DAY - 18 SEAT NUMBER | | | | | | |

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. 1

(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 constrict 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 :

(a) Convert the following : 3

(i) $[11001{\cdot}101]_2 = [\text{——}]_{10}$

(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' = OV

Logic '1' = 10V

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

(a) State and prove De-morgan's theorems. Draw logic diagram. 4

(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. 4

(b) Explain the working of master - slave JK Flip-flop. 4

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

(a) Define : 3

(i) Power Dissipation

(ii) Fan In and Fan Out

(iii) Figure of Merit

(b) Explain the working of BCD to Decimal decoder. 3

(c) Explain clear and preset facility in Flip-flop. 3

(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) $ABC + A\overline{B}C + AB\overline{C} = A\,(B + C)$

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

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