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ICSE 2025 EXAMINATION
SPECIMEN QUESTION PAPER
COMPUTER APPLICATIONS

SOLUTION

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*This Paper is divided into **two** Sections.*

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

SECTION A

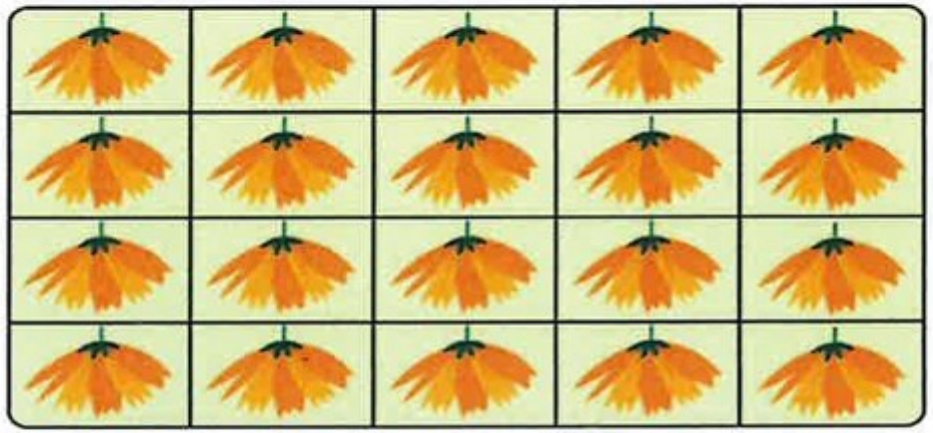
*(Attempt **all** questions from this **Section**.)*

Question 1 [20]

Choose the correct answers to the questions from the given options.

(Do not copy the question, write the correct answers only.)

(i)



Name the above structure:

(a) One dimensional array

(b) Two Dimensional array with 4 rows and 5 columns

(c) Three dimensional array

(d) Two Dimensional array with 5 rows and 4 columns **[Analysis]**

Answer. (b) Two Dimensional array with 4 rows and 5 columns

(Reason – The 2-D array only comes in row x column format)

(ii) "Java compiled code (byte code) can run on all operating systems"
– Name the feature.

(a) Robust and Secure

(b) Object Oriented

(c) Platform Independent

(d) Multithreaded **[Understanding]**

Answer. (c) Platform Independent

(Reason – Byte code form is platform independent and can be run on any machine irrespective of its platform configuration.)

(iii) The size of '\n ' is:

(a) 2 bytes

(b) 4 bytes

(c) 8 bytes

(d) 16 bytes **[Recall]**

Answer. (a) 2 bytes

(Reason – '\n' is an escape sequence which is character type in nature and in Java character datatype requires 2 bytes of memory allocation.)

(iv) Identify the operator that gets the highest precedence while evaluating the given expression:

$$a + b \% c * d - e$$

(a) +

(b) %

(c) –

(d) * **[Analysis]**

Answer. (b) %

(Reason – *** (multiply) / (divide) % (modulus) -** all three operators have higher precedence over + and -, but they also have the same precedence among each other. Now operators with the same precedence work according to the associativity rule which states that the operator appearing first will be processed first.)

(v) Which of the following is a valid java keyword?

(a) If

(b) BOOLEAN

(c) static

(d) Switch

[Understanding]

Answer. (c) static

(Reason – all others are not keywords as they have mixed case or UPPER case of letters)

(vi) The output of the following code is:

```
System.out.println(Math.ceil(6.4)+Math.floor(-1-2));
```

(a) 3.0

(b) 4

(c) 3

(d) 4.0 **[Analysis]**

Answer. (d) 4.0

Working:

Math.ceil(6.4) = 7.0

Math.floor(-1-2) = -3.0

7.0 – 3.0 = 4.0

(vii) Which of the following returns a String?

(a) length()

(b) charAt(int)

(c) replace(char, char)

(d) indexOf(String) **[Understanding]**

Answer. (c) replace(char, char)

(viii) Which of the following is not true with regards to a switch statement?

