

2021

(CBCS)
(5th Semester)
ELECTRONICS

SEVENTH PAPER
[Computer Fundamentals]

Full Marks: 75
Time: 2 hours

INSTRUCTIONS TO CANDIDATES

(Please read the instructions carefully before you start writing your answers)

1. Questions should be attempted as per instructions.
2. Do not copy the Questions. Indicate the Section and Question No. clearly while attempting the answer.
3. For Multiple choice answers, candidate should indicate the Question No., Sub. No., (if any) and the correct answer. For example :

1. *Name the State capital of Mizoram.*

(a) *Lunglei*

(b) *Aizawl*

(c) *Champhai*

Candidate should provide answer as—Q. No. 1 : (b) *Aizawl*
[Candidate should avoid writing only (b)]

4. Section B - Answer to Short Answer should be limited to **One Page** only.
5. The figures in the margin indicate full marks for the questions.

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SECTION : A – OBJECTIVE
(Marks: 30)

Choose the correct answer from the following: 1x30=301.

1. The binary system uses powers of for positional values.
 - (a) 2
 - (b) 10
 - (c) 8
 - (d) 16

2. Which of the following Binary numbers is equivalent to decimal 24
 - (a) 1101111
 - (b) 11000
 - (c) 111111
 - (d) 11001

3. Name the number system which uses alphabet as well as numerals
 - (a) Binary
 - (b) Octal number system
 - (c) Decimal number system
 - (d) Hexadecimal number system

4. The parity of the Binary number system 100110011
 - (a) is even
 - (b) is odd
 - (c) 4
 - (d) 8

5. The string of 8 bits is known as
 - (a) Nibble
 - (b) Byte
 - (c) Octed
 - (d) Quad

6. Convert the binary 10101 to its decimal equivalent
 - (a) 21
 - (b) 12
 - (c) 22
 - (d) 31

7. Different variables used in Boolean algebra can have values of
 - (a) 0 or 1
 - (b) low or high
 - (c) true or false
 - (d) ON or OFF

8. The given Boolean expression is $Y = A\bar{B} + B\bar{A}$. If $A = 1$ and $B = 1$. then $Y =$
 - (a) 1
 - (b) 0
 - (c) either 1 or 0
 - (d) 10

9. In Boolean algebra, the plus sign (+) indicates.....
 - (a) AND operation
 - (b) OR operation
 - (c) NOT operation
 - (d) XOR operation

10. $\overline{(A + B)} = \dots\dots\dots$
 - (a) $\bar{A} + \bar{B}$
 - (b) $\bar{A} - \bar{B}$
 - (c) $\bar{A} \cdot \bar{B}$
 - (d) $\overline{A \cdot B}$

11. The NAND gate is AND gate followed by
(a) NOT gate
(b) OR gate
(c) AND gate
(d) XOR gate
12. $A + A.B = \dots\dots\dots$
(a) B
(b) A
(c) $\bar{A} + B$
(d) AB
13. When reset is high and set is low in a NOR D-latch then the output will be
(a) No change
(b) High
(c) Low
(d) Invalid
14. _____ is an example for combinational circuit
(a) Flip flop
(b) Register
(c) Multiplexer
(d) Counter
15. The flip flop is a _____ device
(a) Unstable
(b) Bi-stable
(c) Both a and b
(d) Uni-Stable
16. The set-reset flip flops constructed by cross-coupling of _____ gates
(a) AND or NAND
(b) NAND or NOR
(c) XNOR or NOR
(d) NOT or OR
17. How many bits of information do flip-flop store?
(a) One-bit
(b) Ten-bit
(c) Two-bit
(d) Three-bit

