DipIETE – ET/CS (NEW SCHEME) - Code: DE53/DC53

Subject: COMPUTER FUNDAMENTALS & C PROGRAMMING

Time: 3 Hours   **DECEMBER 2010**   Max. Marks: 100

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 half an hour of the commencement of the examination.**
- **Out of the remaining EIGHT Questions answer any FIVE Questions, selecting TWO questions from part A and THREE questions from part B. 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. Operating system

   (A) Link a program with the subroutines it references
   (B) Provides a layered, user-friendly interface
   (C) Enables a programmer to draw a flowchart
   (D) None of the above

b. Execution of two or more programs by a single CPU is known as

   (A) Multiprocessing   **(B)** Time sharing
   (C) Multiprogramming   **(D)** None of the above

c. How do printf()'s format specifiers %e and %f differ in their treatment of floating-point numbers?

   (A) %e displays an argument of type double with trailing zeros; %f never displays trailing zeros.
   (B) %e displays a double in engineering notation if the number is very small or very large.
   (C) %e expects a corresponding argument of type double; %f expects a corresponding argument of type double.
   (D) %e expects a corresponding argument of type float; %f expects a corresponding argument of type float.

d. A translator is best described as

   (A) An Application software   **(B)** A system software
   (C) A hardware component   **(D)** none of the above

e. What is the difference between a declaration and a definition of a variable?

   (A) Both can occur multiple times, but a declaration must occur first.
   (B) There is no difference between them.
   (C) A declaration occurs once, but a definition may occur many times.
   (D) Both can occur multiple times, but a definition must occur first.

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f. #define MAX_NUM 15;
   Referring to the sample above, what is MAX_NUM?

   (A) MAX_NUM is an integer variable.
   (B) MAX_NUM is a linker constant.
   (C) MAX_NU is a precompiler constant.
   (D) MAX_NUM is a preprocessor macro.

g. Pick out the wrong definition

   (A) Access time – time needed to access the output
   (B) EDP- acronym for Electronic Data Processing
   (C) COBOL – a language used for business data processing
   (D) Control unit – heart of a computer

h. Array is collection of

   (A) Declared data   **(B)** Undeclared data
   (C) Homogeneous data   **(D)** Heterogeneous data

i. 2's complement of –8 is

   (A) 0111   **(B)** 101000
   (C) 01000   **(D)** 1000

j. What function will read a specified number of elements from a file?

   (A) fileread()   **(B)** getline()
   (C) readfile()   **(D)** fread()

PART A
Answer any TWO questions. Each question carries 16 marks.

Q.2   a.   Draw the block diagram of a computer and briefly explain role of each part.**(6)**

      b.   Write a note on "Error Detection and Correction".   **(6)**

      c.   Convert the following numbers into decimal numbers:-
         (i) $(10000111)_2$
         (ii) $(23AD)_{16}$ **(4)**

Q.3   a.   Differentiate between the low level languages and high level languages.   **(4)**

      b.   Explain the memory organization. Which memory is the fastest?   **(6)**

      c.   List various functions of an operating system? How does an Operating System
         perform process management? Explain.   **(6)**

Q.4 a. Explain the four classes of interrupts in detail.

b. Write a short note on the internal bus architecture of a microprocessor. Explain the three types of buses. **(6)**

c. Write a note on Internet and Intranet. **(4)**

PART B
Answer any THREE questions. Each question carries 16 marks.

Q.5 a. It is said that 'C' is a middle level assembly language. Mention those features of 'C' which justify this description. **(4)**

b. What is an execution error? Differentiate it from syntactic error. Give examples. **(4)**

c. Write short notes, with examples, on

(i) Syntax of printf()
(ii) Precedence of arithmetic operators. **(8)**

Q.6 a. Differentiate between **if-then-else** and a **switch** statement by giving a suitable example. **(6)**

b. Identify all the compound statements which appear in the following program segment: **(2)**

```
{
sum=0;
do  {
scanf("%d", &i);
if  (i < 0)
{
i=-i;
++flag;
}
sum  += i;
} while  (i != 0);
}
```

c. Develop a program to calculate sum of n even integers starting from a given even integer. **(8)**

Q.7 a. How are arrays processed in 'C'? Illustrate by taking two-dimensional arrays as examples. **(6)**

b. What are subscripts? How are they specified? What restrictions apply to the values that can be assigned to subscripts in 'C' language? **(4)**

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c. Write a 'C' program that will enter a line of text, store in an array and display backwards. The length of the line should be undefined, (be terminated by ENTER key), but less than 80 characters. **(6)**

Q.8 a. Draw a flowchart and then develop an interactive 'C' program which finds whether a given integer number is prime or not. Make use of a function subprogram. **(6)**

b. Differentiate between a function call and a function prototype. **(4)**

c. What is the return type of main()? **(2)**

d. Give a subroutine on calculation of a factorial of a given number. **(4)**

Q.9 a. What is a pointer in 'C'? How is a pointer variable declared? Give examples and explain. Enumerate the utility of pointer variables. **(5)**

b. A program in 'C' language contains the following declaration:

static int x[8] = {1,2,3,4,5,6,7,8};

(i)   What is the meaning of x?
(ii)   What is the meaning of $(x + 2)$?
(iii)   What is the meaning of *x?
(iv)   What is the meaning of $(*x + 2)$?
(v)   What is the meaning of $*(x + 2)$? **(5)**

c. Explain the following functions and give the proper syntax.
getw(), putw(), getc(), putc() **(6)**