 # SECTION B

Question 1 [15]

Define a class with the following specifications:

Class name: Library

Member variables:

- double fine – stores the fine amount per day
- int days – stores the number of days overdue
- double total – stores the total fine amount
- String bookId – stores the book identifier

Member methods:

void accept() – input values for days and bookId using Scanner class methods only.

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

Days Overdue	Fine per day (Rs)
Up to 7	2
> 7 to 15	3
> 15 to 30	4
> 30	5

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

BookID Days Fine/Day Total Fine

xxx xxx xxx xxx

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

Question 2 [15]

Define a class to search for a value input by the user from the list of values given below using Binary Search technique. If it is found display the message "Element found at position x", otherwise display the message "Search unsuccessful".

4.5, 8.9, 12.5, 15.7, 18.2, 22.4, 26.7, 28.9, 32.1, 37.8

Question 3 [15]

Define a class to accept a string and check if it's a FASCINATING number or not. A number is FASCINATING if when multiplied by 2 and 3, and all three numbers are concatenated, all digits from 1 to 9 appear exactly once.

Example1:

Input: 327

Output: FASCINATING number [327, 327*2 = 654, 327 *3 = 981 concatenated is 327654981 which contains all digits from 1-9]

Example2:

Input: 456

Output: Not a FASCINATING number

Question 4 [15]

Define a class to accept values into 3x3 array and display the sum of the primary diagonal and secondary diagonal.

Example:

A[][] = {{1,2,3},{4,5,6},{7,8,9}}

Output:

Primary diagonal sum = 15 (1+5+9) Secondary diagonal sum = 11 (3+5+7)

Question 5 [15]

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

void calculate(int x) - To print all factors of the number

void calculate(int x, int y) - To print all common factors of both numbers

void calculate(double x, double y) - To print the higher number and its square root

Question 6 [15]

Define a class to accept a number and check whether it is a PRONIC number or not. A number is called PRONIC if it is the product of two consecutive integers.

Example1:

Input: 42

Output: PRONIC number [6 x 7 = 42]

Example2:

Input: 84

Output: Not a PRONIC number

[Understanding/Application]