18. How many of states are there in a 2 bit counter?
- (a) One
 - (b) Sixteen
 - (c) Eight
 - (d) Four
19. In which of the following storage devices recording is done by burning tiny pits on a circular disk?
- (a) Punched card
 - (b) Floppy disk
 - (c) Optical disk
 - (d) Magnetic tape
20. Which of the following is the largest unit of storage?
- (a) Gigabyte (GB)
 - (b) Kilobyte (KB)
 - (c) Megabyte (MB)
 - (d) Terabyte (TB)
21. The magnetic tape is generally a plastic ribbon coated with _____
- (a) Magnesium oxide
 - (b) Chromium dioxide
 - (c) Zinc oxide
 - (d) Copper oxide
22. Which of the following is the correct representation for a storage capacity of a tape?
- (a) Data recording density = Storage capacity
 - (b) Length = Storage capacity
 - (c) Storage capacity = Length x data recording density
 - (d) Storage capacity = Length + data recording density
23. The disk's surface is divided into a number of invisible concentric circles called:
- (a) Drives
 - (b) Tracks
 - (c) Slits
 - (d) References

24. Rotation of the disk must vary _____ with the radius of the disk.
- (a) directly
 - (b) accordingly
 - (c) concurrently
 - (d) inversely
25. Input or output devices that are connected to computer are called _____.
- (a) Input/Output Subsystem
 - (b) Peripheral Devices
 - (c) Interfaces
 - (d) Interrupt
26. How many types of modes of I/O Data Transfer?
- (a) 3
 - (b) 2
 - (c) 4
 - (d) 5
27. The method which offers higher speeds of I/O transfers is _____
- (a) Interrupts
 - (b) Memory mapping
 - (c) Program-controlled I/O
 - (d) DMA
28. In memory-mapped I/O, _____ .
- (a) the I/O devices have a separate address space
 - (b) the I/O devices and the memory share the same address space
 - (c) a part of the memory is specifically set aside for the I/O operation
 - (d) the memory and I/O devices have an associated address space
29. The method of accessing the I/O devices by repeatedly checking the status flags is
- (a) Program-controlled I/O
 - (b) Memory-mapped I/O
 - (c) I/O mapped
 - (d) DMA

30. The method of synchronising the processor with the I/O device in which the device sends a signal when it is ready is
- (a) Exceptions
 - (b) Signal handling
 - (c) Interrupts
 - (d) DMA

SECTION : B – SHORT ANSWER

(Marks : 45)

Answer the following questions in not more than 1 (one) page each, choosing 3 (three) questions from each unit. 3x15=45

UNIT I

1. Perform the 2's complemental subtraction of the following binary numbers
(i) $10110_2 - 11010_2$ (ii) $10101_2 - 00111_2$
2. Perform division of the following binary numbers:
(i) $1001011_2 \div 11_2$ (ii) $11010_2 \div 101_2$
3. Explain in brief the working principle of Binary Weight Resistor Digital to Analog converter.
4. Write short notes on Digital Voltmeter.

UNIT II

5. What are NOR and NAND gates? Why are they called universal gates?
6. Discuss OR gate operation. Draw the schematic diagram of 2-input OR gate. Give its truth table.
7. State and Prove De Morgan's Second theorem.
8. Prove the following Boolean identity.

$$(A+B)(A+\bar{B})(\bar{A}+C) = AC$$

UNIT III

9. Write six differences between Combinational circuit and Sequential circuit
10. What is flip flop? Explain RS NAND gate latch with the truth table.
11. Explain shift left Register using D-flip flop.
12. Discuss the working principle of an Asynchronous or Ripple Counter.

UNIT IV

13. Differentiate between PROM and EPROM
14. Write advantages and limitations of magnetic tapes as a secondary storage device.
15. Explain how data is stored and organized on a magnetic disk.
16. How a system records/reads data on/from an optical disk.

UNIT V

17. What is DMA? Explain briefly how the DMA controller works?
18. Draw the flow chart of programmed I/O and write the three instructions for the transfer of each byte.
19. State and explain the four types of I/O commands.
20. Explain Strobe Control method of Asynchronous data transfer.

***** End of question *****