

**19U325S**

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Name: .....

Reg. No.....

**THIRD SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2020**

(CUCBCSS - UG)

**CC15U BCS3 B04 - FUNDAMENTALS OF DIGITAL ELECTRONICS**

(Computer Science – Core Course)

(2015, 2016 Admissions - Supplementary)

Time: Three Hours

Maximum: 80 Marks

**PART A**

Answer *all* questions. Each question carries 1 mark.

1. The bit sequence 0010 is serially entered (right most bit first into a 4-bit parallelout shift register that is initially clear. What are the Q output after two clock pulse.  
(a) 000                      (b) 0010                      (c) 1000                      (d) 1111
2. How many flip-flops are required to make a MOD-32 binary counter?  
(a) 3                      (b) 5                      (c) 45                      (d) 9
3. The BCD code of (256) \_\_\_\_\_
4. What is a multiplexer?
5. Give the symbol for EX-NOR gate.
6. Give an application of Shift Registers.
7. What is the maximum modulus of Ripple counter with 4 flip-flop?
8. Simplify the expression-  $((AB)' + (A'B'))$
9. \_\_\_\_\_ GATE is “Any or All” gates.
10. The full adder has \_\_\_\_\_ inputs.

**(10 x 1 = 10 Marks)**

**PART B**

Answer *all* questions. Each question carries 2 marks.

11. State and prove De-Morgan's theorems?
12. Give a note on conversion of binary to Gray code.
13. Give features of T flip-flop?
14. Explain the ASCII.
15. What is a multiplexer?

**(5 x 2 = 10 Marks)**

**PART C**

Answer any *five* questions. Each question carries 4 marks.

16. Convert the expression  $(A'+B)(C'+D)$  into standard POS.
17. Draw the Logic circuit of the expression-  $(A'B'+AB')(CD+CD')$ .

18. Explain CRC method of error detection code in detail.
19. Explain the following
- a) SR Flip-flop                  b) D Flip-flop
20. Explain the 4 x1 multiplexers with a neat figure.
21. Convert the binary number (10101011).
- a) Octal                                  b) Hexa-decimal                  c) Decimal                                  d) 2' complement
22. Explain Asynchronous counters in detail.
23. Simplify the given expression with K-map to SOP and POS form  
 $(A+B+C)(A+B+C')(A+B'+C)(A+B'+C')(A'+B'+C)$ .

(5 x 4 = 20 Marks)

#### PART D

Answer any *five* questions. Each question carries 8 marks.

24. Explain the following.
- a) UP-DOWN Asynchronous counters                  b) UP-DOWN Synchronous counters.
25. Explain the Adders in detail?
26. Explain the following
- a) Johnson's counter    b) Ring Counter.
27. Describe the following Analog to Digital conversion techniques.
- a) Counter type method using D/A                  b) Simultaneous method
28. Describe two types of Digital to Analog converters with block diagram.
29. Simplify the given expression with k-map and draw the realisation using Basic gates
- a)  $A'B'C'+AB'C'+A'BC'+ABC'$
- b) The truth table of the logic circuit shows high output for the input combinations 101,011,001,000,100 and low for all other combinations.
30. Explain the following
- a) S-R Latch    b) Master Slave JK Flip-Flop
31. Describe the four types of Shift registers in detail.

(5 x 8 = 40 Marks)

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