

# SPPU-SE-COMP-CONTENT – KSKA Git

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**[5459]-182**

**S.E. (Computer Engineering) (I Sem.) EXAMINATION, 2018**

**DIGITAL ELECTRONICS AND LOGIC DESIGN**

**(2015 PATTERN)**

**Time : Two Hours**

**Maximum Marks : 50**

**N.B. :—** (i) Attempt Q. 1 or Q. 2, Q. 3 or Q. 4, Q. 5 or Q. 6,  
Q. 7 or Q. 8.

(ii) Neat diagram must be drawn wherever necessary.

(iii) Assume suitable data, if necessary.

1. (a) How will you implement full-adder using half-adder ? Explain the circuit diagram. [6]
- (b) How lockout condition in counter is avoided ? [2]
- (c) Draw and explain Ring counter using JK flip-flop (Timing Diagram is expected). [4]

*Or*

2. (a) Design full Subtractor using multiplexer IC 74151. [4]
- (b) Compare synchronous and asynchronous counter. [2]
- (c) Simplify the following function using Quine-McCluskey minimization technique :

$$Y(A, B, C, D) = \sum m (0, 1, 2, 3, 5, 7, 8, 9, 11, 14). \quad [6]$$

P.T.O.

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3. (a) Design an ASM chart for 2-bit UP counter using mode control line. [6]

**When M = 1 UP counting**

**When M = 0 remain in same state.**

- (b) Implement the following function using PAL :
- $$F1(A, B, C, D) = \sum m(1, 3, 4, 6, 9, 12, 14)$$
- $$F2(A, B, C, D) = \sum m(1, 2, 3, 7, 12, 15). \quad [4]$$
- (c) Define PLD. Mention different types of PLD. [2]

*Or*

4. (a) Write VHDL code full adder using behavioural style of modeling. [4]
- (b) Explain entity declaration for 4:1 multiplexer having enable line. [2]
- (c) Design BCD to Excess-3 code converter using PLA. [6]
5. (a) Draw three input standard TTL NAND gate and explain its operation. [5]
- (b) Explain the interfacing of TTL and CMOS : [8]
- (i) CMOS driving TTL
- (ii) TTL driving CMOS.

*Or*

6. (a) Draw and explain wired AND gate in detail. [5]
- (b) Explain the characteristics of digital IC. [4]
- (c) Explain with a neat diagram CMOS NOR gate. [4]

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7. (a) Explain addressing modes of 8051 with example (any *three*) : [6]  
(b) List any *eight* applications of microcontroller 8051. [4]  
(c) Explain the following pins of 8051 : [3]  
(i) RXD  
(ii)  $\overline{\text{PSEN}}$   
(iii)  $\overline{\text{EA}}$ .
- Or*
8. (a) State the registers used in Timer/counter operation. Explain TMOD register. [5]  
(b) Explain the following instructions with respect to microcontroller 8051 and give example of each : [8]  
(i) MUL  
(ii) L JUMP  
(iii) SWAP  
(iv) PUSH.