

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
Fourth Semester B.Tech Degree Examination June 2022 (2019 scheme)

Course Code: EET206

Course Name: DIGITAL ELECTRONICS

Max. Marks: 100

Duration: 3 Hours

PART A

(Answer all questions; each question carries 3 marks)

		Marks
1	Perform the addition $37_{16} + 29_{16}$	3
2	Using 2's complement method, perform the additions : a) $21 - 42$ b) $-46 - 25$	3
3	Using Boolean algebra techniques, simplify the expression $BD + B(D+E) + \bar{D}(D+F)$	3
4	Convert the expression $(A+B)(C+\bar{B})$ to standard SOP form	3
5	What are select lines and what is its importance in the case of multiplexers and demultiplexers, explain with example.	3
6	Design full adder circuit with decoder IC	3
7	What is the difference between J-K flipflop and S-R flipflop, Explain with truth table and logic implementation.	3
8	With respect to circuit what is the difference between a ring counter and a johnson counter.	3
9	Differentiate between moore and mealy machines	3
10	State the applications of FPGA	3

PART B

(Answer one full question from each module, each question carries 14 marks)

Module -1

11	Draw and explain the circuit for CMOS NOR gate What are the parameters significant to the logic families , Explain any three and compare TTL and CMOS logic on these parameters	14
12	Convert the following numbers: a) $(1010110110111)_2 = ()_{16}$ b) $(0.4D8)_{16} = ()_2$ c) $(214)_{10} = ()_{16}$	14

- d) $(1010110110111)_2 = ()_8$
 e) $(0.725)_8 = ()_2$
 f) $(9264)_{10} = ()_8$
 g) $(467)_8 = ()_{16}$

Module -2

- 13 a) Convert the SOP expression $AB + \bar{A}B + \bar{A}C\bar{D}$ to standard SOP form 5
 b) State and explain De Morgans theorems 4
 c) Apply Demorgans theorem to the expression 5
 $\overline{ABC} + (\bar{D} + \bar{E})$
 14 Explain a look ahead carry generator with relevant expressions and circuit and 14
 give reason for its high speed of operation

Module -3

- 15 Implement the Boolean function 14
 $F(A,B,C,D) = \sum(1,3,4,11,12,13,15)$ using 8:1 MUX and external gates
 16 a) Explain the operation of a 2 bit magnitude comparator 7
 b) Write the applications of a multiplexer and describe the implementation of a 7
 three variable function using multiplexer with a suitable example.

Module -4

- 17 a) What is Race-Around condition of J-K Flip-Flop? Suggest a method to avoid 7
 Race-Around condition of J-K Flip-Flop
 b) Design and implement a J- K flip flop using D flipflop 7
 18 What is modulus of a counter and design a synchronous MOD-5 counter with 14
 state diagram and relevant truth tables.

Module -5

- 19 a) What are the important specifications of a A/D converters 7
 b) Why a weighted resistor type D/A converter is called so. Draw the schematic and 7
 explain.
 20 Implement a full adder using Verilog 14
