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ICSE 2011 : COMPUTER APPLICATIONS

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COMPUTER APPLICATIONS

(Theory)

(Two hours)

Answers to this Paper must be written on the paper provided separately.

You will **not** be allowed to write during the first 15 minutes.

This time is to be spent in reading the question paper.

The time given at the head of this Paper is the time allowed for writing the answers.

This paper is divided into two Sections.

Attempt **all** questions from Section A and **any four** questions from Section B.

The intended marks for questions or parts of questions are given in brackets [].

SECTION - A (40 MARKS)

(Attempt all questions)

Question 1.

- (a) What is the difference between an object and a class ? [2]
- (b) What does the token 'keyword' refer to, in the context of Java ? Give an example for keyword. [2]
- (c) State the difference between *entry* controlled loop and *exit* controlled loop. [2]
- (d) What are the two ways of invoking functions ? [2]
- (e) What is the difference between / and % operator ? [2]

Question 2.

- (a) State the total size in bytes, of the arrays a[4] of *char* data type and p[4] of *float* data type. [2]
- (b) (i) Name the package that contains Scanner class.
(ii) Which unit of the class gets called, when the object of the class is created ? [2]
- (c) Give the output of the following :
String n = "Computer Knowledge";
String m = "Computer Applications";
System.out.println(n.substring(0,8).concat(m.substring(9)));
System.out.println(n.endsWith("e")); [2]
- (d) Write the output of the following :
(i) System.out.println(Character.isUpperCase('R'));
(ii) System.out.println(Character.toUpperCase('j')); [2]
- (e) What is the role of keyword *void* in declaring functions ? [2]

Question 3.

- (a) Analyse the following program segment and determine how many times the loop will be executed and what will be the output of the program segment ?
int p = 200;
while(true)

```

{
    if(p<100)
        break;
    p=p - 20;
}
System.out.println(p);

```

(b) What will be the output of the following code ?

```

(i) int k=5, j=9;
    k+=k++ - ++j + k;
    System.out.println("k="+k);
    System.out.println("j="+j);

```

```

(ii) double b = -15.6;
    double a = Math rint(Math.abs(b));
    System.out.println("a="+a);

```

(c) Explain the concept of constructor overloading with an example. [2]

(d) Give the prototype of a function *search* which receives a sentence *sentnc* and a word *wrd* and returns 1 or 0 ? [2]

(e) Write an expression in Java for $z = \frac{5x^3 + 2y}{x + y}$ [2]

(f) Write a statement each to perform the following task on a string :

```

(i) Find and display the position of the last space in a string s.
(ii) Convert a number stored in a string variable x to double data type.

```

(g) Name the keyword that

```

(i) informs that an error has occurred in an input/output operation.
(ii) distinguishes between instance variables and class variables.

```

(h) What are library classes ? Give an example. [2]

(i) Write one difference between Linear Search and Binary Search. [2]

SECTION - B (60 MARKS)

Attempt any four questions from this Section.

The answers in this Section should consist of the Programs in either Blue J environment or any program environment with Java as the base.

Each program should be written using Variable descriptions/Mnemonic Codes such that the logic of the program is clearly depicted.

Flow-Charts and Algorithms are not required.

Question 4.

Define a class called *mobike* with the following description :

Instance variables / data members :

int bno	-	to store the bike's number
int phno	-	to store the phone number of the customer
String name	-	to store the name of the customer
int days	-	to store the number of days the bike is taken on rent

int charge - to calculate and store the rental charge

Member methods :

void input() - to input and store the detail of the customer

void compute() - to compute the rental charge.

The rent for a mobike is charged on the following basis :

First five days ₹ 500 per day.

Next five days ₹ 400 per day.

Rest of the days ₹ 200 per day.

void display() - to display the details in the following format :

Bike No.	Phone No.	Name	No. of days	Charge
_____	_____	_____	_____	_____

[15]

Question 5.

Write a program to input and store the weight of ten people. Sort and display them in descending order using the selection sort technique. [15]

Question 6.

Write a program to input a number and print whether the number is a special number or not. (A number is said to be a special number, if the sum of the factorial of the digits of the number is same as the original number).

Example : 145 is a special number, because $1!+4!+5! = 1+24+120=145$

(Where ! stands for factorial of the number and the factorial value of a number is the product of all integers from 1 to that number, example $5! = 1*2*3*4*5=120$). [15]

Question 7.

Write a program to accept a word and convert it into lowercase if it is in uppercase, and display the new word by replacing only the vowels with the character following it.

Example :

Sample Input : computer

Sample Output : cpmptvfr

[15]

Question 8.

Design a class to overload a function compare() as follows :

(a) void compare(int, int) - to compare two integer values and print the greater of the two integers.

(b) void compare(char, char) - to compare the numeric value of two characters and print the character with higher numeric value.

(c) void compare(String, String) - to compare the length of the two strings and print the longer of the two. [15]

Question 9.

Write a menu driven program to perform the following : (Use switch - case statement)

(a) To print the series 0, 3, 8, 15, 24 n terms (value of 'n' is to be an input by the user.)

(b) To find the sum of the series given below :

$$S = 1/2 + 3/4 + 5/6 + 7/8 + \dots + 19/20.$$

[15]