Roll No. .....

E–356

M. Sc. (IT) (First Semester)

EXAMINATION, Dec.-Jan., 2020-21

Paper Fourth

COMPUTER SYSTEM ARCHITECTURE

[MSC (IT)—104]

Time : Three Hours] [*Maximum Marks : 100*

[*Minimum Pass Marks : 40*

Note : Attempt all Sections as directed.

Section—A 1 each

(Objective/Multiple Choice Questions)

Note : Attempt all questions.

Choose the correct answer :

1. Floating point representation is used to store :

   (a) Boolean value

   (b) Whole number

   (c) Real integers

   (d) Integer

2. In computers, subtraction is generally carried out by :

   (a) 9's complement

   (b) 10's complement

   (c) 1's complement

   (d) 2's complement

3. The circuit used to store one bit of data is known as :

   (a) Register

   (b) Encoder

   (c) Decoder

   (d) Flip-Flop

4. $(2FAOC)_{16}$ is equivalent to :

   (a) $(195084)_{10}$

   (b) $(001011111010\ 0000\ 1100)_2$

   (c) Both (a) and (b)

   (d) None of the above

5. In signed-magnitude binary division, if the dividend is $(11100)_2$ and divisor is $(10011)_2$, then the result is :

   (a) $(00100)_2$

   (b) $(10100)_2$

   (c) $(11001)_2$

   (d) $(01100)_2$

6. Cache memory works on the principle of :

   (a) Locality of data

   (b) Locality of memory

   (c) Locality of reference

   (d) Locality of reference and memory

7. A three input NOR gate gives logic high output only when :

   (a) One input is high

   (b) One input is low

   (c) Two input are low

   (d) All input are high

8. A floating point number that has a 0 in MSB of mantissa is said to have :

   (a) overflow

   (b) underflow

   (c) important number

   (d) undefined

9. Logic gates with a set of input and output is arrangement of :

   (a) Combinational circuit

   (b) Logic circuit

   (c) Design circuit

   (d) Register

10. A page fault :

    (a) Occurs when there is an error in a specific page

    (b) Occurs when a program accesses a page of main memory

    (c) Occurs when a program accesses a page not currently in main memory

    (d) Occurs when a program accesses a page belonging to another program

11. Pipeline implement :

    (a) Fetch instruction

    (b) Decode instruction

    (c) Fetch operand

    (d) Calculate operand

12. Which of the following is not a weighted code ?

    (a) Decimal number system

    (b) Excess-3 code

    (c) Binary number system

    (d) None of the above

13. The addressing mode used in an instruction of the form ADD XY, is :

    (a) Absolute

    (b) Indirect

    (c) Index

    (d) None of the above

14. Don't care conditions can be used for simplifying boolean expression in ..... .

    (a) Registers

    (b) Terms

    (c) K-maps

    (d) Latches

15. The DMA transfer is initiated by ..... .

    (a) Processor

    (b) The process being executed

    (c) I/O devices

    (d) OS

16. The boolean expression of an EXOR gate is ..... .

    (a) $AB+$

    (b) $A+$

    (c) $A' +$

    (d) $A'+$

17. If a system is 64 bit machine, then the length of each word will be .....

    (a) 4 bytes

    (b) 8 bytes

    (c) 16 bytes

    (d) 12 bytes

18. What is correct instruction if you want the control to go to the location 2000h ?

    (a) MOV 2000h

    (b) MOV A, 2000h

    (c) JMP 2000h

    (d) RET 2000h

19. The binary information of source register is chosen by :

    (a) Demultiplexer

    (b) Multiplexer

    (c) Both (a) and (b)

    (d) None of the above

20. Shift left is equal to :

    (a) Multiply by two

    (b) Add by two

    (c) Divide by two

    (d) Subtract by two

Section—B 2 each

(Very Short Answer Type Questions)

Note : Attempt all questions. Write answer using **2-3** sentences.

1. Convert $(2F59)_{16}$ into decimal number.
2. Perform the binary arithmetic operation :

$$(1000100)_2 - (1010100)_2.$$

3. Explain fixed-point representation.
4. Explain Microprocessor.
5. What is SMPs ?
6. Explain program counter.
7. Explain Hit ration.
8. Explain virtual memory.
9. Explain asynchronous serial transfer.
10. What is Direct Mapping ?

Section—C 3 each

(Short Answer Type Questions)

Note : Attempt all questions. Answer precisely using < **75** words.

1. Subtract by 2's complement method : 111001 – 101010.
2. State and prove De Morgan's theorem.
3. Explain error detection and correction codes.
4. Explain motherboard and SMPs.
5. Simplify function : $X = (B + C)(B' \quad \vdash D)$.
6. Explain CPU organization.
7. Explain I/O processor.
8. What are different types of magnetic memories ?
9. Explain the concept of hand shaking.
10. Explain Cache and Associative memory.

Section—D 6 each

(Long Answer Type Questions)

Note : Attempt all questions. Answer precisely using **150** words.

1. What is Flip-Flop ? Explain the working of J-K Flip-Flop.
2. Explain memory hierarchy. Differentiate between address and memory space.
3. Explain various modes of data transfer. Discuss handshaking and asynchronous serial data transfer using example.
4. Explain various addressing modes and its types.
5. What are various types of semiconductor memories ? Explain with example. Discuss their merits, demerits and areas of application.