(CBCS – Fresh – 2016 – 17 & Onwards)
BCA – 503 : COMPUTER ARCHITECTURE

Time : 3 Hours
Max. Marks : 100

Instruction : Answer all Sections.

SECTION – A

I. Answer any ten questions. Each carries two marks. (10×2=20)

1) What is Computer Architecture ?
2) State and prove DeMorgan’s theorem.
3) Mention the different logic families of IC.
4) Distinguish between RAM and ROM.
5) What is Parity bit ?
6) Write the BCD code for decimal number 8745.42\(_{(10)}\)
7) What are the two types of control organization ?
8) Define program counter.
9) Mention the major components of CPU.
10) What is PSW ?
11) What is Polling ?
12) What is memory management system ?

SECTION – B

II. Answer any five questions. Each carries five marks. (5×5=25)

13) Prove NAND and NOR gates as universal gates.
14) Explain PIPO shift Register with a diagram.
15) Discuss the Parity generator and Parity checker.
16) Explain the operation of interrupt cycle with a flow chart.
17) Explain input-output instructions.  
18) Explain the three types of CPU organization.  
19) Explain the source initiated data transfer using handshaking with a block diagram and timing diagram.  
20) Write a note on memory hierarchy in a computer system.  

SECTION – C

III. Answer any three questions. Each carries fifteen marks. (3×15=45)

21) a) Define K-Map? Simplify the following Boolean function using K-Map:
   \[ F(A, B, C, D) = \sum(0, 2, 4, 6, 10, 11, 12, 13, 14, 15) \]
   b) Explain different binary codes.  

22) a) Define counter. With a neat diagram explain 4-bit synchronous binary counter.
   b) Explain octal to binary encoder with diagram.  

23) Explain the design of basic computer with flow chart.  

24) What is addressing mode? Explain the different types of addressing modes with examples.  

25) a) Explain DMA controller with a block diagram.  
   b) Explain the working of associative memory.  

SECTION – D

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

26) a) Explain the working of full adder.  
   b) Write a note on modes of data transfer.  

27) a) Explain the common bus system.  
   b) Write a note on RISC and CISC.