(a) checks for an equality between the input and the case labels

(b) supports floating point constants

(c) break is used to exit from the switch block

(d) case labels are unique **[Understanding]**

Answer. (b) supports floating-point constants

(Reason – switch case works on only integer and character data type i.e byte, short, int, long and char

(ix) Consider the array given below:

```
char ch[]={ 'A','E','I','O', 'U'};
```

Write the output of the following statements:

```
System.out.println(ch[0]*2);:
```

(a) 65

(b) 130

(c) 'A'

(d) 0

[Analysis]

Answer. (b) 130

(Reason – ch[0] = 'A', now ASCII value of 'A' = 65, so 65*2 = 130)

(x) To execute a loop 10 times, which of the following is correct?

(a) for (int i=11;i<=30;i+=2)

(b) for (int i=11;i<=30;i+=3)

(c) for (int i=11;i<20;i++)

(d) for (int i=11;i<=21;i++)

[Analysis]

Answer. (a) for(int i=11; i<=30; i+=2)

(Reason – i=11, 13, 15, 17, 19, 21, 23, 25, 27, 29 i.e. 10 counts)

(xi) A single dimensional array has 50 elements, which of the following is the correct statement to initialize the last element to 100.

(a) x[51]=100

(b) x[48]=100

(c) x[49]=100

(d) x[50]=100

[Analysis]

Answer. (c) x[49]=100

(Reason- last index of the array x[] is 49)

(xii) Method prototype for the method compute which accepts two integer arguments and returns true/false.

(a) void compute (int a, int b)

(b) boolean compute (int a, int b)

(c) Boolean compute (int a,b)

(d) int compute (int a, int b) **[Understanding]**

Answer. (b) boolean compute(int a, int b)

(xiii) The statement that brings the control back to the calling method is:

(a) break

(b) System.exit(0)

(c) continue

(d) return **[Recall]**

Answer. (d) return
(Reason – return statement exits the **called** function and returns the control back to the **caller** function.)

(xiv) The default value of a boolean variable is:

(a) False

(b) 0

(c) false

(d) True

[Recall]

Answer. (c) false

(xv) The method to convert a lowercase character to uppercase is:

(a) String.toUpperCase( )

(b) Character.isUppercase (char)

(c) Character.toUpperCase(char)

(d) toUpperCase ( )

[Recall]

Answer. (c) Character.toUpperCase(char)

(xvi) **Assertion (A):** Integer class can be used in the program without calling a package.

Reason (R): It belongs to the default package java.lang.

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)

(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion(A)

(c) Assertion (A) is true and Reason (R) is false

(d) Assertion (A) is false and Reason (R) is true **[Application]**

Answer. (a) Both Assertion and Reason are true and Reason is a correct explanation of Assertion

(Reason- java.lang is the only package automatically added to every class created by a programmer. Integer class is a part of this package.)

(xvii) A student executes the following code to increase the value of a variable 'x' by 2.

He has written the following statement, which is incorrect.

$x = +2;$

What will be the correct statement?

A. $x +=2;$

B. $x =2;$

C. $x = x +2;$

(a) Only A

(b) Only C

(c) All the three

(d) Both A and C

[Analysis]

Answer. (d) Both A and C

(Reason : x+=2 means x=x+2)

(xviii) The statement used to find the total number of Strings present in the string array String s[] is:

(a) s.length

(b) s.length()

(c) length(s)

(d) len(s) **[Analysis]**

Answer. (a) s.length

(xix) Consider the following program segment in which the statements are jumbled, choose the correct order of statements to swap two variables using the third variable.

```
void swap(int a, int b)
{   a = b;      → (1)
    b = t;      → (2)
    int t = 0;  → (3)
    t = a;      → (4)
}
```

(a) (1) (2) (3) (4)

(b) (3) (4) (1) (2)

(c) (1) (3) (4) (2)

(d) (2) (1) (4) (3)

[Analysis]

Answer. (b) (3) (4) (1) (2)

(Reason : Swapping by 3rd variable i.e.

```
int t = 0;
t = a;
a = b;
b = t;      )
```

(xx) **Assertion(A):** An argument is a value that is passed to a method when it is called.

