



Answer the following questions:

Total marks [90]

First question: [20]

- How Java is a platform independent programming language? [4]
- Explain the meaning of "Java is multithreaded". [3]
- Discuss are Java programs represented a major security risk? [3]
- Write a Java program to find the sum of series [$1 - X^2/2! + X^4/4! - \dots$] with N terms, ask the user to enter the values of X and N. [10]

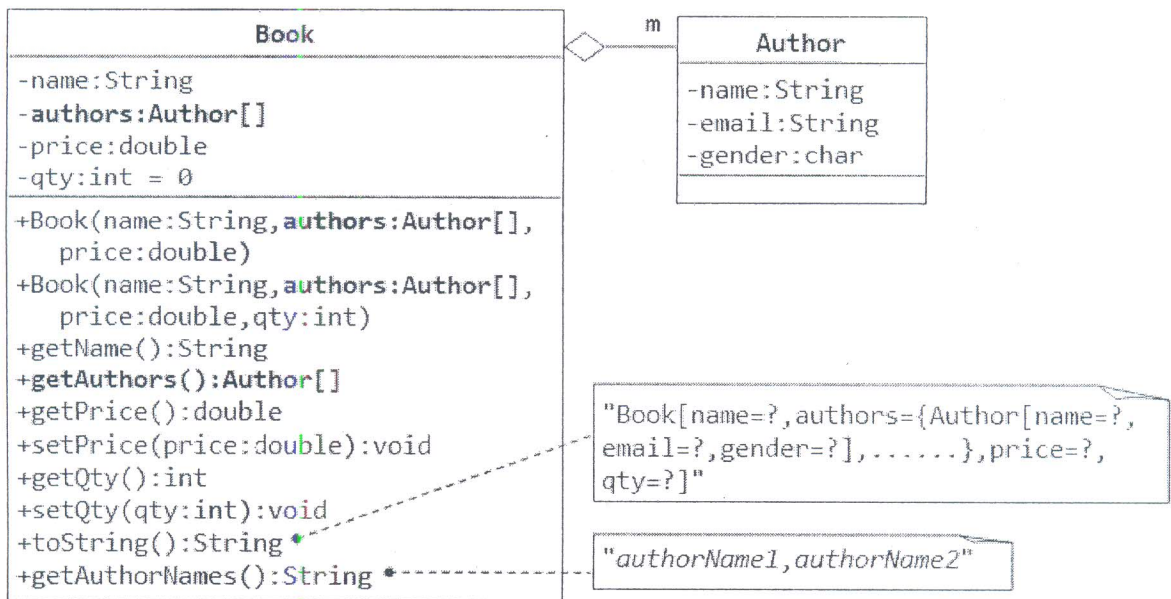
Second question: [22]

- What are the conversion rules when performing an arithmetic operation involving two operands of the different types? [3]
- Discuss can you use floating-point values for equality checking in a loop control? [3]
- Write a Java program to create a class named "Student", it contains four methods:
 - First method has (an input array of "double" data type) to return the average of the values. [4]
 - Second method has (an input array of "double" data type) to return the largest value "best". [4]
 - Third method has (an input array of "String" data type and a String value) to count the number of its occurrence. [4]
 - Fourth method has (an input array of student scores "double" data type) to return an array of their grades based on the following scheme: [4]

Grade is "Excellent"	if score is \geq best*0.85;
Grade is "Very Good"	if score is \geq best*0.75;
Grade is "Good"	if score is \geq best*0.60;
Grade is "Pass"	if score is \geq best*0.50;
Grade is "Fail"	otherwise.

