C003 - Computer Systems

Standard Student Answer Sheet

Name: _____ Index No: _____

Date: _____

Task 01: Number System Conversions

Q1a - Binary to Octal and Hexadecimal

Answer:

1011011101 →

1101100111 →

10011010 →

1011011101 →

1101100111 →

10011010 →

Q1b - Octal to Binary and Hexadecimal

Answer:

3502 → 011101000010

1006 → 001000000110

2234 → 010010011100

4321 → 100011010001

6753 → 110111101011

3502 → 1D12

1006 → 206

2234 → 24E

4321 → 1A1

6753 → 37B

Q1c - Hexadecimal to Binary and Octal

Answer:

C74 → 110001110100

53F → 010100111111

B132 → 1011000100110010

1AFE → 0001101011111110

C74 → 14364

53F → 12377

B132 → 130314

1AFE → 15376

Q1d - Decimal to Binary and Octal

Answer:

155 → 10011011

3336 → 110100001000

759 → 101111011

155 → 233

3336 → 6500

759 → 1367

Task 02: Logic Expressions and Control System

INSTRUCTIONS (Important):

- Write Boolean expressions clearly using symbols like ·, +, ~ and parentheses.
- For Q2a_tt1 to Q2a_tt3, give only the 8-bit output values. DO NOT write full truth tables.
  Example: Q2a_tt1
  Answer:
  00000011

- For Q2b_tt, use the format: 4-bit input → output.
  Example:
  0000 → 0
  0001 → 1
  0010 → 1
  (continue up to 1111)

- For Boolean Equation (Q2b_eqn), write in proper logical form using + and variables.
  Example:
  X = A + B + C + D

- For Circuit Diagram (Q2b_circuit), describe the logic in simple sentence.
  Example:
  Connect A, B, C, and D to a 4-input OR gate to get output X.

Q2a_expr1

Answer:

(A·B·C) + (A·(~B + ~C))

Q2a_tt1

Answer:

00000011

Q2a_expr2

Answer:

(P·(~Q + R)) + Q

Q2a_tt2

Answer:

00011111

Q2a_expr3

Answer:

(~(P·Q) + (P·R)) · ~R

Q2a_tt3

Answer:

10110100

Q2b - Temperature Control System Truth Table

Q2b_tt

Truth Table:

Answer:

0000 → 0

0001 → 1

0010 → 1

0011 → 1

0100 → 1

0101 → 1

0110 → 1

0111 → 1

1000 → 1

1001 → 1

1010 → 1

1011 → 1

1100 → 1

1101 → 1

1110 → 1

1111 → 1

b) Boolean Equation:

Q2b_eqn

Answer:

X = A + B + C + D

c) Circuit Diagram:

Q2b_circuit

Answer:

Connect A, B, C, D to a 4-input OR gate to get X as the output.

Task 03: Hotel IT Configuration

Q3a

Answer: xeon epyc ecc ssd raid pos ups firewall

Q3b

Answer: windows ubuntu security erp domain integration

Task 04: Microprocessor

Q4a

Answer: alu control registers cache clock bus decoder pc

Q4b

Answer: executes instructions, performs calculations, controls data, coordinates ops

Q4c

Answer: ALU fast, cache reduces latency, registers quick access, clock speed, pipelining

1011011101 → 1355

1101100111 → 1567

10011010 → 232

1011011101 → 2DD

1101100111 → 1B3

10011010 → 9A

3502 → 011101000010

1006 → 001000000110

2234 → 010010011100

4321 → 100011010001

6753 → 110111101011

3502 → 1D12

1006 → 206

2234 → 24E

4321 → 1A1

6753 → 37B

C74 → 110001110100

53F → 010100111111

B132 → 1011000100110010

1AFE → 0001101011111110

C74 → 14364

53F → 12377

B132 → 130314

1AFE → 15376

155 → 10011011

3336 → 110100001000

759 → 101111011

155 → 233

3336 → 6500

759 → 1367

(A·B·C) + (A·(~B + ~C))

00000011

(P·(~Q + R)) + Q

00011111

(~(P·Q) + (P·R)) · ~R

10110100

0000 → 0

0001 → 1

0010 → 1

0011 → 1

0100 → 1

0101 → 1

0110 → 1

0111 → 1

1000 → 1

1001 → 1

1010 → 1

1011 → 1

1100 → 1

1101 → 1

1110 → 1

1111 → 1

X = A + B + C + D

Connect A, B, C, D to a 4-input OR gate to get X as the output.

Xeon processor, 64GB RAM, ECC memory, SSD, RAID setup, POS system, Scanner, Printer

Windows Server for the main server and Ubuntu/Linux Mint for functional computers

ALU, Control Unit, Registers, Cache, Clock, System Bus, Instruction Decoder, Program Counter

Executes instructions, performs calculations, controls data flow, and handles logic operations

Cache and registers for speed, clock for cycles, pipelining and multicore for parallel tasks