Reason(R): Variables which are declared in a method prototype to receive values are called actual parameters

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)

(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion(A)

(c) Assertion (A) is true and Reason (R) is false

(d) Assertion (A) is false and Reason (R) is true **[Application]**

Answer. (c) Assertion is true and Reason is false

(Reason- actual parameters are the values or variables passed in the function call statement whereas the variable declared in the function definition are called formal parameters those who receive the value from the called functions)

Question 2

(i) Rewrite the following code using single if statement. [2]

```
if (code== 'g ')
System.out.println ("GREEN ");
else if (code== 'G ')
System.out.println ("GREEN ");
```

[Understanding]

(ii) Evaluate the given expression when the value of a=2 and b=3 [2]

```
b*=a++ - ++b + ++a;
System.out.println ("a= "+a);
System.out.println ("b= "+b);
```

[Analysis]

Answer.

(i) if(code ==‘g’ || code==‘G’)
System.out.println(“GREEN”);

(ii) a=4
b=6

Working: b = b*(a++ - ++b + ++a)
= 3 * (2 – 4 + 4)
=3*2 = 6
a= 4

(iii) A student executes the following program segment and gets an error. Identify the statement which has an error, correct the same to get the output as WIN. [2]

```
boolean x = true;
switch(x)
{     case 1: System.out.println ("WIN"); break;
      case 2: System.out.println ("LOOSE");
}
```

[Analysis]

boolean x=true; //Statement with error

Correct code:

```
int x=1;
switch(x)
{…}
```

Reason: boolean data type cannot work on switch

(iv) Write the Java expression for $\sqrt[3]{x} + \sqrt{y}$ [2]

[Understanding]

Answer.

```
double z = Math.cbrt(x) + Math.sqrt(y);
```

(v) How many times will the following loop execute? Write the output of the code: [2]

```
int x=10;
while (true) {
System.out.println (x++ * 2);
if (x%3==0)
break;
}
```

[Analysis]

Answer.

The loop will run TWO times.
Output:
20
22

X	Print X*2	X++	X%3==0	break
10	20	11	false	
11	22	12	true	Loop ends

(vi) Write the output of the following String methods: [2]

```
String x= "Galaxy ", y= "Games ";
```

(a) `System.out.println (x.charAt(0)==y.charAt(0));`

(b) `System.out.println (x.compareTo(y));` **[Analysis]**

(vii) Predict the output of the following code snippet: [2]

```
char ch='B';
char chr= Character.toLowerCase(ch);
int n=(int) chr-10;
System.out.println((char)n+"\t"+chr);
```

Answer.

(vi) (a) true
(b) -1

ASCII('l') – ASCII('m') = -1

(vii) X b

ASCII('b') = 98
98-10 = 88
ASCII 90 = 'Z'
ASCII 88 = 'X'

(viii) A student is trying to convert the string present in x to a numerical value, so that he can find the square root of the converted value, However the code has an error. Name the error (syntax / logical / runtime). Correct the code so that it compiles and runs correctly. [2]

```
String x= "25";

int y=Double.parseDouble (x);

double r=Math.sqrt (y);

System.out.println (r);
```

[Analysis]

Answer. Syntax error
Correct code -

```
double y = Double.parseDouble(x);
```

(ix) Consider the following program segment and answer the questions [2]

below:

```
class calculate
{
    int a; double b;
    calculate()
    {
        a=0;

        b=0.0;
    }
    calculate(int x, double y)
    {
        a=x;

        b=y;
    }
    void sum()
    {
        System.out.println(a*b);
    }
}
```

[Analysis]

Name the type of constructors used in the above program segment?

