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Total No. of Pages : 02

Total No. of Questions : 09

**B.Tech. (Artificial Intelligence (AI) and Data Science / CSE /
(CSE)(AI&ML) /(CSE)(Data Science) /(CSE)(IOT)/(Data Science)/ IT / CSE
(Internet of Things and Cyber Security including Block Chain
Technology)) (Sem.-3)**

DIGITAL ELECTRONICS

Subject Code : BTES301-18

M.Code : 76435

Date of Examination : 24-05-2023

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A** is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. **SECTION-B** contains **FIVE** questions carrying **FIVE** marks each and students have to attempt any **FOUR** questions.
3. **SECTION-C** contains **THREE** questions carrying **TEN** marks each and students have to attempt any **TWO** questions.

SECTION-A

1. Write briefly :

- a) What is the need of digital electronics? Discuss.
- b) List the various disadvantages of Boolean algebra.
- c) Differentiate between combinational and sequential circuits.
- d) What is the need of a flip flop? Discuss.
- e) What do you mean by MUX? Discuss.
- f) What do you mean by excitation table? Discuss.
- g) What do you mean by race around condition? Discuss.
- h) Discuss the significance of D flip-flop.
- i) Write down the need of sample and hold circuit.
- j) What do you mean by memory cycle? Discuss.

SECTION-B

2. Implement the half adder using :
 - a) AOI
 - b) NAND gates only .
3. In an industry four operations Temperature, Pressure, Level and Humidity are to be encoded. Design a priority encoder in which Temperature must have the highest priority then Pressure followed by Level and Humidity is having the lowest priority.
4. Explain the working of a JK flip-flop. Also, discuss how the problem of SR flip flop is solved in JK flip flop?
5. Draw the diagram and discuss the working of R-2R type D/A converter in detail.
6. Explain the ROM organization and its comparison with RAM.

SECTION-C

7. Draw and explain the working of Successive approximation and dual slope A/D converters.
8.
 - a) Reduce the following expression to simplest form using K map method $F(A,B,C,D) = \sum m (0,2,5,6,7,10,11,12)$
 - b) Draw the logical diagram and explain the working of BCD adder.
9. **Explain :**
 - a) FPGA
 - b) Gray and Excess 3 codes

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.