BITS, Pilani – Dubai
Dubai International Academic City,Dubai
First Semester 2008 – 09

Nos. of Question: 15

Test – 1 (Closed Book)

Course Number & Title	:	**TA C252 – Computer Programming – II**
Weightage	:	20 %
Duration	:	50 minutes
Date & Day	:	21-9-2008, Sunday

Note
Answer the questions **sequentially.**

1. State true or false: (0.5 M)
   Structure elements can be initialized during the declaration of the structure.

2. (0.5 M)
```
struct dob
{
   int day;
   int month;
   int year;
};
struct dob d;
```
Using above declaration which of the following refers to month
   i. dob.month
   ii. dob->month
   iii. d.month

3. What will be the output of the following? (0.5 M)
```
void main()
{
        struct bits
        {
                int bits;
        };
        bits bits;
        bits.bits = 1000;
        printf("Bits = %d",bits.bits);
}
```

4. Point out the error in the following code. (1 M)
```
struct A
{
```

```
    int x;
    float y;
} z1;

struct B
{
    int x;
    float y;
} z2;

main()
{
        z2.x = 10;
        z2.y = 20;
        z1 = z2;
}
```

5. Given the statement (0.5 M)

college.department.eee

i. Structure eee is nested within structure department.
ii. Structure department is nested within structure college.
iii. Structure college is nested within structure department.
iv. Structure college is nested within structure department.

6. .State whether TRUE or FALSE (0.25X2=0.5M)

a).it is legal to copy a content of a structure variable to another structure variable of the same type

b).An Array cannot be used as a member of a structure

7 .Given the declaration (0.5X4=2M)

```
struct item_bank
{
    int number ;
    double  cost ;
};
```

Which of the following are correct statements

a) int item_bank items[10];
b) struct items[10] item_bank ;
c) struct item_bank items [10];
d) sturct items item_bank[10] ;

8 .Given the following declaration (0.25X2=0.5M)

```
typedef  struct abc
```

```
{
   char x ;
    int y;
    float z[10] ;
 } ABC ;
```

State which of the following declarations are invalid ? why?

a) struct abc V2[10] ;
b) ABC a[10];

9 . a. Ford company plans to launch a new brand of ford focus, but the new price of the car is hiked by AED 6,000. Write a program using structures to store details of all the ford vehicles. Write an update function where only the price of the ford focus is increased. The details of the car to be stored in the structure include Model No, Model Name and price. 3M

b. What are the alternative techniques for passing a structure to the function ? Show the calling function for any one technique for the above program. 1M

10. List down all the similarities and difference between union and structures with suitable example. (2 M)

11.Interpret the coding segment given below and give the initialization process that takes place for the element of the union. (1 M)

```
union fun
   {
    struct
        {
                int value3;
                float value4;
        } strvar;
    char choice[10];
};

union fun data = { 3331, 15.0};
```

12. Write a C program to declare the members of a structure using bit fields data type and to display the contents of the structure. The structure members are: an integer variable and a floating point variable. (1 M)

13. Give any two applications of pointers. (2 M)

14. Find the output of the following program segment

```
float a=3.0, b = -17.0;
float *fp;
fp = &b;
b++;
*fp = *fp – 2.0;
a = * fp;
a++;
```

What is the value of the variables **a** and **b** at the end ? (2 M)

15. Assuming value of pointer p is the memory address 1000, write the output of the following two program segments.

a.
```
int a = 3, *p;
p = &a;
printf("%d", ++*p);
```

b.
```
int a = 3, *p;
p = &a;
printf("%d", *p++);
```
(2 M)

********** ALL THE BEST**********

BITS, Pilani - Dubai
International Academic City, Dubai
I– Semester 2008-2009

Number of Pages : 3

Sections : A, B, C, D,E

Course Number	:	**TA C252**
Course Name	:	**Computer Programming - II**
Nature of Component	:	**Test 2 – Open book**
Weightage	:	20%
Max. Marks	:	20 Marks
Duration	:	50 minutes
Date of Examination	:	**09.11.2008**

Note: 1) Answer all questions
2) All parts of the question should be answered consecutively. Each answer should start from a fresh page.

