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First Semester Regular /Back Examination – 2015-16
PROGRAMMING IN C
BRANCH-MCA
Time: 3 Hours,Q.CODE-T800

Max marks: 70
Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.

Q1   Answer the following questions: (2 x 10)

a) What is the use of a cache memory? How many types of caches are there?

b) What will be output if you will compile and execute the following c code? Justify your answer.
```
void main(){
  int i=320;
  char *ptr=(char *)&i;
  printf("%d",*ptr);
}
```

c) What is the sum of 00110011 and 10101111? Answer in binary.

d) Consider the following pseudo code. What is the total number of multiplications to be performed?
```
D = 2
for i = 1 to n do
  for j = i to n do
    for k = j + 1 to n do
      D = D * 3
```

e) What will be the output of the program?
```
#include<stdio.h>
#include<string.h>
int main()
{
  static char s[] = "Hello!";
  printf("%d\n", *(s+strlen(s)));
  return 0;
}
```

f) Point out the error in the program?
```
#include<stdio.h>
/* Assume there is a file called 'file.c' in c:\tc directory. */
int main()
{
  FILE *fp;
  fp=fopen("c:\tc\file.c", "r");
  if(!fp)
    printf("Unable to open file.");
  fclose(fp);
  return 0;
}
```

g) What is the output of the following program? (The output may include a compilation error).
```c
#include <stdio.h>
void main
{
  int a[]={1, 2,3,4,5,61;
  int *ptr = a+2;
  printf ("%d', *--ptr) ;
}
```

h) What will be the output of the program?
```c
#include<stdio.h>
int func1(int);
int main()
{
  int k=35;
  k = func1(k=func1(k=func1(k)));
  printf("k=%d\n", k);
  return 0;
}
int func1(int k)
{
  k++;
  return k;
}
```

i) What will be the output of the program (myprog.c) given below if it is executed from the command line?
cmd> myprog 10 20 30
```c
/* myprog.c */
#include<stdio.h>
int main(int argc, char **argv)
{
  int i;
  for(i=0; i<argc; i++)
    printf("%s\n", argv[i]);
  return 0;
}
```

j) What is the output of the following program? (The output may include a compilation error).
```c
int main()
{
  struct byte
  {
    int one:1;
  };
  struct byte var = {1};
  printf("%d\n", var.one);
  return 0;
}
```

Q3 a) Write a program to input a whole number n from command line and display the square of first n odd numbers.   (5)

b) Write a program to create a structure data type called TIME containing three   (10)

integer members: hour, minute and second. Develop a program that would assign values to the individual members and display the time in the format hh:mm:ss. Also define a user defined function Add that would add two times. Use this function within the main function.

Q4 a) Explain the various branch structures available in C.   (5)
    b) Without using any loop structures (while, do while, or for), write a program to print   (5)
        all odd numbers between 100 and 500 in decreasing order.
    c) Write a program that takes as input a string and two numbers n1 and n2 and find   (5)
        the substring between these two positions. For example, let the string is "Welcome"
        and the numbers are n1=2 and n2=5 then the substring will be: "lcom".

Q5 a) Explain the possible storage classes of a variable with suitable examples.   (8)
    b) A file NUM contains an array of 100 integers. Write a program that will read these   (7)
        numbers, sort them and then store the sorted list in another file SORTED. Use
        command line arguments to specify the file names.

Q6 a) Explain the call by value and call by reference with suitable examples.   (5)
    b) Using pointers, write a function that receives a character string and a character as   (5)
        arguments and deletes all occurrence of this character in the string. The function
        should return the corrected string with no holes.
    c) What do you understand by pointer to a pointer? Can this be extended to any   (5)
        level? Explain.

Q7 a) What is dynamic memory management? What are its advantages? Explain the   (5)
        different memory management functions in C. Discuss each with suitable
        examples.
    b) Write a C function which takes basic salary of an employee as input and calculates   (5)
        his TA, DA, HRA and GROSS salary as follows :
        TA = 10% of basic
        DA = 25% of basic
        HRA = 45% of basic
        GROSS salary includes basic salary and all allowances.
        Using the above function write a program that accepts the basic salary, calculates
        the allowances and displays the gross salary.
    c) Write a function using pointers to add two matrices and return the resultant matrix.   (5)
        Use this function within the main function to add two matrices.

Q8   Write short notes on any three   (5 x 3)
    a) ASCII Vs. EBCDIC codes.
    b) Unformatted console I/O functions.
    c) Structures Vs. Unions
    d) Self referential Structure