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Code No. : 22305

VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD

B.E. II Year (E.C.E.) II - Semester (Main) Examinations, May - 2016

Pulse, Digital and Switching Circuits

Time: 3 hours

Max. Marks: 70

Note: Answer ALL questions in Part-A and any FIVE from Part-B

Part-A (10 × 2 = 20 Marks)

1. A low pass RC circuit is called an integrator. Justify.
2. State the clamping circuit theorem, what is its significance.
3. Explain about the need for commutating capacitors in bistable multivibrator.
4. Which multivibrator is used as a voltage to frequency converter? Write the expression for its output frequency.
5. Write the truth table for equivalency gate and state its applications.
6. State and prove the Demorgans laws.
7. Realize half subtractor using only NAND gates.
8. Convert D flip-flop to JK flip-flop.
9. Distinguish between synchronous and asynchronous counters.
10. Compare and contrast Melay and Moore FSMs.

Part-B (5 × 10 = 50 Marks)

11. a) A 2 KHZ symmetrical square wave of ± 10 V is applied to a RC circuit having 1 mSec time constant. Calculate and plot the output scale for highpass RC configuration. [5]
b) Explain the working of two-level diode clipper with the help of circuit diagram, waveforms and transfer characteristics. [5]
12. A collector coupled monostable multivibrator using NPN silicon transistor has the following parameters: $V_{cc} = 12$ V, $V_{BB} = 3$ V, $R_c = 2$ K Ω , $R_1 = R_2 = R = 20$ K Ω , $h_{fe} = 30$, $R_{bb1} = 200$ Ω and $C = 1000$ pF. Neglect I_{CBO} . [10]
i) Calculate and plot to scale the wave shapes at base and collector of each one of the transistor.
ii) Find the width of the output pulse.
13. a) Minimize the function using Tabular method $F(A, B, C, D) = \Sigma m(2, 4, 6, 8, 9, 10, 12, 13, 15)$ [7]
b) Find prime implicants and essential prime implicants. [3]
14. a) Explain static hazard free situation with an example. [3]
b) Design a circuit that converts BCD code to Gray code and draw its realization using suitable gates. [7]
15. a) Design a modulo-5 counter using master slave JK flip-flops that count as 000-001-010-011-100. The unused states 101, 110, and 111 goes to 000 at a next clock trigger. [7]
b) What is race around condition? Explain how it is avoided by using master-slave JK flip-flop? [3]
16. a) Derive a condition for a perfect attenuation in a compensated attenuator. [5]
b) Define three types of errors that occur in time base generators. [3]
c) What are the applications of a regenerative comparator circuit? [2]
17. Write short notes on any *two* of the following:
a) Canonical SOP [5]
b) Priority encoder [5]
c) Sequence detector [5]