SECTION – A

1. Write a program to create a **file** that could store details **of** about 3 products, Details include product_code, cost and number of items available.(given as below) Also display the same . (1.5M)
Compute and print the total value of all the 3 products, (1M)
If cost and number of items are as given below

Product_code	Cost	Number of items
123	55	759
XYZ	0.35	522
ABC	9.5	12

2. What does the following statement do (0.75M)

a) ----------
-----for(i=1; i<=5; i++)
{
fscanf(stdin, "%s", name);
fprintf(fp, "%s",name);
}

b) while((c=getchar( )!=EOF)) (0.75M)
putc(c,f1);

SECTION – B

1. a. Write a program using dynamic memory allocation to create memory space to store integer values 3,6,9 .The memory location to store the integers is created one at a time, the contents displayed and the details are deleted immediately. 1.5M

b. In the above program are the three blocks of memory created sequentially or at random ? 0.5M

SECTION – C

1. Write a program with function GetNth() that takes a linked list and an integer index and returns the data value stored in the node at that index position. GetNth() uses the C numbering convention that the first node is index 0, the second is index 1, ... and so on. So for the list {42, 13, 666} GetNth() with index 1 should return 13. the index should be in the range [0..length-1]. If it is not, GetNth() should print an error. (2 M)

2. Write a program to create a linked list of student's information, which contains roll no, and marks for a subject. Display the contents of the linked list after the creation of the linked list with n nodes. (2 M)

3. Write appropriate structure definition for each of the following: (2 * 1 = 2 M)

   a. Define a linked list called book, which contains following fields:
      Bookno (integer)
      Price (float)
      Author (25 characters)
   b. Define a linked list called student, which contains following fields:
      Name (20 characters)

SECTION – D

1. Imagine we have a stack of integers **s** and a queue of integers **q.** Draw a picture of **s** and **q** after all the following sequence of consecutive operations:- (2 M)

   pushstack(s,3)
   pushstack(s,12)
   enqueue(q,5)
   enqueue(q,8)
   popstack(s,x)
   pushstack(s,2)
   enqueue(q,x)
   dequeue(q,y)
   pushstack(s,x)
   pushstack(s,y)

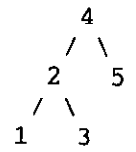
   where the second argument to popstack() and dequeue() is the item poped from the stack and the item deleted from the queue respectively.

2. Using stack operations, write a C program to convert a given decimal number to binary. (1.5 M)

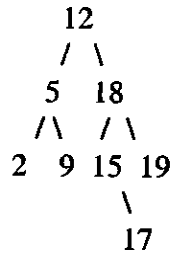
3. Convert the following infix expression to postfix
   (A * B) – (C + D) + E /5 (0.5 M)

SECTION – E

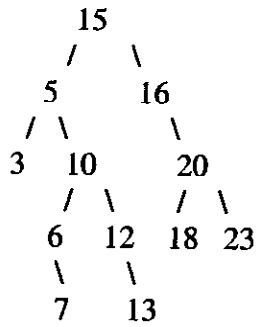
1. What will be the tree structure if the roles of the left and right pointers are swapped at every node, for the tree given below? (1 M)



2. Insert the following values (13, 8, 11, 2) as nodes for the given tree, draw the tree after all insertions and justify your answer for insertion. (2 M)



3. Delete the node 10 from the binary tree given below: (1 M)



BEST OF LUCK

BITS, Pilani – Dubai
Academic City , Dubai
First Semester 2008- 2009

Course Code : TA UC252 | **Course : Computer Programming – II**
Component : Quiz 1 (closed book) | **Marks : 2.5 Duration : 15 mins.**
Date : 14.09.08 | **Class : II year Section : 1**

Answer all questions

Name : **ID NO :**

1. Given the following declarations
```
char *p1;
int  *p2;
```
State whether the following assignments and comparisons are valid or invalid.
a. p2 = 0;
b. p2 = p1;
c. p1 = (char *)p2;
d. if (p2 == 0)

(1 M)

2. Add the missing statement in correct place for the program to print 35
```
#include<stdio.h>
main()
{
  int j, *ptr;
  *ptr = 35;
  printf("%d",j);
}
```
(1M)

3. Structure members and array elements are stored in the same way in memory. True/False

Ans :

(0.5 M)

BITS, Pilani – Dubai
Academic City , Dubai
First Semester 2008- 2009

Course Code : TA UC252 **Course : Computer Programming – II**
Component : Quiz 1 (closed book) **Marks : 2.5 Duration : 15 mins.**
Date : 10.09.09 **Class : II year Section : 2**

Answer all questions

Name : **ID NO :**

---

1. Define a structure data type using bit fields to store the following data about an employee. Each employee can
   a. be male or female
   b. be single, married, divorced or widowed
   c. have one of eight different hobbies
   d. can choose from any of the 15 different schemes proposed by the company to pursue his/her hobby. (1 M)

   Ans:

2. In structures all members can be initialized whereas a union can only be initialized with a value of the type of its _____ member. (0.5 M)

3. Identify the similarity and difference between a structure and a union. (1 M)

   Ans :

Quiz I

Date : 10/9/09 CP-II TAUC 252 Section 6.

