



CSC 203

B.Sc. IVth SEMESTER EXAMINATION, 2024-25

COMPUTER SCIENCE

(Computer System Architecture)

AFFIX PRESCRIBED
RUBBER STAMP

Paper ID

(To be filled in the
OMR Sheet)

Date (तिथि) : _____

5377

अनुक्रमांक (अंकों में) :

Roll No. (In Figures) :

अनुक्रमांक (शब्दों में) :

Roll No. (In Words) : _____

Time : 1:30 Hrs.

समय : 1:30 घण्टे

Max. Marks : 75

अधिकतम अंक : 75

नोट : पुस्तिका में 50 प्रश्न दिये गये हैं, सभी प्रश्न करने होंगे। प्रत्येक प्रश्न 1.5 अंक का होगा।

Important Instructions :

1. The candidate will write his/her Roll Number only at the places provided for, i.e. on the cover page and on the OMR answer sheet at the end and nowhere else.
2. Immediately on receipt of the question booklet, the candidate should check up the booklet and ensure that it contains all the pages and that no question is missing. If the candidate finds any discrepancy in the question booklet, he/she should report the invigilator within 10 minutes of the issue of this booklet and a fresh question booklet without any discrepancy be obtained.

महत्वपूर्ण निर्देश :

1. अभ्यर्थी अपने अनुक्रमांक केवल उन्हीं स्थानों पर लिखेंगे जो इसके लिए दिये गये हैं, अर्थात् प्रश्न पुस्तिका के मुख्य पृष्ठ तथा साथ दिये गये ओ०एम०आर० उत्तर पत्र पर, तथा अन्यत्र कहीं नहीं लिखेंगे।
2. प्रश्न पुस्तिका मिलते ही अभ्यर्थी को जाँच करके सुनिश्चित कर लेना चाहिए कि इस पुस्तिका में पूरे पृष्ठ हैं और कोई प्रश्न छूटा तो नहीं है। यदि कोई विसंगति है तो प्रश्न पुस्तिका मिलने के 10 मिनट के भीतर ही कक्ष परिप्रेक्षक को सूचित करना चाहिए और बिना त्रुटि की दूसरी प्रश्न पुस्तिका प्राप्त कर लेना चाहिए।

1. What does SIMD stand for in computer architecture ?
 - (A) Single Input Multiple Drive
 - (B) Single Input Multiple Data
 - (C) Single Instruction Multiple Drive
 - (D) Single Instruction Multiple Data

2. Equivalent of the decimal number $(25.375)_{10}$ in binary form :
 - (A) 11001.011
 - (B) 11101.011
 - (C) 11011.111
 - (D) 11001.101

3. Which register in the CPU stores the address of the next instruction to be fetched ?
 - (A) Instruction Register
 - (B) Program Counter
 - (C) Accumulator
 - (D) None of the above

4. Find the 2's complement of 11001?
 - (A) 00101
 - (B) 01010
 - (C) 11100
 - (D) 00111

5. The number $(2217)_8$ is equivalent to Hexadecimal form :
 - (A) 608
 - (B) 28F
 - (C) 48F
 - (D) 2297

6. If a signal passing through a gate is inhibited by sending a low into one of the input and the output is high the gate is :
- (A) NOR
 - (B) NAND
 - (C) AND
 - (D) OR
7. How many possible output combination exist for a 3-input logic gate ?
- (A) 4
 - (B) 6
 - (C) 8
 - (D) 16
8. The primary function of the control unit is to :
- (A) Perform calculations
 - (B) Store data permanently
 - (C) Manage and coordinate all computer operations
 - (D) Convert analog signals to digital
9. What is the role of the bus in a computer system ?
- (A) Process data
 - (B) Store instructions
 - (C) Transfer data between components
 - (D) Display output to users
10. The system bus in a computer typically consists of :
- (A) Only the data bus
 - (B) Only the address bus
 - (C) Only the control bus
 - (D) Data bus, address bus and control bus

11. Which type of bus is bidirectional in nature ?
- (A) Address bus
 - (B) Control Bus
 - (C) Data Bus
 - (D) System Bus
12. In Von Neumann architecture the program and data share :
- (A) Separate memory units
 - (B) The same memory unit
 - (C) Different buses
 - (D) Only external storage
13. What are the main components of a computer architecture ?
- (A) CPU, Memory, Input / Output devices
 - (B) Keyboard, Mouse, Monitor
 - (C) RAM, Hard Disk, Printer
 - (D) Operating System, Applications software
14. What happens if the bus speed of a system is increased ?
- (A) The system performance improves
 - (B) The storage capacity increases
 - (C) The CPU speed decreases
 - (D) The number of input/output ports increases
15. Which units of the computer interacts directly with the user ?
- (A) Input unit
 - (B) Output unit
 - (C) Memory unit
 - (D) Control unit

16. Which gate provides an output that is the complement of the OR gate ?
- (A) AND
 - (B) NOR
 - (C) XOR
 - (D) NAND
17. What is the output of an XOR gate when both input are the same ?
- (A) 1
 - (B) 0
 - (C) Depends on the input values
 - (D) Cannot be determined
18. Which logic gate is also known as an inverter ?
- (A) AND
 - (B) NOR
 - (C) NOT
 - (D) XOR
19. How many minimum number of bits required to represent 38 distinct numbers ?
- (A) 3
 - (B) 4
 - (C) 6
 - (D) 5
20. What is the purpose of registers in a CPU ?
- (A) To store frequently used data and instructions for quick access
 - (B) To provide long term data storage
 - (C) To manage Input / Output operations
 - (D) To connect the CPU with external devices

