



SS – 684

V Semester B.C.A. Degree Examination, Nov./Dec. 2018

(CBCS) (F + R)

(2016-17 and Onwards)

COMPUTER SCIENCE

BCA-503 : Computer Architecture

Time : 3 Hours

Max. Marks : 100

Instruction : Answer all Sections.

SECTION – A

I. Answer any ten questions : (10×2=20)

- 1) Explain Full adder.
- 2) Define universal gates with logic circuit.
- 3) Explain BSA instruction.
- 4) State De-Morgan's theorem.
- 5) Define Flip-Flop.
- 6) Why we use shift register ?
- 7) Explain Hamming code ?
- 8) Define Indirect Address Mode.
- 9) What is meant by Memory-Mapped I/O ?
- 10) Define virtual memory.
- 11) What is Parity bit ?
- 12) Define types of RAM.

SECTION – B

II. Answer any five questions : (5×5=25)

- 13) Explain the steps involved in design of combinational circuit.
- 14) Write a note on program counter and stack memory.
- 15) What is a Karnaugh Map ? Explain different types of Karnaugh Maps.
- 16) Explain any five register reference instructions.

P.T.O.



- 17) Write a note on Cache memory.
- 18) Compare CISC and RISC processors.
- 19) What are the Important characteristics of memory ?
- 20) Explain timing signals.

SECTION - C

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

- 21) Explain the types of program interrupts. 10
- 22) a) Simplify $F(A, B, C, D) = \sum m(1, 2, 4, 6, 8, 10, 12, 14)$ and draw a circuit diagram. 10
- b) What is a parity Bit ? Explain in brief. 5
- 23) Explain types of CPU organization. 6
- 24) a) Explain I/O commands. 6
- b) Explain common BUS organization of a Basic computer. 9
- 25) a) Explain Memory hierarchy. 6
- b) Explain different Addressing Modes. 9

SECTION - D

IV. Answer **any two** questions. (1×10=10)

- 26) a) Explain direct Address and Indirect Address Modes. 5
- b) Explain the working of R-S flip-flop. 5
- 27) a) Explain 8 to 3 Encoder. 5
- b) Discuss error detection and correction codes. 5



SN – 664

V Semester B.C.A. Degree Examination, Nov./Dec. 2017
(CBCS) (F + R) (2016-17 and 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) Write the symbol, logical expression and truth table of NAND gate.
- 2) Give the classification of integrated circuits.
- 3) Distinguish between RAM and ROM.
- 4) Define Multiplexer and Demultiplexer.
- 5) What are the types of binary codes ?
- 6) Subtract $24_{(10)}$ from $13_{(10)}$ using 2's complement method.
- 7) Define opcode and operand.
- 8) What is BUN instruction ?
- 9) What are the two types of computer architecture based on registers ?
- 10) What are the different types of interrupts ?
- 11) Define access time and transfer rate.
- 12) Define Baud rate.

SECTION – B

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

- 13) Explain the steps involved in the design of the sequential circuits.
- 14) Explain synchronous binary counter with logic diagram.
- 15) Discuss on error detection and correction codes briefly.
- 16) Explain any five register reference instructions.
- 17) With a block diagram, explain how BSA instruction executes.
- 18) Explain the addressing modes.
- 19) Explain DMA controller with a block diagram.
- 20) Write a note on virtual memory.

P.T.O.



SECTION – C

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

- 21) a) Simplify $F(ABCD) = \sum m(1, 3, 7, 11, 15) + \sum d(0, 2, 5)$ using K-map. 7
- b) What is a half adder ? Design a half adder using only NAND gates. 8
- 22) a) Explain decoder expansion with neat diagram. 7
- b) Discuss the parity generator and parity checker. 8
- 23) a) Explain common bus organization of basic computer with neat diagram. 8
- b) Distinguish between FGI and FGO. 7
- 24) a) What is a sub-routine ? Explain CALL and RETURN instructions. 8
- b) Explain the arithmetic logic shift with a neat diagram. 7
- 25) a) Explain I/O interface unit with a neat diagram. 8
- b) Write a note on isolated vs memory mapped I/O. 7

SECTION – D

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

- 26) a) Explain 4-bit shift register. 5
 - b) Explain the working of J-K flip-flop. 5
 - 27) a) Explain interrupt cycle with suitable example. 6
 - b) List the applications of EEPROM. 4
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NS – 613

