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V Semester B.C.A. Degree Examination, March/April - 2023

COMPUTER APPLICATIONS

Computer Architecture

(CBCS Scheme)

Paper : BCA 503T

Time : 3 Hours

Maximum Marks : 100

Instructions to Candidates:

Answer all sections.

SECTION-A

Answer any **Ten** questions. Each question carries 2 marks.

(10×2=20)

1. What is computer architecture?
2. Define minterm and maxterm.
3. What are weighted codes? Give example.
4. State Demorgan's theorem.
5. Write 2's complement of 11011000.
6. What is meant by Fan - in and Fan - out?
7. What is indirect address mode?
8. List the types of interrupts.
9. Define program counter.
10. What is meant by Band rate?
11. Mention the types of CPU organization.
12. Define Hit ratio.

[P.T.O.]



(2)

SECTION - B

(5×5=25)



Answer any **Five** questions. Each question carries **5** marks.

13. What are logic gates? Write the logic diagram and truth table of basic gates.
14. Explain half adder with a logic diagram.
15. Explain SIPO shift register.
16. Subtract +34 from -42 using 2's complement.
17. Explain any 5 memory reference instructions.
18. Differentiate between RISC and CISC.
19. Explain DMA controller with diagram.
20. Explain memory hierarchy.

SECTION - C

Answer any **Three** questions. Each question carries **15** marks.

(3×15=45)

21. a) Simplify $F(ABCD) = \sum m(1, 3, 7, 11, 15) + \sum d(0, 2, 5)$. (8)
- b) Define flip flop. Explain RS Flip flop. (7)
22. a) Explain the classification of IC's. (6)
- b) Explain error detection and correction codes. (9)
23. a) Explain common bus system with a neat diagram. (10)
- b) Explain different instruction formats. (5)
24. a) Explain different addressing modes. (10)
- b) Explain any five data transfer instructions. (5)
25. a) Explain Handshaking asynchronous data transfer. (10)
- b) What is virtual memory? Explain address space and memory space. (5)

SECTION - D

Answer any **One** question. Each question carries **10** marks.

(1×10=10)

26. a) Differentiate between Von Neumann and Harvard architecture. (5)
- b) Explain briefly 4 to 1 channel multiplexer. (5)
27. a) Explain types of ROM. (5)
- b) Explain cache memory. (5)



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COMPUTER SCIENCE
Computer Architecture
(CBCS Scheme)
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Instructions to Candidates:

Answer all the sections.



SECTION - A

(10×2=20)

I. Answer any Ten of the following.

1. Draw logical diagram of the boolean function $F = XY' + XY$.
2. Subtract 145 from 245 using 9's compliment.
3. What is BCD? give an example.
4. State any two rules of Boolean Algebra.
5. What are sequential circuits? List any two.
6. What are three control inputs for registers?
7. Define opcode & operand.
8. Explain BSA instruction.
9. List any two memory reference instructions.
10. List types of interrupts.
11. What is serial data transmission?
12. Define associatives memory.

SECTION - B

(5×5=25)

II. Answer any Five of the following.

13. Explain any five basic gates with logic symbols.
14. Solve using K-map $f(W, X, Y, Z) = \sum(0, 5, 7, 8, 11, 13, 15)$.
15. Explain the operations of instruction cycle with flow chart.
16. Explain any five register reference instructions.
17. Write a note on hamming code.

[P.T.O.]



18. Explain 3×8 priority encoder.
19. Explain DMA controller with block diagram.
20. Explain levels of cache memory.

SECTION - C

- III.** Answer any **Three** of the following. (3×15=45)
21. a. Explain construction of full adder using NAND gates. (8)
b. Explain different types of K-Map based on number of variables. (7)
 22. Explain Design of Basic computer with flow chart. (15)
 23. a. Explain memory reference instructions with control format. (10)
b. Explain types of CPU organisations. (5)
 24. a. Explain Asynchronous data transfer using parallel mode. (10)
b. Differential between Isolated I/O and memory mapped I/O. (5)
 25. a. Explain hard disk with neat diagram. (8)
b. What is a virtual memory? Explain address space and memory space in detail. (7)

SECTION - D

- IV.** Answer any **One** of the following. (1×10=10)
26. a. Explain direct and indirect address instructions. (5)
b. Differentiate between Von-neuman and Harvard architecture (5)
 27. a. Explain input - output configuration with a neat diagram. (8)
b. List any two conditional instructions. (2)
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V Semester B.C.A. Degree Examination, March - 2021
COMPUTER SCIENCE
Computer Architecture
(CBCS Scheme)

Time : 3 Hours

Maximum Marks : 100

Instructions to Candidates:

Answer All the Sections.

SECTION - A

I. Answer any Ten questions.

(10×2=20)

1. Write the logic symbol, expression and truth table of xor gate.
2. What is excitation table and give the excitation table of SR flip flop.
3. Draw the logical diagram of the boolean function $F = AB + A'B$.
4. Subtract 155 from 215 using 9's complement method.
5. What is self complementing code and give an example?
6. Distinguish between Memory reference and Input - output Instruction, with respect to their instruction formats.
7. Explain BUN instruction.
8. Distinguish between FGI and FGO.
9. What is PSW?
10. Define synchronous and Asynchronous data transfer.
11. Define Hit Ratio.
12. Mention the types of control organizations.

[P.T.O.]





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SECTION - B

II. Answer any **Five** questions.

(5×5=25)

13. Explain Octal to Binary Encoder with a diagram.
14. Design a 4-to-1 multiplexer.
15. Discuss briefly about Error Detection and Error correction code.
16. Explain Data transfer instructions of basic computer.
17. Explain the operation of Interrupt cycle with a flowchart.
18. Explain Source - initiated data transfer using handshaking.
19. Explain DMA controller with a block diagram.
20. Write a note on memory hierarchy in a computer system.



SECTION - C

III. Answer any **Three** questions.

(3×15=45)

21. a) Explain the full adder circuit with truth table.
b) Simplify $F(A,B,C,D) = \sum m(1,3,7,11,15) + \sum d(0,2,5)$ using K-map.
22. a) Explain the working of 3-bit odd parity generator and checker with logic diagram.
b) Explain the procedure to perform 2's complement subtraction with relevant example.
23. a) Explain the timing and control unit of basic computer with a neat diagram.
b) Explain register reference instructions.
24. a) Explain the types of Computer Instructions based on number of addresses.
b) Compare the RISC and CISC architectures.
25. a) Explain the working of Associative memory.
b) What is a subroutine? Explain CALL and RETURN instruction.

SECTION - D

IV. Answer any **One** question.

(1×10=10)

26. a) Explain the Universal property of NAND gate.
b) Explain the working of J-K Flipflop.
27. Explain the bus system organization for CPU registers with a neat diagram.