

**B.Tech. - VIEP - ELECTRONICS AND
COMMUNICATION ENGINEERING
(BTECVI)**

Term-End Examination

00629

December, 2017

BIELE-012 : ELECTRONIC SWITCHING CIRCUITS

Time : 3 hours

Maximum Marks : 70

Note : Attempt any *seven* questions. All questions carry equal marks. Assume missing data, if any. Use of scientific calculator is permitted.

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1. (a) Distinguish between Combinational and Sequential circuits. 3
 - (b) Differentiate between Latch and Register. Explain using timing diagram. 3
 - (c) Explain the operation of SR flip-flop and mention its excitation table. 4

 2. (a) Explain the operation of JK flip-flop. How does a JK flip-flop differ from an SR flip-flop in its operation ? What is its advantage over an SR flip-flop ? 5
 - (b) An 8-bit D/A converter has a step size of 20 mV. Determine the full-scale output and percentage resolution. 5

3. A long input sequence enters a one-input one-output synchronous sequential circuit that is required to produce an output symbol $z = 1$. Whenever the sequence 1111 occurs, overlapping sequences are accepted. For example, if the input sequence is 01011111..., the required output sequence is 00000011... .

- (a) Draw a state diagram.
- (b) Select an assignment and show the excitation and output tables.
- (c) Write down the excitation functions for SR flip-flops and draw the corresponding logic diagram.

10

4. (a) Design a modulo-8 counter that counts in the way specified in the table shown below, using JK flip-flop :

8

Decimal	Gray Code
0	0 0 0
1	0 0 1
2	0 1 1
3	0 1 0
4	1 1 0
5	1 1 1
6	1 0 1
7	1 0 0

- (b) Differentiate between synchronous and asynchronous sequential circuits. 2
5. (a) What is hazard in a logic circuit ? Classify the hazards in logic circuits. 5
- (b) How do you design a hazard-free circuit ? Explain with suitable example. 5
6. Analyze the circuit as shown in Figure 1 for static hazards. Redesign it to make it static hazard-free. 10

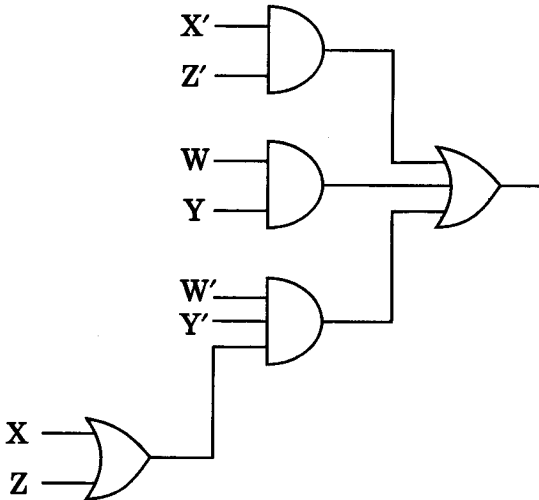


Figure 1

7. (a) Explain the operation of Master-Slave JK flip-flop with set and clear inputs. 5
- (b) Explain the working principle of a negative edge-triggered D-flip-flop. 5

8. (a) Describe the symmetric functions and enlist all the properties of symmetric functions. 5
- (b) What do you mean by Contact Network ? Explain the synthesis process of a contact network with suitable example. 5
9. Briefly describe
- (a) how the architecture of an asynchronous up-counter differs from that of a down-counter. 5
- (b) how the architecture of a ring counter differs from that of a shift counter. 5
10. Write short notes on any *two* of the following : $2 \times 5 = 10$
- (a) Glitches
- (b) Dynamic Hazards
- (c) Pulse Mode Circuits
- (d) Sequence Detector and Sequence Generator
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