2021

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.

GROUP–A

1. Answer any **six** questions: 1×6=6

    i)   What is the purpose of linker?

    ii) What do you mean by system software?

    iii) What is the purpose of http?

    iv) What is web browser?

    v)   What is the disadvantage of interpreter?

    vi) What is the difference between multitasking and multiprogramming?

    vii) What is web server?

    viii) What is timesharing?

GROUP–B

2. Answer any **eleven** questions: 2×11=22

    i)   Why page size is always power of 2?

    ii) What is hit ratio and miss ratio?

    iii) What is segment table?

    iv) What is dirty bit in page table?

    v)   Convert $(A3F4B7)_{16}$ to decimal.

    vi) What do you mean by thrashing?

    vii) What is the TLB?

    viii) What is the purpose of circular queue?

    ix) What is the advantage of linked list over array?

    x)   Why memory address is represented in hexadecimal form?

    xi) What is segmentation?

    xii) What is write through and write back cache?

    xiii) What do you mean by response time in CPU scheduling?

GROUP–C

3. Answer any **seven** questions: 6×7=42

    i)   Convert the following infix expression into equivalent prefix expression using stack. Clearly mention each step.

         ((A+B/C)-D*C)/(E*F/G))   6

    ii) Write an algorithm to check two binary trees are mirror image to each other or not?   6

    iii) Write an algorithm to represent a queue using two stacks.   6

    iv) Briefly discuss the different phases of instruction cycle.   6

v)   What is interrupt? Briefly explain about different types interrupts.   6

vi) Describe Round Robin scheduling algorithm with the help of the following example and determine the average turned around time and waiting time.   6

Process	CPU Burst Time (ms)	Arrival time (ms)
P_0	6	2
P_1	1	3
P_2	7	8
P_3	3	1
P_4	15	10

vii) Why 8085 is known as 8 bit microprocessor? Describe different flags present in 8085 microprocessor.   2+4

viii) Briefly discuss about different fields of IP datagram header   6

ix) What is the difference between guided media and unguided media? Briefly discuss the characteristics of twisted pair cable.   2+4

GROUP–D

Answer any **three** questions: 10×3=30

4. i) Prove that a perfect binary tree of height h has $2^{h+1}-1$ nodes.   4

    ii) What is extended binary tree?   2

iii) Draw the corresponding tree whose

Postorder Traversal:	D	B	G	E	H	I	F	C	A
Inorder Traversal:	D	B	A	E	G	C	H	F	I

4

5. i) Write the advantage of Circular Queue over non circular queue.   2

    ii) Write a program to implement a circular queue using linked list.   8

6. Write short notes on (any **two**):   5×2=10

    i)   Instruction fotmats

    ii) Virtual Memory

    iii) Binary Tree and their operations

7. i) Briefly explain fixed variable partition allocation scheme in the context of memory management.   6

    ii) What is fencing register? What is the roll in and roll out?   2+2

8. i) What is reflected code?   2

    ii) Solve the K-Map
        $F(W,X,Y,Z)=\pi\,(0,1,2,3,5,9,10,11,12,13,14,15)$
        6

    iii) What is the difference between minterm and maxterm of a Boolean expression?   2

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