

(2)

4. Using the proper logic diagram show that a full-adder is a combination of half-adders. 10
5. (a) What are BCD and ASCII ? 4
(b) Convert as directed : 6
(i) $236_{10} = ?_8$
(ii) $11011.11_2 = ?_{10}$
(iii) $BAB_{16} = ?_{10}$
6. (a) Discuss the essential features of an algorithm. Take one example. 6
(b) What is D/A converter ? 4
7. (a) Draw and explain the circuit of an 8×1 multiplexer. 6
(b) What is K-map? Explain its importance. 4
8. Write short notes on (any two) : $5 \times 2 = 10$
(a) Demultiplexer
(b) Fixed point vs. floating point arithmetic
(c) Structured programming
(d) Alphanumeric codes.

P-1(1+1+1)G/11

2011

COMPUTER SCIENCE (General)

First Paper

Full Marks : 50

Time : Two Hours

The figures in the margin indicate full marks.

Answer any five questions.

1. (a) Explain the differences between sequential and combinational circuits. 4
(b) Draw a block diagram of a typical digital computer and each block's functionality. 6
2. (a) Explain the terms with example(s) : hardware, software and firmware. 6
(b) What is a flowchart ? Discuss the importance of flowchart in programming. 4
3. (a) Explain 1's and 2's complement schemes with examples. 4
(b) Define 'overflow' and 'underflow' with illustrations. 4
(c) What do you mean by Third generation computers? 2

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4. (a) What is proposition? Explain with the help of an example. $2+2=4$
- (b) Explain Min-term and Max-term. 4
- (c) What is boolean value? 2
5. (a) Draw the symbol of AND gate? 2
- (b) What is XOR gate? Write down the truth table for XOR gate. $2+2=4$
- (c) Explain combinational circuits. 4
6. (a) What is parity bit? Draw the circuit for even parity generator. $2+4=6$
- (b) Differentiate between D and edge triggered D flip flop. 4
7. (a) Draw and explain the circuit of an 4×1 multiplexer. 4
- (b) Explain the significance of K-map with the help of an example. 4
- (c) What is A/D converter? 2
8. Write short notes on any two of the following : $5 \times 2 = 10$
- (a) EBCDIC
- (b) Comparator
- (c) Schmitt-trigger.

P-I(1+1+1)G/12

2012

COMPUTER SCIENCE (General)

First Paper

Full Marks : 50

Time : Two Hours

The figures in the margin indicate full marks.

Answer any five questions.

1. (a) Draw the basic block diagram of computer system. 3
- (b) What is super computer? 2
- (c) Explain software hierarchy. 5
2. (a) What is pseudo code? Write down a pseudo code to add first ten natural numbers. $2+4=6$
- (b) Write an algorithm to find out first ten prime numbers. 4
3. (a) Explain positional and non positional number system. 4
- (b) Convert the following octal numbers into equivalent hexadecimal numbers. 6
- (i) 234_8
- (ii) 645_8
- (iii) 430_8

P.T.O.

2014
COMPUTER SCIENCE (General)
First Paper

Full Marks : 50

Time : Two Hours

The figures in the margin indicate full marks.

Group - A

1. Answer any *five* questions : 2×5=10
- (a) What is sign-magnitude ?
 - (b) Discuss briefly E²PROM.
 - (c) What do you understand about fixed point numbers ?
 - (d) Write the name of non universal gates.
 - (e) What is encoder ?
 - (f) What is Max-term expressions ?
 - (g) What is use of flip-flop ?

Group - B

Answer any *four* questions :

2. (a) What is pseudo codes ? What is its need in Computer Science ? 1+5
- (b) What is Algorithm ? What is its importance ? 4

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3. (a) Simplify the following boolean equation : $3 \times 2 = 6$

(i) $abcd' + ab'c'd + abc'd' + abcd.$

(ii) $(a+b'+c')(a+b'+c)(a'+b+c)(a+b+c')$

(b) Write short notes on propositional logic. 4

4. (a) What do you mean by weighted code ? Discuss. 4

(b) Convert the following hexadecimal nos. to decimal system.

