1. What are syntax error(compile errors),runtime errors,and logic errors?(P22 1.42)(P20)
2. Give examples of sytanx errors,runtime errors,and logic errors. (P22 1.42)(P20)
3. What are the naming conventions for class names,method names, constants,and variables?Which of the following items can be a constant,a method, a variable, or a class according to the Java naming conventions?（P44 2.8）（P38）

**MAX\_VALUE** **Test**  **read** **readDouble**

4.（Palindrome number）Write a program that prompts the user to enter a three-digit interger and determines whether it is a palindrome number.A number is palindrome if it reads the same from right to left and from left to right.Here is a sample run of this program: (P110 3.12)(P94)

**Enter the three-digit number :121 is a palindrome.**

**Enter the three-digit number :123 is not a palindrome.**

5.(Randdom character) Write a program that displays a random uppercase letter using the **Math.random()** method.(P154 4.16 P130)

6.(Find numbers divisible by 5 or 6,but not both) Write a program that displays all the numbers from 100 to 200, ten per line, that are divisible by 5 or 6 but not both.Numbers are separated by exactly one space.(P193 5.11 P164)

7.What is method overloading? Is it permissible to define two method that have the class that have the same name but different parameter types? Is it permissible to define two methods in a class that have identical method names and parameter lists but different return value types or different modifiers?(P221 6.15 P187)

8.(Sum the digits in an integer)Write a method to computer the sum of the digits in an integer. Use the following method header:(P234 6.2 P198)

**Public static int** sumDigits (**long** n) example: sumDigits(234)returns(2+3+4).

9.(Use the IsPrime Method)Listing 6.7,PrimeNumberMethod.java,provides the isPrime(int number)method for testing whether a number is prime. Use this method to find the number of prime numbers less than 10000(P236 6.10 P199)

10.(Assign grades)Write a program that reads student scores, gets the best score, and then assigns based on the following scheme(p276 7.1 P235)

Grades is A if score is >=best-10

Grades is B if score is >=best-20;

Grades is C if score is >=best-30;

Grades is D if score is >=best-40;

Grades is F ovewise.

The program prompts the users to enter the total numbers of student, then prmpts the user to enter all of the scores, and concludes by displaying the grades. Here is a sample run:

**Enter the number of students:2**

**Enter 4 scores: 40 55**

**Student 0 score is 40 and grade is C**

**Student 0 score is 55 and grade is B**

11.(Average an arrary)Write two overload methods that return the average of an array wuth the following headers:

**Public static int average(int [ ] array)**

**Public static double average(double [ ] array)**

Write a test program that prompts the user to enter ten double ***and int*** values,invokes this method, and displays the average value. (P277 7.8 P236)

12.(Find the smallest element) Write a method that find the smallest element in an array of double values using the following header.(P278 7.9 P236)

**Public static double min(double[ ] array)**

Write a test program that prompts the user to enter ten numbers, invokes this ,method to return the minimum value, and displays the minimum value. Here is a sample run of this program.

**Enter ten numbers: 1.9 2.5 3.7 2 1.5 6 3 4 5 2**

**The minimum number is :1.5**

13.(Sum the major diagonal in a matrix)Write a method that sums all the numbers in the major diagonal in an n\*n matrix of **double** values using the following header: (P306 8.2 P258)

**Public static double sumMajorDiagonal (double[ ][ ] m)**

Write a test program that reads a 4-by-4 matrix and displays the sum of all its elements on the major diagonal. Here is a sample run:

**Enter a 4-by-4 matrix row by row:**

**1 2 3 4.0**

**5 6.5 7 8**

**9 10 11 12**

**13 14 15 16**

**Sum of the elements in the major diagonal is 34.5**

14.(Sort students on grades) Rewrite Listing 8.2, GradeExam.java, to display the students in increasing order of the number of correct answers.(P306 8.3 P259)(Array.sort P230)

15.What are the difference between constructors and methods?(P329 9.5 P278)

16.What is an accessor method? What is a mutator method? What are the naming convention for accessor methods and mutator methods?(P347 9.20 P293)

17.Describe the difference between passing a parameter of a primitive type and passing a parameter of a reference type. Show the output of the following programs: (P349 9.23 P295)

18.Describe the role of the **this** keyword.(P358 9.32 P303)

19.(The **Account** class)Design a class named **Account** that contains:

* A private **int** data field named **id** for the account(default 0).
* A private **double** data field named **balance** for the account(default 0).
* A private **double** data field named **annualInterestRate** that stores the current interest rate (default 0). Assume all accounts have the same interest rate.
* A private **Data** data field named dataCreated that stores the date when the account was created.
* A no-ar**g** constructor that creates a default account.
* A constructor that creates an account with the specified id and initial balance.
* The accessor and mutator method for **id,balance,** and **annualInterestRate.**
* The accessor method for **dateCreated.**
* A method named **getMonthlyInterestRate()** that returns the monthly interest rate.
* A method named **getMonthlyInterest()** that returns the monthly interet.
* A method named **withdraw** that withdraws a specified amount from the account.
* A method named **deposit** that deposits a specified amount to the account.

Draw the UML diagram for the class and then implement the class.