Answer.

calculate( ) – is the default constructor

calculate(int x, double y) – is the parameterised constructor

(x) Consider the following program segment and answer the questions given below: [2]

```
int x[ ] [ ] = { {2,4,5,6}. {5,7,8,1}, {34, 1,10, 9}};
```

(a) What is the position of 34?

(b) What is the result of x[2][3] + x[1][2]?

[Analysis]

Answer.

(a) x[2][0]

(b) 17 (9+8)

	0	1	2	3
0	2	4	5	6
1	5	7	8	1
2	34	1	10	9

SECTION B

*(Attempt **any four** questions from this **Section**.)*

Question 3 [15]

Define a class with the following specifications:

Class name: Bank

Member variables:

double p – stores the principal amount

double n – stores the time period in years

double r – stores the rate of interest

double a – stores the amount

member methods:

void accept () – input values for p and n using Scanner class methods only.

void calculate () – calculate the amount based on the following conditions:

Time in (Years)	Rate %
Upto ½	9
> ½ to 1 year	10
> 1 to 3 years	11
> 3 years	12

$$a = p\left(1 + \frac{r}{100}\right)^n$$

void display () – display the details in the given format.

Principal	Time	Rate	Amount
xxx	xxx	xxx	xxx

[Understanding / Application]

Write the main method to create an object and call the above methods.

```
import java.util.*;
class Bank
{
    double p,n,r,a;//data members

    public void accept()
    {
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter the principal and time");
        p=sc.nextDouble();
        n=sc.nextDouble();
    }
    public void calculate()
    {
        if(n<0.5)
        r=9;
        else if(n<=1)
        r=10;
        else if(n<=3)
        r=11;
        else
        r=12;
        a=p*Math.pow(1+r/100.0,n);//computing the amount
    }
```

```
    public void display()
    {
        System.out.println("Principle\tTime\tRate\tAmount");
        System.out.println(p+"\t"+n+"\t"+r+"\t"+a);
    }

    public static void main(String ar[])
    {
        Bank ob=new Bank();//creating an object
        ob.accept();
        ob.calculate();
        ob.display();
    }
}
```

Variable	Data type	Description
p	double	To store Principal amount
n	double	To store Time period
r	double	To store Rate of interest
a	double	To store Final amount
sc	Scanner	Object to call input method
ob	Bank	Object of Bank class

BlueJ: Terminal Window - SampleQP2025

Options

```
Enter the principal and time
20000
3
Principle       Time    Rate    Amount
20000.0         3.0     11.0    27352.620000000006
```

Question 4 [15]

Define a class to search for a value input by the user from the list of values given below. If it is found display the message "Search successful", otherwise display the message "Search element not found" using Binary search technique.

[Understanding / Application]

5.6, 11.5, 20.8, 35.4, 43.1, 52.4, 66.6, 78.9, 80.0, 95.5.

```java
import java.util.Scanner;
class Binary
{
    public static void main()
    {
        Scanner sc=new Scanner(System.in);
        double x[]={5.6,11.5,20.8,35.4,43.1,52.4,66.6,78.9,80.0,95.5};
        System.out.print("Enter a no. to search:");
        double n=sc.nextDouble();
        int lb=0,ub=x.length-1;//setting the lowerbound index and upperbound index
        while(lb<=ub)
        {
            int mid=(lb+ub)/2;//findig the mid position
            if(x[mid]==n)
            {
                System.out.println("Search successful");
                break;
            }
            else if(x[mid]<n)//mid element smaller than search element
                lb=mid+1; //shifting lower bound after mid value
            else
                ub=mid-1; //shifting upper bound before mid value
        }
        if(lb>ub) //entire array got searched
            System.out.println("Search element not found");
    }
}
```

Question 5 [15]

Define a class to accept a string and convert the same to uppercase, create and display the new string by replacing each vowel by immediate next character and every consonant by the previous character. The other characters remain the same.

