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*) : 5×2=10

(a) Demultiplexer

(b) Fixed point vs. floating point arithmetic

(c) Structured programming

(d) Alphanumeric codes.

P-I(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

P.T.O.

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 : 5×2=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) $2\ 3\ 4_8$

(ii) $6\ 4\ 5_8$

(iii) $4\ 3\ 0_8$

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 E^2PROM.

(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

P.T.O.

3. (a) Simplify the following boolean equation : 3×2=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 prepositional 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) $(9\ ACD)_{16}$ 2×3=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 —

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

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

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

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

(b) Write short note : 4×2=8

(i) Shift register.

(ii) Subtractor.

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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

(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) $(.101)_2$

(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) Vaccum 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

P.T.O.

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

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

(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

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
