

Roll No .....

**EC-221 (CBCS)****B.E. III Semester**

Examination, December 2017

**Choice Based Credit System (CBCS)****Digital Circuits and System***Time : Three Hours**Maximum Marks : 60*

- Note:** i) Attempt any five questions.  
ii) All questions carry equal marks.

1. a) What is universal gate? Implement AND, OR and NOT gates using NAND gates and NOR gates.  
b) Convert  $(47)_{10}$  to  
i) Binary  
ii) Octal  
iii) Hexadecimal
2. a) Explain the following classification on binary codes.  
Weighted codes  
Non-weighted codes  
Reflective codes  
Alphanumeric codes  
b) Write De-Morgan's theorem. Find the complement of the functions  
 $F_1 = x'yz' + x'y'z$  and  $F_2 = x(y'z' + yz)$ . By applying De-Morgan's theorem.

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3. a) Design a full adder circuit and write its truth table. Implement it with logic gates.  
b) Define multiplexers and draw a  $4 \times 1$  multiplexer. How many selection lines are there?
4. a) Implement a full adder circuit with a (3 to 8 line) decoder and two OR gates.  
b) Simplify the Boolean function using K map.  
 $F(ABCD) = \text{sum of } (0, 1, 2, 4, 5, 6, 8, 9, 12, 13, 14)$
5. a) Differentiate combinational and sequential circuits. Give suitable examples for each class.  
b) What do you mean by Flip-Flops? Define D flip-flop with diagrams and tables.
6. a) Differentiate the followings:  
i) Synchronous and asynchronous counters  
ii) Dynamic and static RAM  
b) What do you mean by shift registers? Design a shift left register of 4 bits.
7. a) Differentiate TTL and DTL logic families. Define fanout.  
b) Define the terms PROM, EEPROM, EAPROM.
8. Write short notes on any two:  
a) PLA  
b) ECL family  
c) Ring counter  
d) Exclusive OR gate

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