Example: Input : #IMAGINATION@2024

Output : #JLBFJMBSJPM@2024

[Understanding / Application]

```java
import java.util.Scanner;
class Convert
{
    public static void main()
    {
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter the string");
        String str=sc.next().toUpperCase();
        String res="";
        int len=str.length();
        for(int i=0;i<len;i++)
        {
            char ch=str.charAt(i);
            if(Character.isLetter(ch))//checking for alphabet
            {
                if(ch=='A'||ch=='E'||ch=='I'||ch=='O'||ch=='U')
                ch++;//vowel replaced by immediate next character
                else
                ch--;//consonent replaced by previous character
            }
            res+=ch;
        }
        System.out.println(res);
    }
}
```

Question 6 [15]

Define a class to accept values into 4x4 array and find and display the sum of each row.

Example:

A[][]={1,2,3,4},{5,6,7,8},{1,3,5,7},{2,5,3,1}}

Output:

sum of row 1 =10 (1+2+3+4)

sum of row 2= 26 (5+6+7+8)

sum of row 3=16 (1+3+5+7)

sum of row 4= 11 (2+5+3+1)

[Understanding / Application]

```java
import java.util.Scanner;
class SumRow
{
    public static void main()
    {
        Scanner sc=new Scanner(System.in);
        int arr[][]=new int[4][4];
        System.out.println("Enter the elements");
        for(int i=0;i<4;i++)//rows
        {
            for(int j=0;j<4;j++)//columns
            {
                arr[i][j]=sc.nextInt();
            }
        }
        int Rsum=0;
        for(int i=0;i<4;i++)//loop for row
        {
            for(int j=0;j<4;j++)//loop for column
            {
                Rsum+=arr[i][j]; //adding elements in each row
            }
            System.out.println("Sum of row "+i+"="+Rsum);
            Rsum=0;//resetting to 0
        }
    }
}
```

Question 7

Define a class to accept a number and check whether it is a SUPERSPY number or not. A number is called SUPERSPY if the sum of the digits equals the number of the digits. [15]

Example1:

Input: 1021

output: SUPERSPY number [SUM OF THE DIGITS = 1+0+2+1 = 4,
NUMBER OF DIGITS = 4]

Example2:

Input: 125

output: Not an SUPERSPY number [1+2+5 is not equal to 3]

[Understanding / Application]

```java
import java.util.Scanner;
class SuperSpy
{
    public static void main()
    {
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter the number");
        int n=Math.abs(sc.nextInt());
        int sum=0, count=0;
        int dup=n; //duplicate value of n
        while(dup>0)//loop for extracting digits
        {
            count++; //counting the digits
            sum+=dup%10; //adding the digits to sum
            dup/=10; //remaining number
        }
        if(sum==count)
        System.out.println("SUPERSPY number");
        else
        System.out.println("Not an SUPERSPY number");
    }
}
```

Question 8 [15]

Define a class to overload the method display() as follows:

void display(): To print the following format using nested loop.

1 2 1 2 1

1 2 1 2 1

1 2 1 2 1

void display (int n, int m) : To print the quotient of the division of m and n if m is greater than n otherwise print the sum of twice n and thrice m.

double display (double a, double b, double c) – to print the value of z where

$z = p \times q$

$p = \frac{a+b}{c}$ $q = a + b + c$

[Understanding / Application]

```
class Overload
{
    public void display()
    {   for(int r=1;r<=3;r++)
        {
            for(int c=1;c<=5;c++)
            {   if(c%2==0)
                    System.out.print(2);
                else
                    System.out.print(1);
            }
            System.out.println();
        }
    }
    public void display(int m, int n)
    {   if(m>n)
            System.out.println(m/n);
        else
            System.out.println(2*n+3*m);
    }
    public void display(double a, double b, double c)
    {
        double z,p,q;
        p=(a+b)/c;
        q=a+b+c;
        z=p*q;
        System.out.println(z);
    }
}
```

Thank You

For patient watching

&

All the best for your examinations.