

(Set-1)

B.Tech-2nd**Programming & Data Structure***Full Marks : 70**Time : 3 hours*

Answer any six questions including Q. No. 1

*The figures in the right-hand margin indicate marks*1. Answer the following questions : 2 × 10

- (a) What are primitive data types ? Explain them with examples.
- (b) How do stat(), fstat(), vstat() work ? How to check whether a file exists ?
- (c) What are the differences between formal arguments and actual arguments of a function ?
- (d) How can multiple assignments be written in C ? In what order will the assignments be carried out ?

(e) What is the purpose of the keyword void ? Where is this keyword used ?

(f) How can the size of a structure be determined ? In what units is the size reported ?

(g) What is the difference between the & and && operators and the and operators ?

(h) What is a NULL pointer ? What is a null pointer assignment error ?

(i) Translate the following infix expression to post fix expression :

$$A - B \cdot C - D ^ { \wedge } 7 \cdot S T - Q$$

(j) What is a Data Structure ? How are data structures classified ?

2. (a) What are the six basic methods of converting values from one data type to another in C ? 5

(b) Write a C program to print 100 odd integers starting from 1 and sum of those odd integers. 5

3. (a) What is a NULL pointer ? How is a NULL pointer defined ? Write a program in C to exchange the values of a and b using pointer ? 5

(b) Define linear queue ? Let QUEUE be a non-empty Queue implemented using linear array. Write a C program to insert element to the Queue ? 5

4. (a) Compare the use of switch statement with the use of nested if-else statements. Which is more convenient ? What is the purpose of the break statement ? 5

(b) Write a program in C language to compute sum of the series $S = 2 + 4 + 8 + \dots + 2^n$. 5

5. (a) What is a structure ? A company maintains the record of their employees as : Name, designation, Details of the pay like Gross pay, Provident Fund deductions, Professional tax and the Net pay. Keep the details of the pay within a separate structure. Suggest suitable structure declaration in C for record of the employees ? 5

(b) Write a program to find the number and sum of all integers from 100 to 200 and divisible by 7. 5

6. (a) Define STACK. Write a C function for PUSH and POP for the STACK implemented in linear array 5

(b) What is the difference between declaring a variable and defining a variable ? What is a register variable ? What is scope and storage allocation of extern and global variables ? 5

7. (a) What is the purpose of a function prototype ? How to declare an array of N pointers to functions returning pointers to functions returning pointers to characters ? 5

(b) Write a program to find factorial of the given number using recursion ? Which type of recursions are suitable to be implemented using C ? 5

8. (a) What is the difference between 'for' and 'while' loops in C ? 2 $\frac{1}{2}$

- (b) What is the purpose of main() function ?
Explain command line arguments of main
function. 2½
- (c) What is a pointer in C ? What are the
differences between malloc() and calloc() ? 2½
- (d) Define circular queue. Sketch to explain the
placement of FRONT and REAR pointers
when Queue is Full and empty Queue. 2½
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