

Reg. No. \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

FOURTH SEMESTER B.TECH DEGREE EXAMINATION, JULY 2017

Course Code: **EE204**Course Name: **DIGITAL ELECTRONICS AND LOGIC DESIGN (EE)**

Max. Marks: 100

Duration: 3 Hours

**PART A***Answer all questions; each question carries 5 marks*

1. Perform each of the following conversions:
  - a)  $(473)_{10}$  in to BCD code
  - b) BAD in to ASCII
  - c)  $(289)_{10}$  in to hexadecimal
  - d)  $(110011.110)_2$  in to decimal
  - e)  $(53)_8$  in to hexadecimal
2. Simplify the following Boolean expression  $\overline{AB} + \overline{AC} + \overline{A}BC$ .
3. Design a half adder circuit and realize using NAND gates only.
4. Realise a JK flip flop using SR flip flop.
5. Draw the logical diagram of a 4 bit ring counter using D flip flop.
6. What are the asynchronous inputs of a flip flop and discuss its functions.
7. Compare static RAM and dynamic RAM.
8. Write the VHDL code for the implementation of a full adder circuit.

**PART B***Answer any two questions; each question carries 10 marks*

9. Perform arithmetic operation using 2's complement method.
  - a)  $-70 - 85$  (5)
  - b)  $130 - 65$  (5)
10. Using a 4 variable K map, simplify,  
$$F(A,B,C,D) = \sum m(1,4,9,10,11,12,14) + d(0,8,13)$$
  
Realize the function using NAND gates only. (10)
11. a) Describe the operation of a basic parity generating and checking logical unit. (5)  
b) Compare the characteristics of TTL and CMOS logic families. (5)

**PART C**

*Answer any two questions; each question carries 10 marks*

12. Design a MOD-12 asynchronous counter (ripple counter) using JK flip flop. Explain the working with truth table and timing diagram. (10)
13. a) Draw the block diagram of a 4 bit ALU, and explain it, showing its inputs and outputs. (5)
- b) Design a BCD to decimal decoder. (5)
14. What are fast adders? Design a 4 bit, carry look ahead adder, showing the logical diagram. (10)

**PART D**

*Answer any two questions; each question carries 10 marks*

15. Design a counter to obtain the count sequence 2, 4, 3, 6, 2, 4, 3, 6... using JK flip flop. (10)
16. a) Compare the Moore and Mealy state machine models. (5)
- b) Compare PAL and PLA. (5)
17. With a neat block schematic, describe the working of a successive approximation ADC and illustrate it with a suitable example. (10)

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