(i) $(A\ 3\ BE)_{16}$

(ii) $(27\ BFD)_{16}$

(iii) $(9\ ACD)_{16}$ $2 \times 3 = 6$

5. (a) What is main memory ? Why cache memory is needed ? Are we use cache memory or main memory ? 6

(b) What is the drawback of ROM ? Write some difference between RAM and ROM. 4

6. (a) Convert maxterm to minterm —

$$f(a, b, c, d) = ab'cd' + abcd' + bc'd + ab'c + ab'cd + abcd. \quad 4$$

(b) What is Master Slave flip-flop? 2

(c) Convert JK flip-flop to T flip-flop. 4

(3)

7. (a) Draw the truth table of X-NOR Gate and AND Gate. 2

(b) Write short note : 4 \times 2 = 8

(i) Shift register.

(ii) Subtractor.

2015

COMPUTER SCIENCE (General)

First Paper

Full Marks : 50

Time : Two Hours

The figures in the margin indicate full marks.

Answer question no. 1 and any *four* from the rest :

1. Answer the following questions : 1×10=10

(a) Which of the circuits selects one of the several inputs and passes it to the output ?

- (i) Multiplexer
- (ii) Demultiplexer
- (iii) Encoder
- (iv) Decoder

(b) A/An_____ gate can be used as universal gate.

- (i) OR
- (ii) XOR
- (iii) AND
- (iv) NAND

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- (c) Which of the following languages follows structured programming concepts ?
- (i) BASIC
 - (ii) PASCAL
 - (iii) FORTRAN
 - (iv) C
- (d) Which of the following representations of binary number exhibits two values of zero ?
- (i) Sign-magnitude
 - (ii) 1's complement
 - (iii) Both (i) & (ii)
 - (iv) None of them
- (e) BIOS is a _____
- (i) Hardware
 - (ii) Software
 - (iii) Firmware
 - (iv) Netware
- (f) The binary equivalent of $(.625)_{10}$ is —
- (i) $(.110)_2$
 - (ii) $(.001)_2$
 - (iii) $(010)_2$
 - (iv) $(.101)_2$

(3)

- (g) Master-slave flip-flop avoids —
- (i) Racing
 - (ii) Race condition
 - (iii) Propagation delay
 - (iv) toggling
- (h) The main components of a 2nd generation computer were the —
- (i) Vacuum tubes
 - (ii) Transistor
 - (iii) MSI Chip
 - (iv) Relays
- (i) The operating system is a/an —
- (i) Hardware component
 - (ii) System Software
 - (iii) Application Software
 - (iv) Utility Software
- (j) Which of the following does not belong to octal number system ?
- (i) 1101
 - (ii) 2000
 - (iii) 792
 - (iv) 222

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(4)

2. (a) What is the function of a multiplexer ? Draw and explain the logic circuit of 8×1 multiplexer. 2+4=6

(b) What is a multivibrator ? 2

(c) Explain underflow with a suitable example. 2

3. For the Boolean expression

$$\overline{A}B\overline{C} + \overline{A}\overline{B}\overline{C} + \overline{A}B\overline{C} + \overline{A}B\overline{C} + A\overline{B}\overline{C} + A\overline{B}\overline{C}$$

(i) draw the logic circuit ;

(ii) reduce using k-map ;

(iii) draw the reduced logic circuit. 3+4+3=10

4. (a) Explain 1's and 2's complement schemes with example. 4

(b) What is K-map ? Explain its importance. 4

(c) What do you mean by 5th generation ? 2

5. (a) Convert the following octal numbers into equivalent hexadecimal numbers. 6

(i) $(243)_8$

(ii) $(564)_8$

(iii) $(403)_8$

(b) Explain positional and non-positional number system. 4

(5)

6. (a) Explain parity generator. 4

(b) What is XOR gate ? Write down the truth table for XOR gate. 2+2=4

(c) Draw the symbol of AND gate. 2

7. For a 4-input XOR operation —

(a) Write down the truth table.

(b) Write down the minterm and maxterm expressions.

(c) Draw the logic circuit for minterm expression. 3+(2+2)+3=10