

V

(20516)

Roll No.

BCA-II Sem.

18007

B.C.A. Examination, May 2016

DIGITAL ELECTRONICS AND COMPUTER

ORGANISATION

(BCA-204)

(New)

Time : Three Hours]

[Maximum Marks : 75

Note : Attempt questions from all Sections as per instructions.

Section-A

(Very Short Answer Questions)

Attempt all the *five* questions of this Section. Each question carries 3 marks. Very short answer is required not exceeding 75 words. $3 \times 5 = 15$

1. What are logic gates? Draw the schematic block diagram of a 3-input AND gate. Give its truth table. 3

(2)

2. What is decoder and encoder? 3
3. What do you mean by Cache memory? 3
4. What is the function of shift-register? Where are such registers used? 3
5. Differentiate RAM and ROM. 3

Section-B

(Short Answer Questions)

This Section contains three questions, attempt any *two* questions. Each question carries $7\frac{1}{2}$ marks. Short answer is required not exceeding 200 words. $7\frac{1}{2} \times 2 = 15$

6. Draw K-map and simplify the following boolean expression : 7½

$$Y(A, B, C, D) = \sum(0, 2, 4, 6, 8, 10, 12, 14, 15).$$
7. What is shortcoming of an S-R flip-flop? Explain how its shortcoming is removed by J-K flip-flop. Describe its operating principle. 7½
8. Explain the difference between static and dynamic memories. 7½

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Section-C

(Detailed Answer Questions)

This Section contains five questions, attempt any *three* questions. Each question carries 15 marks. Answer is required in detail. $15 \times 3 = 45$

9. Explain the various Boolean laws and simplify the following boolean expressions : 5×3
- (a) $(\bar{A} + B + \bar{B}A)D$
 - (b) $\bar{A}\bar{B}\bar{C} + A\bar{B}\bar{C} + \bar{A}\bar{B}C + A\bar{B}C$
 - (c) $\bar{A}\bar{B}\bar{C} + \bar{A}\bar{B}CD + \bar{B}\bar{C}$
10. (a) Implement a full-subtractor with two half-subtractors and an OR-gate. $7\frac{1}{2}$
- (b) Show how a full-adder can be converted to a full-subtractor with the addition of one inverter circuit. $7\frac{1}{2}$
11. Write short notes on the following : 3×5
- (a) EPROM
 - (b) Dynamic RAM
 - (c) Hard disk
 - (d) Floppy disk
 - (e) CD-ROM.

12. Discuss the working principle of a synchronous (parallel) counter with its block diagram. What is the advantage of synchronous counters over asynchronous (ripple) counters? Give same example(s) of both types of counters. 15
13. What is associative memory? Draw and explain its block diagram. How read operations and write operations are performed in associative memories. 15