

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
THIRD SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2017

Course Code: IT201

Course Name: DIGITAL SYSTEM DESIGN (IT)

Max. Marks: 100

Duration: 3 Hours

PART A

Answer any two full questions, each carries 15 marks.

- | | | Marks |
|---|---|-------|
| 1 | a) i) $(8745)_{10} = (?)_2$ ii) $(110100101011)_2 = (?)_{10}$
iii) $(9B450)_{16} = (?)_{10}$ iv) $(56363)_{10} = (?)_{16}$
v) $(F8E0D)_{16} = (?)_2$ vi) $(10010010)_2 = (?)_8$ vii) $(12534)_8 = (?)_{10}$ | (7) |
| | b) How negative numbers are represented digitally? Explain arithmetic over negative numbers in various representations. Explain merits and demerits of different negative number representations. | (4) |
| | c) Explain Gray code and Excess -3 Code. | (4) |
| 2 | a) Minimize the functions using K-map.
$f(A,B,C,D) = \sum m(0,1,2,3,4,5) + d(10,11,12,13,14,15)$ | (8) |
| | b) List out the postulates of Boolean algebra with examples. | (7) |
| 3 | a) Explain Quine – McClusky method for simplification for logic circuits with examples. | (8) |
| | b) Explain floating point representations and their arithmetic with examples. | (7) |

PART B

Answer any two full questions, each carries 15 marks.

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|---|--|-----|
| 4 | a) Design a 4-bit adder and compare it with carry look ahead adder. | (6) |
| | b) Design a binary to gray code converter. | (4) |
| | c) Design a circuit to generate odd parity bits for decimal numbers represented in BCD code. | (5) |
| 5 | a) Distinguish between combinational and sequential circuits. | (4) |
| | b) Explain the working of master slave flip-flop. | (5) |
| | c) Design decimal to binary encoder. | (6) |
| 6 | a) Describe procedure for converting from one type of flip-flop to another and perform i) JK to D ii) D to T iii) RS to JK | (6) |
| | b) Explain how a 3-bit counter can be implemented using a multiplexer. | (4) |
| | c) Explain state reduction with example. | (5) |

PART C

Answer any two full questions, each carries 20 marks.

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|---|---|------|
| 7 | a) Design a serial in parallel out shift register. | (10) |
| | b) Explain different types of ROMs. | (4) |
| | c) What are applications for shift registers? | (6) |
| 8 | a) Design and implement ring and Johnson counters. | (10) |
| | b) Distinguish between PAL and PLA. | (4) |
| | c) Explain different types of error-detecting codes. | (6) |
| 9 | a) Design a decimal up –down counter with a mode control. | (8) |
| | b) Design and implement a universal shift register. | (8) |
| | c) Explain Booths algorithm with example. | (4) |
