

<b>A-8980</b>
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<b>Sub. Code</b>
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<b>4BCESA1</b>
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**U.G. DEGREE EXAMINATION, NOVEMBER 2019**

**Computer Science**

**Allied – DIGITAL ELECTRONICS AND COMPUTER  
ARCHITECTURE**

**(CBCS – 2014 onwards)**

Time : 3 Hours

Maximum : 75 Marks

**Part A**

(10 × 2 = 20)

Answer **all** questions.

1. Convert the decimal number 950 to equivalent hexadecimal number.
2. Show that  $X + \overline{X}Y = X + Y$ .
3. What is a decoder?
4. Draw the logic diagram and truth table for Half adder.
5. Draw the logic diagram of Basic flip-flop circuit with NOR gate.
6. Differentiate synchronous and Asynchronous counters.
7. What are the common fields found in instruction format?
8. What do you mean by addressing mode?
9. What is meant by locality of reference?
10. Write the need for virtual memory.

**Part B****(5 × 5 = 25)**

Answer **all** questions, choosing either (a) or (b).

11. (a) What are XOR and X NOR gates? Give truth tables for 2 input XOR and X NOR gates.

Or

- (b) What is the canonical form of logic expressions? Explain min terms and max terms.
12. (a) What are the various steps involved in the design procedure of combinational circuits? Discuss.

Or

- (b) Implement a full-subtractor with two half-subtractors and an OR gate.
13. (a) Describe the operations of R-S flip-flop with logic diagram and truth table.

Or

- (b) Explain briefly about the shift counters.
14. (a) Explain about the general – register organization with neat diagram.

Or

- (b) Explain the organization of a stack. What are the instructions associated with it?
15. (a) With a neat diagram, explain the typical memory hierarchy in a large computer system.

Or

- (b) What are the three types of mapping procedures in the cache memory organization? Discuss.

**Part C** $(3 \times 10 = 30)$ Answer any **three** questions.

16. Simplify the Boolean function  
 $F(A, B, C, D) = \sum(0, 1, 2, 5, 8, 9, 10)$  in sum of products and product of sums.
  17. Describe the functions of multiplexer with an example of Boolean function implementation.
  18. Explain the working of master / slave flip flop in detail.
  19. Discuss on data transfer and manipulation instructions.
  20. Describe the working of an associative memory and explain the match logic.
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