2016

COMPUTER SCIENCE

[GENERAL]

Paper : I

Full Marks : 100 Time : 3 Hours

The figures in the right-hand margin indicate marks.

Candidates are required to give their answers in their own words as far as practicable.

1. Answer any **eight** questions: 2×8=16

   i) What is computer?

   ii) Define operating system.

   iii) Convert $(4A.67)_{16}$ to binary.

   iv) Define De-Morgan's Theorem.

   v) Draw circuit diagram of X-OR gate.

   vi) What is encoder?

   vii) What is ternary operator?

   viii) Define function.

   ix) What is a Sequential Circuit?

   x) What is pointer?

   xi) What is meant by context Switching?

GROUP–A

Answer any **six** questions: 6×6=36

2. a) Give the difference between Analog and Digital Computer.

   b) Write three applications of Computer. 3+3=6

3. a) What are meant by the 1's and 2's complement of a binary number? Give the 2's complement of the number 11001101.

   b) Convert the decimal number $(379)_{10}$ to BCD. 2+2+2=6

4. a) Realise the logic expression

   $Y=(A+B)(\bar{A}+C)(B+D)$ using basic gates.

   b) Simplify the Boolean expression to its canonical POS form (xy+z).(y+xz). 3+3=6

5. Implement a full adder circuit using a decoder and two OR gates. 6

6. Simplify the following logic expression :

   a) $(\bar{A}+B+\bar{C})(\bar{A}+B+D+E)(C+D)$

   b) $\bar{A}\bar{B}C+BC+AC$ 3+3=6

7. What is flip-flop? What advantages does a J-K flip-flop has over on S-R flip-flop? 2+4=6

8. Describe the function of an Operting System. 6

9. a) What is CPU schedulig?

   b) Compare between Preemptive and non-preemptive scheduling. 2+4=6

10. a) Differentiate between long term scheduler and short term scheduler.

    b) What is swapping? 4+2=6

GROUP–B

Answer any **four** questions: 12×4=48

11. a) What is hardware? List the components of computer hardware and explain its functioning. 1+6=7

    b) Describe classification of a Digital Computer. 5

12. a) What do you mean by Universal logic gates? 2

    b) What is K-map? Using K-map simplify the following expression :

    $f(w, x, y, z)=\Sigma(8, 10, 11, 12, 13, 14, 15)$ 2+8=10

13. a) What is a multiplexer? Construct on 8 to 1 MUX and describe its operations. 2+6=8

    b) Differentiate between encoder and decoder. 4

14. a) Explain the function of D flip-flop using a suitable diagram.

    b) Write down the difference between register and counter. 7+5=12

15. Explain different loop structures in C with examples. 12

16. a) What is process? Describe state of a process.

    b) What is process control block? 2+8+2=12

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