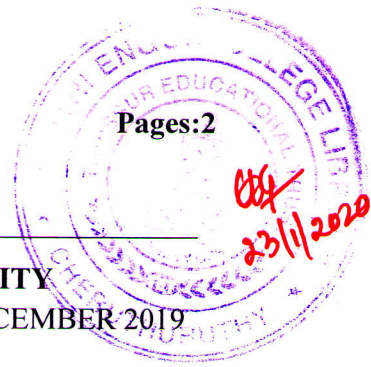Reg No.:_____   Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FOURTH SEMESTER B.TECH DEGREE EXAMINATION(S), DECEMBER 2019
Course Code: EC212
Course Name: LINEARINTEGRATED CIRCUITS AND DIGITAL ELECTRONICS

Max. Marks: 100   Duration: 3 Hours

PART A
Answer all questions, each carries 5 marks.

Marks

1. 'Sample and hold circuit can samples an input signal and holds on to its last sampled value'. Justify the statement.   (5)

2. Compare the combinational and sequential circuits. Give a few examples of each of them.   (5)

3. Derive the output voltage for a 4 bit R-2R ladder D/A converters.   (5)

4. Write a short note on the following
   a) offset voltage
   b) Bias current   (5)
   c) CMMR
   d) Slew rate

5. Show that how a S-R flip flop can be converted into a D flip flop.   (5)

6. a) Subtract using 1's complement, 100-110000.   (5)

   b) Subtract using 2's complement, 11011-100101.

7. Design an octal to binary encoder.   (5)

8. Define ROM. Differentiate between static and dynamic RAM.   (5)

PART B
Answer any three full questions, each carries 10 marks.

9. a) Perform the following conversions.   (10)

   a) $(4021.25)_{10}$ to binary   d) $(4537)_8$ to hexadecimal

   b) $(95.05)_{10}$ to hexadecimal   e) $(11010111)_2$ to octal

   c) $(1E7C)_{16}$ to octal

10. a) How we can use log and antilog amplifier in analog multiplier.   (4)

    b) A Schmitt trigger with the upper threshold level $V_{UT} = 0V$ and hysteresis width $V_H = 0.2V$ converts a 1 kHz sine wave of amplitude $4V_{pp}$ into a square wave. Calculate the time duration of the negative and positive portion of the output waveform   (6)

11   a)   Derive an expression to obtain the transfer function of second order low pass filter.   (6)

     b)   Explain the working of a successive approximation type A/D converters.   (4)

12   Briefly explain different applications of Op-Amp.   (10)

13   a)   Simplify using K Map.   (6)

         $F(A,B,C,D)= \pi(1,3,5,7,13,15)$

     b)   State and prove De Morgan's theorems.   (4)

PART C
Answer any two full questions, each carries 15 marks.

14   a)   Design a code converter which converts a 4 bit binary number to corresponding grey code.   (10)

     b)   Explain how a full adder circuit can be designed with the help of two half adders?   (5)

15   a)   Design a 4 bit shift left and shift right register using JK flip flop and also draw its output waveform.   (6)

     b)   Design a sequence detector that produces an output '1' whenever the non overlapping sequence 1101 is detected   (9)

16   a)   What is a demultiplexer? Explain the difference between DEMUX and MUX.   (5)

     b)   Implement the following Boolean function by using 8X1 multiplexer, $f(A, B, C, D) = \Sigma m (0, 2, 3, 6, 8, 9, 13, 14)$.   (10)

17   Design and implement a 4 bit synchronous down counter by using JK flip flops.   (15)

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