1. Create two different structure definitions to store politicians details like name, party, date of winning elections, duration of term. Store the date of winning elections as a separate structure. Store the structure details in two different ways. 1M

2. Create a structure definition for bank account. The details to be stored include acc_no, name of account holder, type of account(can be any one of the following) savings or current. Read in details for one customer. 1.5M

BITS, Pilani – Dubai
Dubai International Academic City, Dubai
I Semester 2008-09
Quiz – 2

Date: _____

Course: TA C252 Computer Programming – II **Section : 3**

To be filled by the Student:

Name: ---------- Id. No.: ----------

Max. Marks: 2.5

---

1. What will be the output of the following program segment?

```
void main()
{
int y=15,z=25;
function(&y,&z);
clrscr();
printf("%d\t%d",z,y);
getch();
}
function (int *p,int *q)
{
return(*p=(*p+*q)-(*q=*p));
}
```

Output:- _____

2. Which of the following is the proper keyword to deallocate memory?

A. free
B. delete
C. clear
D. remove

Ans:- _____

3. Given the following declaration,
char a[ ] = "cba", *p=a;
What is the difference between the values of the expression ++*p and *++p?

a. The first is equal to d, and the second one is equal to b.
b. The first is equal to c, and the second one is equal to a.
c. The first causes a compiler error, while the second does not.
d. The two expressions have the same value.

Ans:- _____

4. Given the structure and pointer declarations shown below, choose the assignment statement which sets the Price member of the structure pointed to by PC to 1000.

```
struct Computer
{
char Manufacturer[30];
float Price;
int Memory;
} *PC;
```

a. PC->Price = 1000.0;
b. PC.Price = 1000.0;
c. *PC.Price = 1000.0;
d. Computer.Price = 1000.0;

Ans:-_____

5. Give the output for the following program segment:

```
main()
{
char *p;
printf(?%d %d ?,sizeof(*p),sizeof(p));
}
```

Output:- _____

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SURPRISE QUIZ: 2

Sub:CPII
Date :23/09/08

Marks:5
Time:15 min

1.Write a program to print the address of a variable along with its value ——2 M

2.State TRUE or FALSE
Poniters need not be essentially declared before using them ——→ 1M

3.What is a Dereferecing Operator ——→ 1M

4.What is a Scale Factor, ——→ 0.5M

write the sacle factor for
1.char
2.float

——→ 0.25×2 = 0.5M.

QUIZ II

COURSE : COMPUTER PROGRAMMING II
COURSE NO : CS C252
Weightage : 2.5% Date : 15/10/08 Section VI

1. Write separate statements using malloc and calloc to allocate space for an array of 15 floating point values. 1M

2. Write a C function to find the largest element in a linked list of size 10. 1.5M

BITS, Pilani – Dubai
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First Semester 2008- 2009

Course Code : TA UC252 | **Course : Computer Programming – II**
Component : Quiz 2 (closed book) | **Marks : 2.5 Duration : 15 mins.**
Date : | **Class : II year Section : 2**

Answer all questions

Name : **ID NO :**

1. On opening a file for reading, which of the following activities are performed?
   a. The disk is searched for the existence of the file.
   b. The file is brought to memory.
   c. A pointer is set up pointing to the first character in the file.
   d. All of the above.

