| Seat No. | |
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**[5668]-135**

**S.E. (E&TC/Electronics) (First Semester) EXAMINATION, 2019**

**DIGITAL ELECTRONICS**

**(2015 PATTERN)**

**Time : Two Hours**                **Maximum Marks : 50**

**N.B. :—** (*i*)  Answer Q. No. **1** or Q. No. **2**, Q. No. **3** or Q. No. **4**, Q. No. **5** or Q. No. **6** and Q. No. **7** or Q. No. **8**.

(*ii*)  Figures to the right indicate full marks.

(*iii*)  Neat diagram must be drawn wherever necessary.

(*iv*)  Use of non-programmable calculator is allowed.

(*v*)  Assume suitable data, if necessary.

**1.** (*a*)  Draw and explain Master-Slave JK flip-flop.                [6]

(*b*)  Design Mod 8 synchronous counter using T flip-flop.        [6]

*Or*

**2.** (*a*)  Convert SR flip-flop to JK flip-flop.                [6]

(*b*)  Implement a full adder using 8 : 1 multiplexer.        [6]

**3.** (*a*)  Design the sequence generator using JK flip-flop

$$0 \to 2 \to 4 \to 6 \to 0$$                [6]

(*b*)  Explain working of 2 input TTL Nand gate with totem pole.

[6]

P.T.O.

*Or*

**4.** (*a*) Compare TTL and CMOS logic family. [6]

(*b*) Draw circuit diagram of 3-bit SIPO shift register using D flip-flop. Explain its working. [6]

**5.** (*a*) A combinational circuit defined by $f_1 = m$ (0, 3, 4, 7) and $f_2 = m$ (1, 2, 5, 7). Implement using PLA. [6]

(*b*) Compare SRAM and DRAM. [3]

(*c*) Explain PAL with the help of neat a diagram. [4]

*Or*

**6.** (*a*) Implement the following using PAL

F(A, B, C, D) = $\Sigma m$(0, 1, 3, 15) [6]

(*b*) Draw and explain structural diagram of CPLD. [4]

(*c*) Compare CPLD with FPGA. [3]

**7.** (*a*) Write a program for subtraction of 8-bit binary numbers. [3]

(*b*) Explain any *two* addressing modes of 8051. [4]

(*c*) Explain the following instructions with examples : [6]

(*i*) CJNE

(*ii*) SUBB A, R0

(*iii*) JMP @ A + DPTR

(*iv*) LCALL code addr

**8.** (*a*) Draw the pin diagram of 8051 microcontroller and explain its port structure. [6]

(*b*) Explain the function of the following pins of 8051 : [3]

(*i*) EA

(*ii*) $\overline{PSEN}$

(*iii*) RST

(*c*) List the features of 8051. [4]