CBCS SCHEME

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17CS32

Third Semester B.E. Degree Examination, June/July 2019
Analog and Digital Electronics

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. List any 4 differences between JFET and MOSFET. **(04 Marks)**

b. Explain with help of neat diagram the working of N-channel JFET and sketch its characteristics. **(08 Marks)**

c. With help of block diagram, explain the operation of a astable multivibrator using IC 555. **(08 Marks)**

OR

2 a. Sketch and explain the working of peak detector. **(06 marks)**

b. State and explain any four performance parameters of an operational amplifier. **(08 marks)**

c. Illustrate the various types of filters with neat diagram and definations. **(06 Marks)**

Module-2

3 a. Use a Karnaugh map to find minimum 80p form for the following Boolean function :
$f(a, b, c, d) = \Sigma m(0, 2, 3, 5, 6, 7, 8, 9) + d(10, 11, 12, 13, 14, 15)$.
Also draw the logic circuit diagram for the simplified SOP. **(10 Marks)**

b. Apply Quine Mc-clusky method to find essential prime implicants for the Boolean function $f(a, b, c, d) = \Sigma m(1, 3, 6, 7, 10, 12, 13, 14, 15)$.
Write prime implicant table. **(10 Marks)**

OR

4 a. There are 4 adjacent parking slots in Mega Inc. executive parking area. Each slot is equipped with sensor whose output is asserted high when a car is occupying the slot. Write a truth table so that the output is high if two or more vacant parking is available.

i) Write truth table
ii) Find the expression of the system that will signal the existence of two or more vacant slots
iii) Simplify the expression
iv) Draw the logic diagram for simplified expression. **(10 Marks)**

b. Briefly explain an HDL implementation models. And write the HDL program for the following circuit shown in using in figure Fig.Q4(b) using structural model. **(07 Marks)**

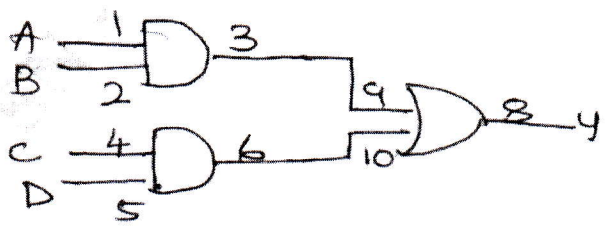

Fig.Q4(b)

c. What is hazards? List the types of hazards. **(03 Marks)**

Module-3

5 a. Implement the full adder outputs using 3 – 8 decoder. (07 marks)
b. Design one bit magnitude comparator and implement it using de-multiplexer (08 Marks)
c. Distinguish between combinational and sequential circuit. (05 Marks)

OR

6 a. Design a seven segment display using PLA. (10 Marks)
b. Show now 1 : 4 de-multiplexer is used to get 1 : 16 de-multiplexer. (04 Marks)
c. With the help of block diagram explain PAL and PLA. (06 Marks)

Module-4

7 a. The sequence 1011 is applied to the output of a 4 bit serial shift register that is initially cleared. With the help of diagram show how sequence is being entered serially into the register. (08 Marks)
b. Design a self correcting modulo-6 counter in which all the unused state leads to state ABC = 000. (08 Marks)
c. Draw the logic diagram, truth table and waveforms for a two flip-flop ripple counter. (04 Marks)

OR

8 a. Sketch a ring counter and Jonnson counter and write its truth table. (08 Marks)
b. Explain how toggle flip-flop is used as frequency divider circuit. Sketch the output waveforms. (08 Marks)
c. A 4-bit binary asynchronous counter is connected. With a clock of 500 KHz frequency. Find the time period of the wave forms at the o/p of all the flop-flops. (04 Marks)

Module-5

9 a. Design synchronous counter for the sequence 1 – 3 – 5 – 7 – 1 using J-K flip-flop. (12 Marks)
b. Explain digital clock with neat diagram. (04 Marks)
c. Explain the terms accuracy and resolution for D/A converter. (04 Marks)

OR

10 a. Explain with block diagram the operation of successive approximation ADC. (08 Marks)
b. Explain the binary ladder with digital input 1100. (08 Marks)
c. For a 5 bit resistive divider, determine the following :
i) Weight assigned to binary
ii) Weight assigned to second and third LSB
iii) The change in output voltage due to a change in the LSB, the second LSB and the third LSB
iv) The output voltage for a digital input of 10101.
Assume 0 = 0V and 1 = +10V.

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