21. Which type of memory is non-volatile and used for long term storage ?
- (A) RAM
 - (B) ROM
 - (C) Cache Memory
 - (D) Hard Disk
22. What does the term "pipeline" refer to in computer architecture ?
- (A) Concurrent execution of multiple instructions
 - (B) A sequence of logic gates
 - (C) Data flow between CPU and RAM
 - (D) A type of CPU cooler
23. Which addressing mode allows direct access to memory locations without calculating the address ?
- (A) Indexed Addressing
 - (B) Indirect Addressing
 - (C) Immediate Addressing
 - (D) Direct Addressing
24. Find the 9's complement of 2345 ?
- (A) 7832
 - (B) 6231
 - (C) 7654
 - (D) 5386
25. What does RISC stand for in the context of CPU design ?
- (A) Rapid Integrated System
 - (B) Real-time Instruction Set
 - (C) Random Integrated System
 - (D) Reduced Instruction Set Computer

26. Which type of memory is used to store the BIOS in a computer system ?
- (A) ROM
 - (B) RAM
 - (C) Cache Memory
 - (D) Virtual Memory
27. What is the purpose of a cache memory in a computer system ?
- (A) Run background process
 - (B) Maintain file system integrity
 - (C) Execute machine instructions
 - (D) Store frequently accessed data for quick retrieval
28. What does the term "clock speed" indicate in the context of CPU performance ?
- (A) Rate of data transfer
 - (B) Size of cache memory
 - (C) Number of cores
 - (D) Speed at which instruction are executed
29. Find the 10's complement of 21100 ?
- (A) 65100
 - (B) 38692
 - (C) 16680
 - (D) 78900
30. Which bus carries memory address that the CPU generates during the execution of a program ?
- (A) Address Bus
 - (B) System Bus
 - (C) Data Bus
 - (D) Control Bus

31. Which type of memory is volatile and loses its contents when the power is turned off ?
- (A) Cache Memory
 - (B) RAM
 - (C) Hard Disk
 - (D) None of the above
32. What is the purpose of the Memory Management Unit in a computer system ?
- (A) Executes system utilities
 - (B) Monitors CPU temperature
 - (C) Maps logical addresses to physical addresses
 - (D) Allocated RAM efficiently
33. What is the purpose of virtual memory ?
- (A) Increase CPU speed
 - (B) Expand RAM virtually
 - (C) Reduce power consumption
 - (D) Improve hard disk performance
34. Which cache memory mapping technique allows any main memory block to be placed in any cache location ?
- (A) Virtual Mapping
 - (B) Set-Associative Mapping
 - (C) Direct Mapping
 - (D) Fully Associative Mapping
35. Which type of memory is used to store intermediate results and data within the CPU ?
- (A) ROM
 - (B) RAM
 - (C) Cache Memory
 - (D) Registers

36. In a computer system what does the term "DMA" stand for ?
- (A) Data Manipulation Algorithm
 - (B) Direct Memory Access
 - (C) Digital Media Adapter
 - (D) None of the above
37. Which type of instruction execution allows multiple instruction to be processed simultaneously ?
- (A) Parallel Execution
 - (B) Sequential Execution
 - (C) Superscalar Execution
 - (D) Pipeline Execution
38. What does the term "instruction set architecture" define in computer architecture ?
- (A) Rate of data transfer
 - (B) Size of cache memory
 - (C) Set of instruction that a CPU can execute
 - (D) A type of CPU cooler
39. Which type of memory is used to store data temporarily during program execution ?
- (A) ROM
 - (B) Cache Memory
 - (C) RAM
 - (D) Hard Disk
40. Which of the following architecture is used for deep learning and AI processing ?
- (A) CPU
 - (B) FPGA
 - (C) GPU
 - (D) Microcontroller

41. Which I/O technique is used when the CPU continuously checks the status of an I/O device ?
- (A) Polling
 - (B) Interrupt driven
 - (C) DMA
 - (D) Memory mapped I/O
42. Which memory organization allows multiple processes to share the same physical memory ?
- (A) Paging
 - (B) Cache Memory
 - (C) Registers
 - (D) Flash Memory
43. Which of the following is an advantage of segmentation over paging ?
- (A) No fragmentation
 - (B) Logical division of memory
 - (C) Faster access time
 - (D) Larger memory size
44. What is the main advantage of Harvard architecture over Von Neuman architecture ?
- (A) Uses a single bus
 - (B) Uses separate memory for data and instruction
 - (C) Is slower but more efficient
 - (D) Has no control unit
45. What is the primary advantage of using Direct Memory Access ?
- (A) It reduces CPU workload
 - (B) It increases memory size
 - (C) It speeds up instruction execution
 - (D) It reduce power consumption

46. Which memory mapping technique is most flexible but costly ?
- (A) Direct Mapping
 - (B) Associative Mapping
 - (C) Set-Associative Mapping
 - (D) Hierarchical Mapping
47. What is the main advantage of multi-level cache in modern processors ?
- (A) It increases CPU clock speed
 - (B) It reduces power consumption
 - (C) It reduces memory access latency
 - (D) It increases the number of cores
48. Which register is responsible for holding the instruction that is currently being executed ?
- (A) Accumulator
 - (B) Instruction Register (IR)
 - (C) Stack Pointer (SP)
 - (D) Program Counter (PC)
49. What is the role of the instruction decoder in the CPU ?
- (A) Execute arithmetic operations
 - (B) Decode and interpret instructions
 - (C) Fetch data from memory
 - (D) Manage input/output operations
50. Which Input / Output converts digital signals to analog ?
- (A) ADC
 - (B) DAC
 - (C) Register
 - (D) Bus Controller
