

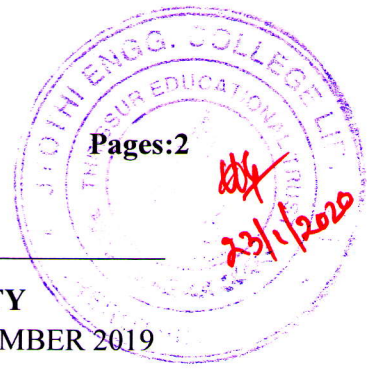
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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FOURTH SEMESTER B.TECH DEGREE EXAMINATION(S), DECEMBER 2019

Course Code: EE204

Course Name: DIGITAL ELECTRONICS AND LOGIC DESIGN

Max. Marks: 100

Duration: 3 Hours

PART A

Answer all questions, each carries 5 marks

Marks

- | | | |
|---|---|---|
| 1 | a) Convert $9B30_{16}$ to decimal . | 5 |
| | b) Subtract $5C_{16}$ from 94_{16} . | |
| 2 | Convert $Y=AB + B'CD$ into a product of max terms by algebraic method. | 5 |
| 3 | Design a full subtractor and show that it can be realized using two half subtractors. | 5 |
| 4 | Realize an S-R flip flop using D flip flop. | 5 |
| 5 | What is the importance preset and clear pin in flip flops? How they are utilised when designing a counter . | 5 |
| 6 | Explain Moore state machine model | 5 |
| 7 | Draw the schematic of a successive approximation A/D converter and explain working | 5 |
| 8 | Differentiate ROM, PLA and PAL circuits | 5 |

PART B

Answer any two questions, each carries 10 marks

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|----|---|---|
| 9 | a) Explain the gray code 10110010101 to binary numbers | 3 |
| | b) Convert 1010.011_2 into decimal number | 3 |
| | c) Add the hexadecimal numbers $DF_{16} + AC_{16}$ | 4 |
| 10 | a) Differentiate the methods of binary subtraction using 1's complement and 2's complement methods with suitable example. | 5 |
| | b) Obtain the canonical product of sum form of the following function;
$F(A,B,C) = (A+B')(B+C)(A+C')$ | 5 |
| 11 | a) Apply De-Morgan's theorems to the following expression $(ABC)' + (D'+E)'$ | 5 |
| | b) Using karnaugh map, simplify the expression
$F(A,B,C,D) = \sum (0,2,3,5,7,8,13) + d(1,6,12)$ | 5 |

PART C

Answer any two questions, each carries 10 marks

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|----|---|---|
| 12 | a) Design a full adder circuit with decoder I C | 5 |
|----|---|---|

- b) Realize a 4 bit parallel binary adder with look ahead carry generator 5
- 13 a) Implement the function $F(A,B,C,D) = \sum(0,1,3,4,8,9,15)$ using a suitable multiplier 5
- b) What is the race around condition of a J-K flip flop? How can it be avoided 5
- 14 a) Show how a T flip flop can be converted to S-R flip flop 5
- b) Draw a parallel in –serial out (PISO) register and explain its working 5

PART D

Answer any two questions, each carries 10 marks

- 15 a) Explain why Johnson counter have decoding gates, where as Ring counter does not? 5
- b) Explain the design of a synchronous counter with modulus $< 2^n$, take MOD -5 counter as an example to illustrate 5
- 16 a) Construct a Johnson counter for 12 timing sequences. 5
- b) Describe flash ADC and integrating type ADC 5
- 17 a) Design and implement a half adder and a full adder using VHDL 5
- b) Explain FPGA and what are the advantages of FPGA over other types of PLD 5
