

DAY - **18**

SEAT NUMBER

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2020

III

13

1100

V - 267

(E)

**ELECTRONICS
PAPER - II (C-2)**

Time : 3 Hours**4 Pages****Max. Marks : 50**

- Instructions :** (1) All questions are compulsory.
(2) Draw neat labelled diagrams wherever necessary.
(3) Figures to the right indicate full marks.
(4) Use of log tables is allowed.

1 (A) Select correct alternatives from the following sub-questions and rewrite the complete sentences

(a) The radix of decimal number system is _____

1

- (i) 2
- (ii) 8
- (iii) 10
- (iv) 16

(b) The bubbled OR gate is equivalent to _____ gate.

1

- (i) NAND
- (ii) NOR
- (iii) NOT
- (iv) AND

(c) In _____ analog to digital converter SAR is used.

1

- (i) Simultaneous
- (ii) Counter
- (iii) Successive Approximation
- (iv) Continuous

(d) _____ memory improve the overall performance of a computer.

- (i) Magnetic Core
- (ii) Cache
- (iii) Magnetic Tape
- (iv) Floppy Disk

(B) Attempt **any two** of the following .

- (a) What is a full Adder ? **Explain its working** with logic diagram and truth table. 3
- (b) Explain the working of 1:4 Demultiplexer with logic diagram. 3
- (c) How many Flip-flops are required to **construct each** of the following counters : 3

- (i) MOD - 10 Counter
- (ii) MOD - 20 Counter
- (iii) MOD - 100 Counter

2 (A) Attempt **any two** of the following 3

(a) Convert **the following** .

- (i) $[11001.101]_2 = [\text{---}]_{10}$
- (ii) $[10111]_2 = [\text{---}]_{10}$
- (iii) $[2AF]_{16} = [\text{---}]_2$

(b) Implement the following logic expression using Multiplexer. 3

$$f(A, B, C, D) = \sum m (1, 2, 5, 8, 9, 13, 15)$$

(c) Write comparison between Primary Memory and Secondary Memory. 3

(B) Attempt **any one** of the following .

(a) Draw the block diagram of Mod-16 counter and explain its working with truth table. 4

(b) Draw the block diagram of Digital Computer. And explain the function of each block. 4

3. (A) Attempt **any two** of the following
- (a) Perform the following subtraction of Binary number's using 2's complement method 3
 - (i) $11011 - 10100$
 - (ii) $1010 - 1110$
 - (b) What is 'T' Flip-flop ? Why it is known as 'divide by 2 circuit' ? 3
 - (c) What will be the output voltage of 4-bit R-2R ladder type DAC corresponding to the binary inputs 3
 - (i) 1000
 - (ii) 0100

Given Logic '0' = 0V
Logic '1' = 10V

(B) Attempt **any one** of the following

- (a) State and prove De-morgan's theorems. Draw logic diagram.
- (b) Explain working of decimal to BCD Encoder by using 4-OR gates with the help of circuit diagram.

4. (A) Attempt **any two** of the following

- (a) Write a note on BCD Code. State its advantages and disadvantages 3
- (b) Explain basic gates with their definition, truth table and symbols. 3
- (c) With a neat circuit diagram, explain, how will you use IC 7446 as a BCD to seven Segment Decoder in drive seven segment LED display ? 3

(B) Attempt **any one** of the following

- (a) Draw the circuit of TTL NAND gate and explain its working. Give importance of totem pole stage. <https://www.maharashtrastudy.com> 4
- (b) Explain the working of master - slave JK Flip-flop. 4

5. (A) Attempt **any two** of the following :

- (a) Define :
 - (i) Power Dissipation
 - (ii) Fan In and Fan Out
 - (iii) Figure of Merit
- (b) Explain the working of BCD to Decimal decoder.
- (c) Explain clear and preset facility in Flip-flop.

(B) Attempt **any one** of the following .

(a) What do you mean by :

4

(i) LSB

(ii) MSB

(iii) Nibble

(iv) Byte

(b) What is Multiplexer ? Obtain 8:1 multiplexer using two 4:1 multiplexer 4

OR

5 (A) Attempt **any two** of the following

(a) Explain the basic CKT of CMOS Inverter. 3

(b) What is Parallel Counter (Synchronous) ? Write its two advantages. 3

(c) Explain the working of Successive approximation A/D converter. 3

(B) Attempt **any one** of the following

(a) Prove the following identities using boolean laws 4

(i) $ABC + A\bar{B}C + AB\bar{C} = A(B + C)$

(ii) $(A + B)(A + C) = A + BC$

(b) Explain the working of Weighted Resistor DAC ? State its drawbacks. 4

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