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BIELE-012

B.Tech. – VIEP – ELECTRONICS AND COMMUNICATION ENGINEERING (BTECVI)

Term-End Examination

00953

December, 2016

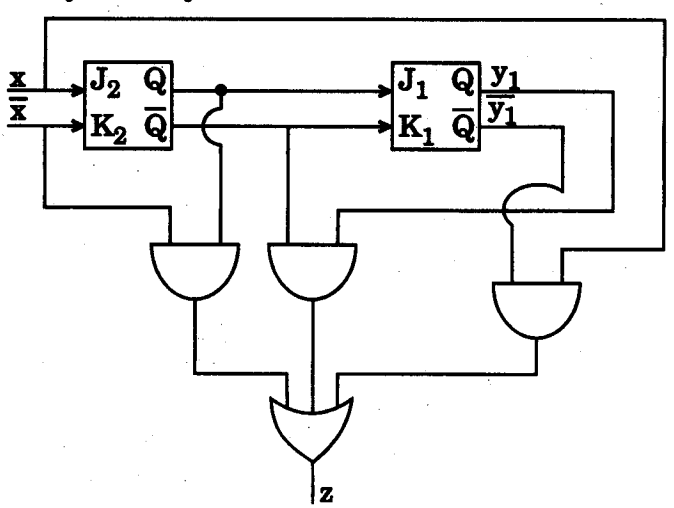
BIELE-012 : ELECTRONIC SWITCHING CIRCUITS

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.*

1. Design a 3-bit up-down counter with a control input P such that when P = 1, it counts up and when P = 0, it counts down. *10*

2. Analyze the synchronous circuit shown below :



(a) Write down the excitation and output functions.

(b) Form the excitation table and state table. *10*

3. Design a modulo-8 counter which counts in the way given below. Use JK flip-flops in your realization. *10*

Decimal	*Gray code (count sequence)*
0	000
1	001
2	011
3	010
4	110
5	111
6	101
7	100

4. The output z of a fundamental-mode two-input sequential circuit is to change from 0 to 1 only when x_2 changes from 0 to 1, while $x_1 = 1$. The output is to change from 1 to 0 only when x_1 changes from 1 to 0, while $x_2 = 1$.

(a) Find a minimum row reduced flow table.

(b) Write a set of hazard-free excitation and output equations. *10*

5. A sequential circuit has two pulse inputs x_1 and x_2. The output of the circuit becomes '1' when one or more consecutive x_1 pulses are followed by two x_2 pulses. The output then remains '1' for all subsequent x_2 pulses until all x pulses occur.

   (a) Derive a minimal state table.

   (b) Synthesize the circuit using set-reset flip-flops. *10*

6. Explain the design of hazard-free combinational circuit and the design of hazard-free asynchronous circuit. *10*

7. What are the different types of hazards ? Explain how these can be avoided. *10*

8. Explain the synthesis of symmetric functions with the help of a suitable example. *10*

9. Write short notes on any ***two*** of the following : *2×5=10*

   (a) Generation of Spikes

   (b) Relay Contents

   (c) Conversion of Mealy Circuit to Moore Circuit