V Semester B.C.A. Degree Examination, Nov./Dec. 2016
(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
 - 2) State and prove DeMorgan's theorem. 2
 - 3) Mention the different logic families of IC. 2
 - 4) Distinguish between RAM and ROM. 2
 - 5) What is Parity bit ? 2
 - 6) Write the BCD code for decimal number 8745.42₍₁₀₎. 2
 - 7) What are the two types of control organization ? 2
 - 8) Define program counter. 2
 - 9) Mention the major components of CPU. 2
 - 10) What is PSW ? 2
 - 11) What is Polling ? 2
 - 12) What is memory management system ? 2

SECTION – B

- II. Answer **any five** questions. **Each** carries **five** marks. (5×5=25)
- 13) Prove NAND and NOR gates as universal gates. 5
 - 14) Explain PIPO shift Register with a diagram. 5
 - 15) Discuss the Parity generator and Parity checker. 5
 - 16) Explain the operation of interrupt cycle with a flow chart. 5

P.T.O.

NS – 613



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|---|---|
| 17) Explain input-output instructions. | 5 |
| 18) Explain the three types of CPU organization. | 5 |
| 19) Explain the source initiated data transfer using handshaking with a block diagram and timing diagram. | 5 |
| 20) Write a note on memory hierarchy in a computer system. | 5 |

SECTION – C

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

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|---|----|
| 21) a) Define K-Map ? Simplify the following Boolean function using K-Map :
$F(A, B, C, D) = \sum(0, 2, 4, 6, 10, 11, 12, 13, 14, 15)$ | 8 |
| b) Explain different binary codes. | 7 |
| 22) a) Define counter. With a neat diagram explain 4-bit synchronous binary counter. | 8 |
| b) Explain octal to binary encoder with diagram. | 7 |
| 23) Explain the design of basic computer with flow chart. | 15 |
| 24) What is addressing mode ? Explain the different types of addressing modes with examples. | 15 |
| 25) a) Explain DMA controller with a block diagram. | 7 |
| b) Explain the working of associative memory. | 8 |

SECTION – D

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

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|--|---|
| 26) a) Explain the working of full adder. | 5 |
| b) Write a note on modes of data transfer. | 5 |
| 27) a) Explain the common bus system. | 5 |
| b) Write a note on RISC and CISC. | 5 |



UN – 323

V Semester B.C.A. Degree Examination, November/December 2015
(Y2K8 Scheme) (F + R)
Computer Science
BCA – 502 : COMPUTER ARCHITECTURE
(100 – 2013-14 & Onwards) (90 – Prior to 2013-14)

Time : 3 Hours

Max. Marks : 90/100

- Instructions:** 1) *Section A, B, C is common to all. Section D is applicable to the students of 2011-12 and Onwards.*
2) *100 marks for students of 2011-12 and onwards. 90 marks for Repeaters prior to 2011-12.*

SECTION – A

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

- 1) State and prove Demorgan's law.
- 2) Draw the logic diagram of the Boolean function $F = AB + A'B$ using NAND gates only.
- 3) What is Decoder Expansion ?
- 4) What is unidirectional and bidirectional shift register ?
- 5) Convert $(736.4)_8$ to decimal and binary.
- 6) What is self complementing code and weighted code ?
- 7) What are the two types of control organization ?
- 8) How many bits are needed to specify an address for a memory unit of 4096 words ?
- 9) What is PSW ?
- 10) What is an external interrupt ? Give an example.
- 11) What are peripherals ?
- 12) What is memory management system ?

P.T.O.



SECTION – B

II. Answer **any 4** full questions. **Each** full question carries **14** marks : (14×4=56)

11) Design a combinational logic circuit with 3 input x, y, z and the three output A, B, C. When the binary input 0, 1, 2 or 3, the binary output is one greater than the input ? When the binary input is 4, 5, 6 or 7 the binary output is one less than the input ? **14**

12) a) List all the unused combinations in BCD, 2421, Excess – 3 and Excess – 3 gray code. **(4+10)**

b) Derive a circuit for a 3 bit parity generator and a 4-bit parity checker using an even parity.

13) Explain with a neat block diagram how the basic computer registers are connected to a common bus. **14**

14) a) Explain 3 types of data manipulation instructions. With an example for each. **(6+8)**

b) What are addressing modes ? Explain the different types of addressing modes.

15) Explain the working of a basic computer with a neat flow chart. **14**

16) a) Explain the working of a DMA controller with a block diagram. **(7+7)**

b) Explain associative memory with a neat block diagram.