V Semester B.C.A. Examination, Nov./Dec. 2013
(2K8 Scheme)
COMPUTER SCIENCE
BCA 502 : Computer Architecture

Time : 3 Hours
Max. Marks : 90/100

Instructions: 1) Answer all Sections.
2) Section D for 2011-12 onwards.

SECTION – A

I. Answer any ten questions. Each carries two marks. (10x2=20)
1) Write the symbol, expression and truth table of NOR gate.
2) What is excitation table and state diagram ?
3) What is IC ? Mention the types.
4) What are encoder and decoder ?
5) Convert 782.43\(_{(10)}\) to binary.
6) Write a Gray code for the decimal number 0 to 10.
7) What are the different phases in instruction cycle ?
8) What are FGI and FGO ?
9) What is the control selection variables generated in the control unit ?
10) Mention the different types of interrupts.
11) What is handshaking ?
12) What is auxiliary memory ?

SECTION – B

II. Answer any five questions. Each carries five marks. (5x5=25)
13) Explain working JK flip-flop with neat diagram.
14) Explain 4-to-1 line Multiplexer.
15) Discuss the parity generator and parity checker.
16) Explain the different registers in basic computer.
17) Explain Input-Output instructions.
18) Explain the classification of computer instructions based on number of address.
19) Explain DMA controller with a block diagram.
20) Write a note on virtual memory.

SECTION – C

III. Answer any three questions. Each carries fifteen marks. (3\times15=45)

21) a) Simplify the following Boolean function using K-map:

\[ F(w, x, y, z) = \Sigma (1, 2, 4, 7, 8, 10, 13) \] and \( d(w, x, y, z) = \Sigma (0, 6, 11, 14). \)

b) Explain different binary codes. (7+8)

22) Design a sequential circuit with two JK flip-flops A and B and two inputs E and x. If E = 0, the circuit remains in the same state regardless of the value of x. When E = 1 and x = 1, the circuit goes through the state transitions from 00 to 01 to 10 to 11 back to 00, and repeat. When E = 1 and x = 0, the circuit goes through the state transitions from 00 to 11 to 10 to 01 back to 00, and repeat.

23) Explain the complete control functions and micro-operation for basic computer with neat flowchart.

24) a) Explain the addressing modes.

b) Explain the data transfer instructions. (8+7)

25) a) Write note on programmed I/O.

b) Explain the main memory. (7+8)

SECTION – D

(2011-12 Batch onwards only)

IV. Answer any one question. Each carries ten marks. (1\times10=10)

26) a) Explain the Full-Adder.

b) Explain 4-bit shift register. (5+5)

27) a) Explain the common bus system.

b) Write a note on RISC and CISC. (5+5)