J.N. University under the Right to Information Act seeking the details of Student Welfare Activities during academic year 2022-23.

8. Write short notes on any three of the following :

   (i) E-mail Messages

   (ii) Business Memos

   (iii) Verbal Communication

   (iv) Non-Verbal Communication

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PART-A

(Compulsory)

Objective Type Question

1. Choose the correct answer of the following : (2×10=20)

   (i) In Operating Systems, which of the following is / are CPU scheduling algorithms?

   (a) Round Robin

   (b) Shortest Job First

(c) Priority

(d) All of the mentioned

(ii) Caching .....

(a) Holds a copy of the data

(b) Is fast memory

(c) Holds the only copy of the data

(d) Holds output for a device

(iii) Which of the following is not the state of a process?

(a) New

(b) Old

(c) Waiting

(d) Running

(iv) If a process is executing in its critical section. then no other processes can be executing in their critical section. What is this condition called?

(a) Mutual exclusion

(b) Critical exclusion

(c) Synchronous exclusion

(d) Asynchronous exclusion

(v) Which one of the following is a synchronization tool?

(a) Thread

(b) Pipe

(c) Semaphore

(d) Socket

(vi) RPC provides a(an) ..... on the client-side, a separate one for each remote procedure.

(a) Stub

(b) Identifier

(c) Name

(d) Process identifier

(vii) Which scheduling algorithm allocates the CPU first to the process that requests the CPU first?

(a) First-come, first-served scheduling

(b) Shortest job scheduling

(c) Priority scheduling

(d) None of the mentioned

(viii) Which Disk scheduling Algorithm suffers from Starvation problem...

(a) FCFS

(b) SSTF

(c) SCAN

(d) LOOK

(ix) Swapping ..... be done when a process has pending I/O, or has to execute I/O operations only into operating system buffers.

(a) Must never

(b) Maybe

(c) Can

(d) Must

(x) Semaphore is a/an ..... to solve the critical section problem.

(a) Hardware for a system

(b) Special program for a system

(c) Integer variable

(d) None of the mentioned

PART-B

Long Answer Type Question

Answer any four questions of the following. (15×4=60)

2. Define Operating System. Discuss the functionalities of an operating system. Discuss different types of operating systems.

3. What is scheduler? Describe the short-term, medium term and long-term scheduler.

4. Explain inter process communication with example of producer consumer problem.

5. Explain the difference between multilevel queue scheduling and multilevel feedback queue scheduling.

6. Explain four conditions which are necessary to occur a deadlock.

7. Describe the paging memory management technique with address translation and relocation.

8. Consider the following set of processes with the length of the CPU-brust time in given ms :

Process	Burst Time	Arrival Time
P1	8	0
P2	4	1
P3	9	2
P4	5	3
P5	3	4

Draw four Gantt charts illustrating the execution of these processes using FCFS, SJF, priority and

RR (quantum=2) scheduling. Also calculate waiting time and turn around time for each scheduling algorithms.

9. Write short notes on any three of the following :

(a) Bus-Register

(b) LRU-Algorithm

(c) RISC and CISC

(d) Virtual memory

(e) TLB

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PART-A

(Compulsory)

Objective Type Question

1. Choose the correct answer of the following : (2×10=20)

(i) C Programming is a

~~(a)~~ High Level Language

(b) Middle Level Language

(c) Low Level Language

(d) Both (a) and (b)

(ii) The size of long double data type is

(a) 2 bytes

(b) 4 bytes

(c) 8 bytes

(d) 10 bytes

(iii) If int a=10, then what is the output of

printf ("%d", a++);

(a) 12

(b) 11

(c) 9

(d) 10

(iv) If a=5, then a%2=?

(a) 2

(b) 2.5

(c) 3

(d) 5

(v) Which one is not a keyword

(a) Area

(b) int

(c) float

(d) if

(vi) Whichone is a non-primitive data type

(a) int

(b) Array

(c) char

(d) float

(vii) How is an array initialized in C Language.

(a) int a[2]={5, 8};

(b) int a={5, 8};

(c) int a(2)={5, 8};

(d) int a{2}={5, 8};

(viii) Which of the folowing is sorting method.

(a) Linear Search

(b) Selection Sort

(c) Binary Search

(d) None of these

(ix) Exit Control loop is

(a) While loop

(b) do-while loop

(c) for loop

(d) All of them

(x) How to declare a single integer pointer in C

(a) int ** val

(b) int * val

(c) int *** val

(d) int val

PART-B

Long Answer Type Question

Answer any four questions of the following. (15×4=60)

2. Explain switch statements in details with suitable example.

3. What is loop construct? How many loops are in C Language? Explain each with examples.

4 Write a C program to check whether a number is prime or not.

5. What is an array? Write a program to find transpose of a matrix.

6. What is function? Write a program to add two numbers using function.

7. Differentiate between structure and union with suitable example.

8. Write a program for Binary Search.

9. Write short notes on any three of the following :

   (i) if statement

   (ii) Recursion

   (iii) Pointer

   (iv) String

   (v) File Handling.

D
b
b
C
D
A
C
C
D
C

2023

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GROUP-A

(Compulsory)

Objective Type Question

1. Choose the correct answer of the following : (2×10=20)

   (i) Which is not a protocol?

   (a) SMTP

   (b) Tel-Net

(c) FTP

(d) Ethernet

(ii) WAN stands for

(a) Wap Area Network

(b) Wide Area Network

(c) Wide Array Net

(d) Wireless Area Network

(iii) Which language computer understands without any translation?

(a) Natural Language

(b) Machine Language

(c) Programming Language

(d) Assembly Language

(iv) ASCII stands for

(a) American Stable Code for International Interchange

(b) American Standard Case for Institutional Interchange

(c) American Standard Code for Information Interchange

(d) American Standard Code for Interchange Information

(v) Microprocessors as switching devices are for which generation computers

(a) First Generation

(b) Second Generation

(c) Third Generation

(d) Fourth Generation

(vi) Which is not an Internet Browser?

(a) Netscape Navigator

(b) Internet Explorer

(c) G-mail

(d) Google Chrome

(vii) A computer program that converts an entire program into machine language is called

(a) Interpreter

(b) Simulator

(c) Compiler

(d) Commander

(viii) Decimal value of 110010 is

(a) 50

(b) 25

(c) 10

(d) 52

(ix) Which of the following groups consist of only output devices?

(a) Scanner, Pritner, Monitor

(b) Keyboard, Pritner, Monitor

(c) Mouse, Printer, Monitor

(d) Plotter, Printer, Monitor

(e) None of these

(x) The two kinds of main memory are :

(a) Primary and secondary

(b) Random an sequential

(c) ROM and RAM

(d) All of above

GROUP-B

Long Answer Type Question

Answer any four questions of the following. (15×4=60)

2. Explain Block Structure of Computer System with diagram? Also write the 10 major Characteristics of Computer System.

3. Define Programming Language? Differentiate between Machine language, Assembly language & High Level Language.

4. Define computer networks? Discuss various types of networks topologies in computer network.

5. How Does the Internet Work? Explain advantages and disadvantages of the Internet in details.

6. Perform any three operations :

   (a) Find out the decimal equivalent of 11010111

   (b) Convert to decimal number 2A3B16

   (c) Convert to binary equivalent 5628

   (d) Convert to 1048 to Hexa format.

7. Differentiate between the characteristics of primary and secondary storage of a computer system?

8. (a) Explain the principle and working of laser printers?

   (b) What is system software? Give five examples.

9. Write short notes on any three :

(i) TELNET

(ii) FTP

(iii) IP Address

(iv) System Software

(v) TCP/IP