WEST BENGAL STATE UNIVERSITY
B.Sc. General PART-I Examinations, 2018

COMPUTER SCIENCE-GENERAL

PAPER-CMSG-I

Time Allotted: 3 Hours   Full Marks: 100

The figures in the margin indicate full marks.
Candidates should answer in their own words and adhere to the word limit as practicable.

1.   Answer any *ten* questions from the following: 2×10 = 20

(a) Simplify $x'y + x'yz + z$

(b) What do you mean by addressing mode?

(c) What are the differences between static and dynamic RAM?

(d) What do you mean by multitasking operating system?

(e) What do you mean by GUI?

(f) What are the phases of Instruction Cycle?

(g) What is the advantage of 2's complement representation over 1's complement representation?

(h) What is the function of OMR?

(i) Explain LIFO in terms of stack.

(j) What is ripple counter?

(k) How are binary codes converted to grey codes?

(l) How is class related with object?

(m) Explain XOR gate with truth table.

(n) What is demand paging?

(o) What is stack point register?

Group-A

Answer any *two* questions from the following   16×2 = 32

2. (a) Compare between single-pass assembler and two-pass assembler.   3

   (b) Distinguish between compiler and interpreter.   4

   (c) Write short note on Von Newman architecture.   4

   (d) Draw the block diagram of a CPU.   3

   (e) Define operating system.   2

3. (a) Explain max heap and min heap with examples.   3

   (b) Write an algorithm to delete a node from a doubly linked list. The node can be anywhere of the linked list.   6

   (c) Draw a flow chart to find LCM and HCF of two given numbers.   4

   (d) Describe the big-oh notation.   3

4. (a) Sort the following elements using Quick Sort.   6

      55, 88, 22, 44, 33, 11, 77, 110, 66, 99

   (b) Define a Max-Heap.   2

   (c) How a sparse matrix is represented using a Linked List?   3

   (d) Illustrate the concept of a Priority Queue and a Dequeue with example.   5

Group-B

Answer any **two** questions from the following $16 \times 2 = 32$

5. (a) Perform $(-19)_{10} + (-25)_{10} = (?)_2$. Use 2's complement method after converting the input number in binary.   4

   (b) Design a 2-input XOR gate using Four (4) 2-input NAND Gates only. Show only the circuit diagram mentioning intermediate results.   4

   (c) $f = \sum(2, 4, 8, 12, 15) + \phi(3, 7, 13)$ 8

      Realize a circuit producing f as output using only NOR gates, after minimizing the expression by means of K-Map.

6. (a) Describe and implement any one universal gate for all basic gates (with diagram).   6

   (b) Draw and explain (with truth table) full adder using two half adders.   4+2

   (c) Design a 3-to-8. Decode using NAND gates only.   4

7. (a) What do you mean by race around condition of JK flip-flop?   4

   (b) What is register?   2

   (c) Name four special purpose register in CPU.   4

   (d) $(1010100)_2 - (1000100)_2 = ?$ (using 1's complement)   4

   (e) $(1.0101)_2 = (?)_{10}$ 2

Group-C

Answer any **one** question from the following $16 \times 1 = 16$

8. (a) What is virtual memory?   4

   (b) Differentiate between paging and segmentation.   4

   (c) What is kernel and briefly explain its function.   4

   (d) What is shell in terms of UNIX?   4

9. (a) Write down the different Process States.   5

   (b) What is PCB?   3

   (c) What is job queue and ready queue?   4

   (d) What do you mean by context switch?   2

   (e) What is Co-operating process?   2

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