   Ans: (0.5 M)

2. State True / False - It is a must to close all files before terminating a program.

   Ans : (0.5 M)

3. What is the difference between malloc() and calloc() (1 M)
   Ans :

4. The macro FILE is defined in the header file _____. (0.5 M)

BITS, Pilani – Dubai
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First Semester 2008- 2009

Course Code : TA UC252 **Course : Computer Programming – II**
Component : Quiz 2 (closed book) **Marks : 2.5 Duration : 15 mins.**
Date : **Class : II year Section : 1**

Answer all questions

Name : **ID NO :**

1. Using dynamic memory allocation write equivalent instructions in C for the following statement in C: (1 M)

   int a[5] = {1,2,3,4,5};

   Ans :

2. What is the difference between getc() and getchar() (0.5M)
   Ans:

3. _____ and _____ are the two integer-oriented functions used with files in C. (0.5 M)

4. State true / false – Files are always referred to by name in C programs. (0.5 M)

   Ans :-

BITS, Pilani – Dubai
Dubai International Academic City
I Semester 2008 -09

Section: 3 II Year Date:

Quiz- 3

Course: TA C252 Computer Programming - II Marks: 2.5 Marks

Name:_____ Id. No: _____

1. To find the height (h) of a binary tree, there are at least h+1 nodes (T / F)

Justify:-

2. Diagram the tree constructed by *root.Insert( )*.

```
Node root = new Node( 4, null, null, null);
    root.Insert( 3 );
    root.Insert( 1 );
    root.Insert( 2 );
    root.Insert( 6 );
    root.Insert( 5 );
```

3. Construct a tree from the given traversal sequence:

Pre - *15, 6, 2 2, 4, 7, 13, 9, 18, 17, 20*

Post - 2, 4, 3, 9, 13, 7, 6, 17, 20, 18, 15

BITS, Pilani – Dubai
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First Semester 2008- 2009

Course Code : TA UC252 **Course : Computer Programming – II**
Component : Quiz 3 (closed book) **Marks : 2.5 Duration : 15 mins.**
Date : 18. 11. 08 **Class : II year Section : 2**

Answer all questions

Name : **ID NO :**

---

1. How will we get an ordered list from a binary search tree? (0.25 M)

   Ans :- ascending

2. In a binary search tree, the node with the smallest vale is the _____ node in the tree.

   (0.25 M)

3. Draw all possible binary search trees for the three data elements 5, 9 and 12.

   (1 M)

4. Consider the following code :

```
fun1 (int x)
{
  if (x < 5)
      return(3 * x);
else
     return(2 * fun1(x – 5) + 7);
```

}

What would be returned for the function call fun1 (10)?

Ans : (1 M)

BITS, Pilani – Dubai
Academic City , Dubai
First Semester 2008- 2009

Course Code : TA C252 **Course : Computer Programming – II**
Component : Quiz 3 (closed book) **Marks : 2.5 Duration : 15 mins.**
Date : 18. 11. 08 **Class : II year Section : 1**

Answer all questions

Name : **ID NO :**

---

1. For a given binary tree, the following traversals are known:
   a. Inorder and preorder.
   b. Inorder and postorder
   c. Preorder and postorder.

   In which case the tree can be uniquely defined? (0.5 M)

   Ans:

2. All insertions into a binary search tree take place at a _____ (0.5 M)

3. A sort which compares the adjacent elements in a list and switches where necessary is
   a. insertion sort b. exchange sort
   c. quick sort c. bubble sort (0.5 M)

   Ans :

4. An array contains the elements shown below. The first two elements have been sorted using selection sort. What would be the value of the elements in the array after three more passes of the selection sort. (1 M)

   7 8 26 44 13 23 98 57

BITS, Pilani - Dubai
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I– Semester 2008-2009

Number of Pages : 4

Sections : A, B, C, D,E

Course Number	:	**TA C252**
Course Name	:	**Computer Programming - II**
Nature of Component	:	**Comprehensive Examination – Closed book**
Weightage	:	40%
Max. Marks	:	40 Marks
Duration	:	3 Hrs.
Date of Examination	:	**24.12.2008**

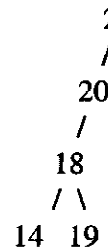
Note: 1) Answer all questions
2) All parts of the question should be answered consecutively. Each answer should start from a fresh page.

