King Fahd University of Petroleum and Minerals

College of Computer Sciences and Engineering

Information and Computer Science Department

**First Semester 2014/2015 (141)**

**ICS 102 - Introduction to Computing-I**

Midterm Examination

Saturday, 8th November 2014

Time: 120 minutes

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| ***Name:*** |  |

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| ***ID#:*** |  |  |  |  |  |  |  |  |  |

***Please circle your section number below:***

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| Section | 01 | 02 | 04 |  |
| Instructor | Said | Garout | Garout |  |
| Day and Time | UT  08:00-08:50 | UT  10:00- 10:50 | UT  09:00 - 09:50 |  |

|  |  |  |
| --- | --- | --- |
| Question # | Maximum Score | Score |
| 1 | 21 |  |
| 2 | 18 |  |
| 3 | 16 |  |
| 4 | 20 |  |
| 5 | 25 |  |
| **Total** | **100** |  |

***~Good Luck~***

**Question#1 (21 points):**

1. A Java compiler converts a Java program into an intermediate language representation called

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Show the correct order of evaluation for the Java operators in the following expression:

(2 + 3)<= 4 | a == b & ! ((c + 3) \* 2 < 4)

1. Convert the given mathematical expression into an equivalent Java expression:

|  |  |
| --- | --- |
| **Mathematical Expression** | **Java Expression** |
|  |  |

1. Convert the following if-structure into an equivalent switch statement. Assume that x is of type int.

|  |  |
| --- | --- |
| if-structure | Equivalent switch statement |
| if(x == 4 || x == 6 || x == 8)  System.out.printf("even");  else if(x == 5 || x == 7)  System.out.printf ("prime");  else if(x == 9)  System.out.printf("odd");  else  System.out.printf("Wrong input"); |  |

1. Convert the following do-while loop into an equivalent while-loop:

|  |  |
| --- | --- |
| do-while | Equivalent while-loop |
| do{  x = scanner.nextInt();  if(x <= 0)  System.out.println("Error ! ");  } while(x <=0); |  |

1. A Scanner object **kbscanner** is used to read an integer from the keyboard. Write a **try-catch** block that will terminate the program if there is an **InputMismatchException**

1. How many times is the **System.out.print** statement executed in the following nested loops:

for(int k = 5; k >= 1; k--)

for(int m = 2; m <= k; m++)

System.out.print("A ");

**Question#2 (18 points):**

What is the output of each of the following Java program fragments? If a fragment will cause an error, mention the error.

|  |  |  |
| --- | --- | --- |
|  | Program Fragment | Output |
| 1. | int k = 10;  if(k > 8)  System.out.print("A");  else if(k > 6)  System.out.print("B");  if(k > 8)  System.out.print("C");  if(k > 6)  System.out.print("D"); |  |
| 2. | int x = 5;  switch (x) {  case 4 : x += 2;  System.out.print(x);  break;  case 5 : x += 3;  System.out.print(x);  case 3 : x++;  System.out.print(x);  case 7 : x += 2;  break;  case 8 : x--;  }  System.out.print(x); |  |
| 3. | int x = 10;  if (x > 15)  x = 0;  System.out.println(x);  else  System.out.println(x + 5); |  |
| 4. | int number, digits,sum;  digits=sum=0;  number=345;  do {  sum+=number%10; number=number/10;  digits++;  System.out.printf("%d\*%d%n",digits,sum);  }while(number>0); |  |
| 5. | int m, n = 3;  for(int k = 1; k <= 5; k++){  m = k;  while(m <= 5){  System.out.print(n);  m++;  }  n++;  System.out.println();  } |  |
| 6. | String str1 = "I am a student";  int k = str1.lastIndexOf('a');  System.out.println(k);  String str2 = str1.substring(k);  System.out.println(str2);  String str3 = str1.substring(0, k);  System.out.println(str3); |  |

**Question#3(16 points):**

An internet shop charges 5.00 Saudi Riyals per hour for the first 4 hours of service. The charge in excess of 4 hours is 3.00 Saudi Riyals per hour.

Write a complete Java program that prompts for and reads the amount of service for a customer in minutes. If the input is zero or negative, the program displays an error message and then terminates; otherwise, it computes and displays the charge for the customer in Saudi Riyals.

**Sample Program Execution:**

**Enter service duration [minutes]: 369**

**The charge for 369 minutes is 26.45 Saudi Riyals**

**Question#4 (20 points):**

Write a Java program that prompts for and reads an integer **n**. If **n** is zero or negative the program displays an error message and then prompts again for an integer **n**; otherwise, if n > 0, the program displays the divisors of n

Sample program run:

**Enter an integer > 0: 10**

**Number 10 has the following divisors:**

**1 2 5 10**

**Question#5: [25 points]**

Each line of a text-file sales.txt contains the ID of a salesperson and the number of his sales of a particular item. Write a Java program that reads the text-file and then writes to an output text-file commission.txt the ID and the commission of each sales person followed by the total number of sales and the total commission.

A salesperson takes commission on the following basis:

|  |  |
| --- | --- |
| SALES | COMMISSION |
| SALES <= 500 | 2 % of SALES |
| SALES in excess of 500 but not in excess of 5000 | 5 % of SALES |
| SALES in excess of 5000 | 8 % of SALES |

Example: The commission for 6000 sales is 2% of 500 + 5% of 4500 + 8% of 1000

Sample sales.txt:

200230 6000

200300 400

200650 8542

200720 5254

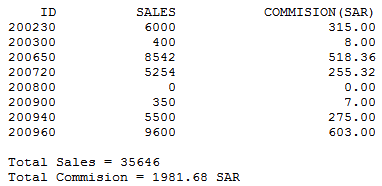
200800 0

200900 350

200940 5500

200960 9600

Sample commission.txt:



Note: Your program must be general; it must work for any number of ID and sale pairs in sales.txt