



SN – 477

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. (10×2=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. (5×5=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. **(3×15=45)**

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

$$F(w, x, y, z) = \sum (1, 2, 4, 7, 8, 10, 13) \text{ and } d(w, x, y, z) = \sum (0, 6, 11, 14).$$

- 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. **(1×10=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)**