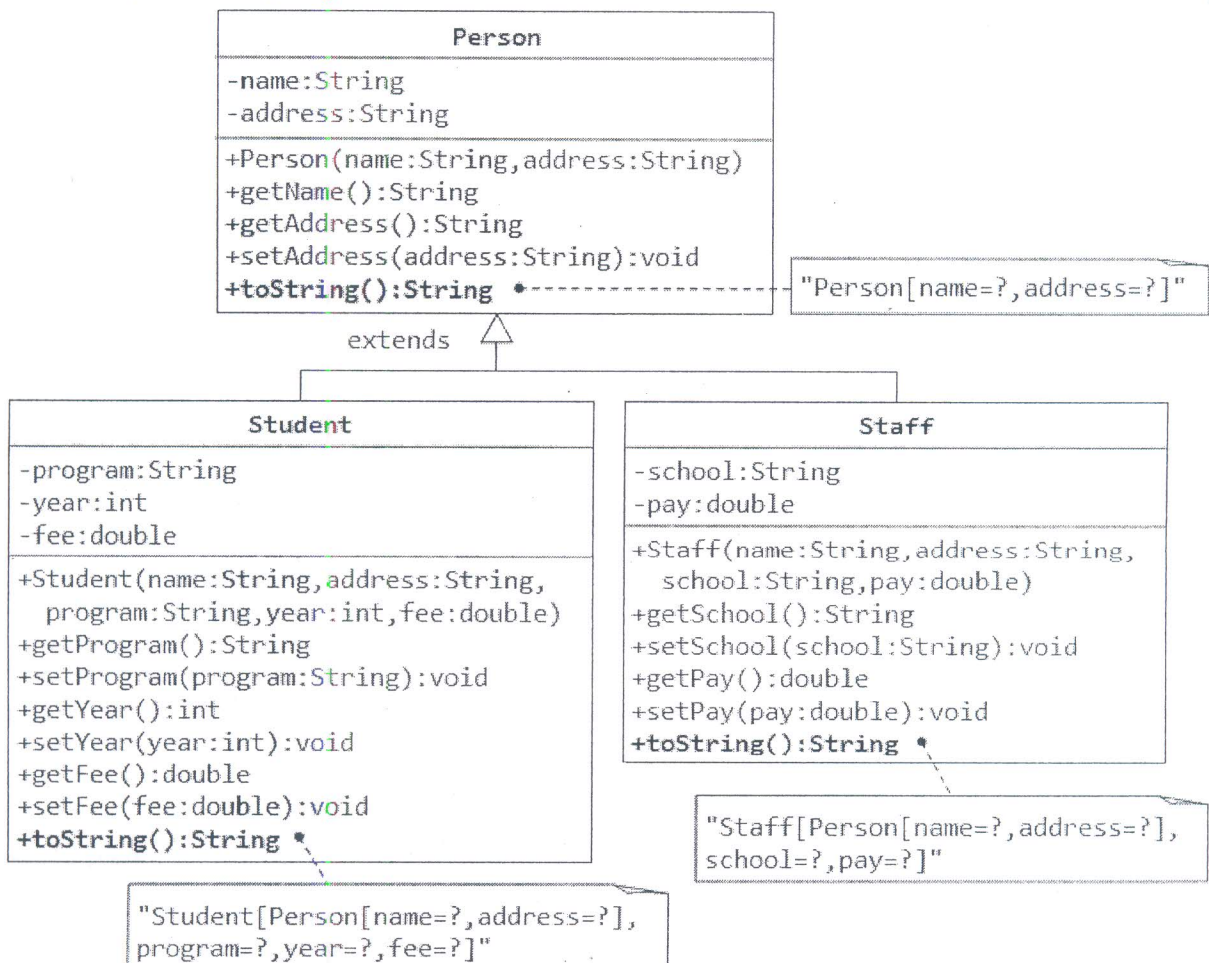
Third question: [22]

- What are the reasons to create Java packages? [3]
- What is the difference between the class and object concepts? [3]
- Write a Java program to create Book and Author classes. Test the created classes by creating an object of the Book class. [16]



Fourth question: [26]

- a) What are the features and benefits of the constructor methods? [4]
- b) What are the different means of “this” and “super” keywords? [4]
- c) Write a Java program to create Person, Student and Staff classes. Test the created classes by creating objects of the Student and Staff classes. [18]



With my best wishes
Dr. Mohamed A. El-Rashidy