2016

COMPUTER SCIENCE (Honours)

Paper Code : II-B

[New Syllabus]

Full Marks : 40 Time : One Hour Forty Minutes

The figures in the margin indicate full marks.

Group - A

Answer any *two* questions.

1. (a) Suppose an array arr [–10 ... 69] is stored in a memory whose starting address is 1500. Assume that the word size for each element is 2. Then find out the following :

(i) What is the location of arr [30] ?

(ii) What is the size of the array ?

(b) Write down a recursive algorithm to implement binary search on an array of elements.

(c) What are the limitations of linked list ? 3+5+2

2. (a) Convert the following expression into post fix notation :

$A + (B * C) - D/E$

(b) Write an algorithm that performs the INSERT and DELETE operation in a Queue.

(c) What is an algorithm ? Mention the different characteristics of it. 3+(2+2)+3

3. (a) Write an algorithm that inserts an element in a circular linked list.

(b) What is Divide-and-conquer algorithm ?

(c) What is the difference between linear data structure and non-linear data structure ? Give example. 5+2+3

Group - B

Answer any *two* questions.

4. (a) What is pointer ? Write a function in C that interchanges the value of two integer variables.

(b) Give the output and explain.

```
int main ( )
{  int  i = 100;
   printf ("%d %d %d", i + 1, ++i, i++);
   return 0;
}
```

(c) What is type casting ? (1+4)+3+2

5. (a) What is the purpose of main ( ) function ?

(b) What is the difference between getche ( ) and getch ( ) ?

(c) Write a C program which deletes the duplicate element of an array. 3+2+5

6. (a) What is the difference between string and array ?

(b) What is a Modulas operator ? What are the restrictions of Modulas operator ?

(c) Discuss about the scope and lifetime of static and external storage class. Give a small program statement showing how to access these variables.

(d) What is equivalent expression of $x \% 8$? 2+3+4+1

2018

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[New Syllabus]

Full Marks : 40 Time : One hour Forty minutes

The figures in the margin indicate full marks.

Answer any *four* questions taking *two* from each group.

Group - A

1. (a) Write an algorithm that prints the data of singly linked list reversly without reversing the linked list.

   (b) What are the advantages and disadvantages of linked list over array? (5+5)=10

2. (a) Define queue. Write the disadvantages of array representation of queue.

   (b) Write an algorithm that performs the following operations on a circular queue :

   (i) Insert an element first.

   (ii) Delete an element first. (2+2)+(3+3)=10

3. (a) How many elements are there in a upper-triangular matrix of order n × n. Obtain the address of element $a_{ij}, 1 \le i, j \le n$, using row major order.

   (b) Write an algorithm that performs selection sort on an array of 'n' elements. Describe it with suitable example. (2+2)+(3+3)=10

Turn Over

Group - B

4. (a) Write a function in C that takes an integer number as input and checks whether its i^{th} bit in binary is zero (0) or one (1), where i must be provided by the user.

   (b) Why break statement is used in switch-case statement?

   (c) What is macro substitution? (5+3+2)=10

5. (a) Differentiate between structure & union.

   (b) Write a program in C that creates a new structure named point, having x and y co-ordinates. Now write a function that adds two points.

   (c) What is the function of strcmp? (4+4+2)=10

6. (a) What is command line arguments? Discuss with the help of an example.

   (b) Differentiate between call by reference & call by value.

   (c) Write a function in C that copies all the contents of a text file to another text file. (3+3+4)=10
