No. of Printed Pages—2

392 (CF)

[17–HRGPKAC–D1S]

BCA 1st Semester Exam., 2017

COMPUTER FUNDAMENTALS AND INTRODUCTION TO DIGITAL LOGIC

[BCA (S1) 01]

Full Marks : 80

Time : 3 hours

The figures in the margin indicate full marks for the questions

1. Answer the following questions : 1×8=8

(a) What is flip-flop?

(b) What is a workstation?

(c) What is don't care condition?

(d) Differentiate between PROM and EPROM.

(e) Find the 1's complement of 1101.

(f) What is demultiplexer?

(g) What is the function of an encoder?

(h) Define counters.

2. Answer the following questions : 2×8=16

(a) Convert the binary number 1110 to Gray code.

(b) What is duality principle?

(c) Mention the different classifications of computers.

(d) What does De Morgan's theory state?

(e) Convert the decimal number 23·45 to BCD.

(f) How are fourth-generation computers different from previous generation computers?

(g) Differentiate between supercomputers and mainframe computers.

(h) What are logic gates?

3. Answer any *five* from the following questions : 4×5=20

(a) Describe in brief the characteristics of computer.

(b) Explain overflow and underflow using an example.

(c) Draw the truth table and graphic symbol for a 3-input XOR gate.

(d) Differentiate between random access and sequential access.

(e) Give the truth table and logic circuit of full adder.

(f) Give the symbol and truth table for AND and OR gates.

4. Answer any *two* from the following questions : 8×2=16

(a) Explain the fixed point representation of numbers.

(b) Simplify the following :

(i) $A.B.C.D + A.B'.C.D + A'.B.C.D + A'.B'.C.D$ using Karnaugh map

(ii) $X.(X+Y)+Y.(X'+Y)$ using algebraic method

(c) Define CPU. Describe in brief the different components of CPU.

5. Answer any *two* from the following questions : 10×2=20

(a) What is shift register? What are the different types of shift register? Explain any two applications of shift register in brief. 2+4+4=10

(b) What is a bus? List some of the main functions of a bus. Describe, in brief, the different types of computer buses. 1+4+5=10

(c) Explain $(r-1)$'s and r's complement of numbers using examples. 10

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