SECTION – A

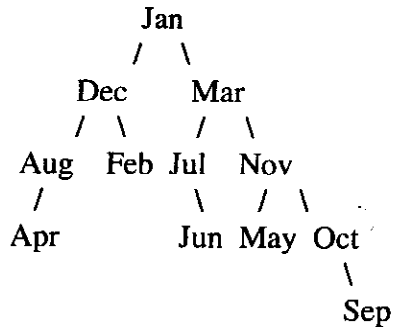
1. An array of student records contain name, roll no, total marks of each student. Write a C program to sort the student records in descending order of total marks. The program should use the following:-
   a. assume total number of students as 'n'
   b. use an array of structures.
   c. Read the details of each student.
   d. Use a suitable sorting algorithm.
   e. Display the sorted records. (3 M)

2. Answer the following with respect to bit fields :-
   a. How bit fields are given values?
   b. Give the syntax of defining bit fields. (0.5 M)

3. The binary search tree in the figure was created starting with a null tree and entering data from the keyboard. In what sequence were the data entered? If there is more than one possible sequence, identify the alternatives. (0.5 M)

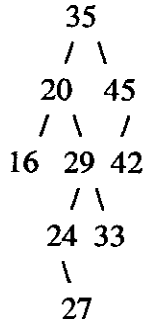


4. Following is a binary search tree with alphabetic data



Identify the traversal which gives an alphabetical ordering of data items. Write the result of the traversal. (1 + 1 M)

5. In the following binary search tree it is required to delete node 20.
   a. How will you identify the node which replaces 20 after deletion?
   b. Draw the tree after deleting 20. (1 + 1 M)



SECTION B

1. What is a stream pointer? What is the relationship between a stream pointer and a buffer area ? (1 M)

2. Summarize the different file-types that can be specified by the fopen function. (1 M)

3. Write a program to read a set of lines from the stdin and to write into the specified file heading using the putc() function. (2M)

4. Without using sizeof operator, write a program to find out size of the following data type. (2 M)
   a) char
   b) int
   c) float
   d) double

5. What will be the output of the following programs? (1 * 2 = 2 M)
   a)

```
#include<stdio.h>

#include<string.h>

void main( )

{

 int register a;

  clrscr( );

  scanf("%d",&a);

 printf("%d ",a);

 getch( );
```

```
}
// if a = 25
```

b)

```
#include<stdio.h>
#include<string.h>
void main()
{
  int a=5,b=10,c;
  int *p=&a,*q=&b;
  c=p-q;
  clrscr();
  printf("%d",c);
  getch();
}
```

SECTION C

1. Consider an empty stack of integers. Let the numbers 1,2,3,4,5,6 be pushed on to this stack only in the order they appeared from left to right. Let S indicates a push and X indicate a pop operation. Can they be permuted in to the order 325641(output)? (if a permutation is possible give the order of string operations.
   (Hint: SSSSSSXXXXXX outputs 654321) (1 M)

2. Draw the queue for each step in the following sequence: add(1), add(2), remove, add(3), add(4), remove, remove, add(5). Assume an initial size of 3 for the array implementation. (1 M)

3. Given a stack S, Write a C program to sort the stack (in the ascending order).
   (Hint : Use array implementation.)
   (2 M)

4. Write a count() function that counts the number of times a given integer occurs in a linked list. The integer has to be passed as an argument to the count() function. (2 M)

5. Write a RemoveDuplicates() function which takes a linked list sorted in increasing order and deletes any duplicate nodes from the list. (2 M)

6. Write any four applications of Linked list. (1 M)

7. With diagram, explain the advantages of Doubly Linked list. (1 M)

SECTION D

1. Write a program to perform merge sort on two arrays A and B of size m and n respectively. The two arrays may be either sorted or unsorted. Write functions to perform the following operations.
   a. Write a function check which takes the size of the array and the array as an argument, checks if the array is sorted , if the array is not sorted it calls a function sort and sends this unsorted array as an argument.
   b. Write a function sort which takes the unsorted array as an argument, sorts this array using selection sort and returns the sorted array.
   c. Write a function merge which merges the two sorted arrays A and B to produce a final sorted array C. (Assume that the sorted array does not have duplicate entries). (4M)

2. Give conditions with examples for when the quicksort sort technique functions
   a. efficiently b. inefficiently. (2M)

3. Given a hash table with 5 locations and a hash function used is H (i) = i% 5, show how this function works if the entries of the hash table are 5,11,18,19,23 in sequence.
   a. Show when does collision occur for the above example?
   b. How is collision resolved in the above example? (2M)

SECTION E

1. Mention the main features of Object Oriented Programming. (2M)

2. Write a program to generate FIBONACCI SERIES using Recursion. (2.5M)

3. What is Top-Down Design? Mention the steps involved to write a program using Top-Down Design. (1.5M)

☺ ☺ ☺ ☺ ☺ ☺ ☺ **BEST OF LUCK** ☺ ☺ ☺ ☺ ☺ ☺ ☺