

AMIETE – ET/CS/IT (Current Scheme)

Time: 3 Hours

December 2016

Max. Marks: 100

PLEASE WRITE YOUR ROLL NO. AT THE SPACE PROVIDED ON EACH PAGE IMMEDIATELY AFTER RECEIVING THE QUESTION PAPER.

NOTE: There are 9 Questions in all.

- Question 1 is compulsory and carries 20 marks. Answer to Q.1 must be written in the space provided for it in the answer book supplied and nowhere else.
- The answer sheet for the Q.1 will be collected by the invigilator after 45 minutes of the commencement of the examination.
- Out of the remaining EIGHT Questions answer any FIVE Questions, selecting at least TWO questions from each part, each question carries 16 marks.
- Any required data not explicitly given, may be suitably assumed and stated.

Q.1 Choose the correct or the best alternative in the following: (2×10)

a. What is the output of the given expression $5 + 3 * 2 \% 10 - 8 * 6$

- (A) -42 (B) -37
(C) -28 (D) -32

b. Predict the output or error(s) for the following:

```
void main(){int i = -1,j = -1,k = 0,l =2,m ;
m=i++&&j++&&k++||l++;
printf("%d %d %d %d %d",i,j,k,l,m);}
```

- (A) 00131 (B) -1-1012
(C) 00121 (D) Compiler Error

c. Which keyword is used to come out of a loop only for that iteration?

- (A) Break (B) Continue
(C) Return (D) None of these

d. What is the output of the following program?

```
#include<stdio.h>
int main(){int a[] = {0,1,2,3,4,5,6,7,8,9,10};
int i = 0, num;
num = a[++i + a[++i]] + a[++i];
printf("%d",num);
return 0;}
```

- (A) 6 (B) 7
(C) 8 (D) 9

e. What is the output of the following code?

```
main(){
char *str1="abcd";
char str2[]="abcd";
printf("%d %d %d",sizeof(str1),sizeof(str2),sizeof("abcd"));
```

- (A) 254 (B) 253
(C) 255 (D) None of these

- f. In tree construction which is the suitable efficient data structure?
 (A) Array (B) Linked List
 (C) Stack (D) Queue
- g. What is the output of the following program?

```
void main(){char string[]="Hello World";display(string);}
void display(char *string){printf("%s",string);}
```

 (A) Hello World (B) hello world
 (C) No string is displayed (D) Compiler Error
- h. The three standard files which can be accessed by any program in C language are
 (A) Standard error file, Standard output file, Standard input file
 (B) stdin, stderr, stdout
 (C) Keyword, stderr, screen
 (D) All of these
- i. Sorting is not possible using which of the following methods
 (A) Insertion (B) Selection
 (C) Exchange (D) Deletion
- j. If k is the depth of a tree then the maximum number nodes that the tree could have is
 (A) $2^k - 1$ (B) 2^k
 (C) $2^k + 1$ (D) None of these

PART (A)

Answer at least TWO Questions from this part. Each question carries 16 marks.

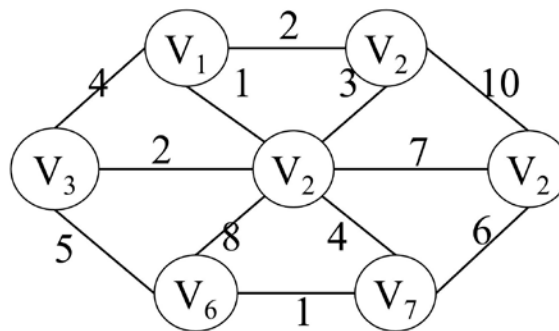
- Q.2** a. Write short notes on the following giving suitable examples (3×4)
 (i) Switch statement
 (ii) Comma operator
 (iii) Type casting
 (iv) short circuit operators
- b. Write a C program to swap two numbers without using a third variable. (4)
- Q.3** a. Using for loop write a program to calculate the simple interest for three different sets of p,n,r (6)
- b. Two numbers are given as input. Write a program to find the value of first number raised to the power of second number. (4)
- c. Write a program to print out all Armstrong numbers between 1 and 500. If sum of cubes of each digit of the number is equal to the number itself, then the number is called an Armstrong number. (6)
 For example, $153 = (1 * 1 * 1) + (5 * 5 * 5) + (3 * 3 * 3)$

- Q.4** a. Write a c program to perform matrix multiplication. (12)
 b. Write a program to pass by reference. (4)
- Q.5** a. What do you mean by null terminator? Explain with the help of example and also write a program to calculate the number of characters in a string. (8)
 b. Write a c program to store the details of employee in a file. (8)

PART (B)

Answer at least TWO Questions from this part. Each question carries 16 marks.

- Q.6** a. Write a c program to find the saddle point of a matrix (12)
 b. Using Bubble sort algorithm sort the given set of numbers. Provide the trace of each step. 34, 8, 64, 51, 32, 21 (4)
- Q.7** Write a c program to implement the conversion of infix expression to postfix notation using stack. (16)
- Q.8** a. Explain Binary Search Tree with suitable diagrams (4)
 b. Write a c language function to create a binary search tree (12)
- Q.9** a. For the given graph, using Prim's algorithm, find out the minimum spanning Tree. Provide the steps involved in forming the minimal spanning tree. (12)



- b. A set of five courses C1, C2, C3, C4, C5 a part-time student has to take in some degree program. The courses can be taken in any order as long as the following prerequisites are satisfied: C1 and C2 have no prerequisites, C3 requires C1 and C2, C4 requires C3 and C5 requires C3 and C4 course per term. In which order should the student take the course? Represent the situation pictorially using suitable data structure. What operation has to be performed to order the courses a student will take? (4)