Department of Computer Applications

SEMESTER : Autumn 2021-22	**EXAMINATION** : End-Semester (open book)
COURSE TITLE : Java Programming	**COURSE CODE** : CA3305
DATE : 11/12/2021	**FACULTY NAME** : Dr. Alekha Kumar Mishra
DURATION : 3 Hours (including uploading the answers)	**FULLMARKS** : 50

(Answer all questions)

(Plagiarism of answers shall be punished with negative marks.)

1. a) Write a program in java to implement a monoalphabetic cipher class with circular right rotating key. The following example explain the encryption procedure: **(6+4)**

   initial the plaintext character sequence

   abcdefghijklmnopqrstuvwxyz is substrituted to corresponding character in the initial keysequence say

   XYZLMNOPQFGHIJKRSTUVWABCDE. That means, a plaintext "hello" is encrypted as "PMHHK". Upon completion of each encryption, the keysequence is circularly shifted right by one position. In this case, the updated keysequence for the encryption of second plaintext is **EXYZLMNOPQFGHIJKRSTUVWABCD** and so on.

   Use the appropriate builting collection classes to handle the data during implementing encryption and decryption method. The decryption is the reverse of encrytion process to be performed at receiver to obtain original plaintext.

   b) Differentiate the following terms:

   i) SortedSet vs. HashSet

   ii) notify() vs notifyAll() method in Thread.

2. a) class ByteShift {   **(6+4)**

   ```
   public static void main(String args[]) {
       byte a = 34, b;
       int i;
   ```

```
    i = a << 2;
    b = (byte) (a << 2);


    System.out.println("Original value of a: " + a);
    System.out.println("i and b: " + i + " " + b);
  }
}
```

What is the output of the above code? Justlfy how the output is obtained using bit-level operation. What is the output when the a value is changed to 103? Justify this answer too with necessary steps.

b)
```
class X {
  private int a = 100;
  int b=20;
  void check() {
    Y ob1 = new Y();
    ob1.show();
  }
  class Y {
    int b = 10;
    int a = 200;
    void show() {
      System.out.println("a = " + outer_x);
      getb();
    }
  }
  void getb() {
    System.out.println(b);
  }
}

class CheckOutput {
  public static void main(String args[]) {
    X ob = new X();
    ob.check();
  }
}
```

What is the output of the above code? Justify your answer.

3. a) Write a java program using Swing to design a GUI that will store a list   **(7+3)**
   of movie names along with its imdb rating. An input text box is provided
   for user to input a value between 4 to 9. Upon entering an imdb value

and on clicking the given show button, the program should list out all the movies with imdb rating above the given value.

b) Explain the use of following terms in Java.

i) ActionListener

ii) JLayeredPane

iii) ListIterator

4. What is the benefit of using MVC architercture? Design MVC architercture using java to perform all operations and to provide all views of a Cinema Hall Ticket Booking System. **(2+8)**

5. a) Use BitSet class to demonstrate the parity bit adding and error checking process used in Link layer of network protocol stack. **(5+5)**

b) Demonstrate the use of deepEquals method of Array class with a suitable example of your own.

@@@Best of Luck@@@