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C20-CM–302

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BOARD DIPLOMA EXAMINATION, (C-20)

JUNE/JULY—2022

DCME - THIRD SEMESTER EXAMINATION

DIGITAL ELECTRONICS

Time : 3 hours] [*Total Marks* : 80

PART—A 3×10=30

Instructions : (1) Answer **all** questions.

(2) Each question carries **three** marks.

(3) Answers should be brief and straight to the point and shall not exceed five simple sentences.

1. Define binary coded decimal coding.

2. Give the bases of octal, binary and hexa-decimal number systems.

3. State De-Morgan's theorems.

4. Explain how EX-NOR gate is different from EX-OR gate.

5. Give the advantages of negative logic over positive logic.

6. What is triggering in the flip-flop?

7. How asynchronous counter differ from synchronous counter?

8. Define programmable counter.

9. State the purpose of programmable logic device.

10. List any three applications of decoders.

PART—B

8×5=40

Instructions : (1) Answer **all** questions.

(2) Each question carries **eight** marks.

(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

11. *(a)* What are the value of *(i)* $AEF7_{(16)}$ in to octal and *(ii)* $8F9A_{(16)}$ in to binary?

(OR)

(b) Justify how excess-3 code is the self-complementing code using 8421 code.

12. *(a)* Give the steps of how the Sum of Products (SOP) method gives the Boolean expression of the below truth table.

A	*B*	*C*	*Y*
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	0

(OR)

(b) Give the steps of how the K-map reduces the given expression $Y = \Sigma m(1,3,4,5,7,9,11,13,15)$.

13. *(a)* Suggest the flip-flop and give the steps of how it eliminates forbidden state of SR flip-flop with truth table.

(OR)

(b) Recommend the inputs using truth table make the RS flip-flop outputs into SET and RESET without triggered edge of clock pulse.

14. *(a)* Give the steps to modify the UP counter to measure both UP and DOWN with truth table.

(OR)

(b) Suggest a Register that is taking data in parallel and taking out data in parallel with circuit diagram by stating the working process clearly.

15. *(a)* Suggest a device and explain how it transmits the single line data into three outputs.

(OR)

(b) Name the device in which 8 inputs are transmitted on a line with 3-bit controllers and draw the circuit with proper explanation of working process.

PART—C

10×1=10

Instructions : (1) Answer the following question.

(2) Question carries **ten** marks.

(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

16. Assume that you have an adder that adds two numbers at a time, deconstruct it such that they are not added in serial. Comment on time taken to add the two numbers after deconstructing. Justify your answer by giving steps to deconstruct it.

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