SUMMER VACATION HOMEWORK 2014 CLASS XII

Mathematics:
1. Define inverse – t function, its principal value and write all formulae
2. Solve 10 problems from exercise (inverse trig function)
3. Define differentiation and its geometrical meaning
4. All std result and rule of differentiation and inverse trig function
5. Solve 40 questions from exercise (differentiation)
6. Solve 20 problems based on application of derivative (mean value theorem/max & min)

Computer Science:

Prog 1: Wap to find the sum of the series;
a) \( s = \frac{(1+2)}{(2*3)} + \frac{(2+3)}{(3*4)} + \frac{(3+4)}{(4*5)} \ldots \frac{1}{n} \)
b) \( S = 1 + \frac{a2}{2!} + \frac{a4}{4!} + \frac{a6}{6!} + \ldots \frac{an}{n!} \)

Prog 2: Wap to enter a number containing there digits or more. Arrange the digits of the entered number in ascending order and display the result.
Input: Enter a number 4972 Sample output 2,4,7.9

Prog 3: A number is said to be Composite if the number has more than one factor excluding 1 and number itself. Wap to enter a number and check whether it is a Composite number or not.
The program terminates as soon as the user enters 0 (Zero)
Eg; 4,6,8,9......................... are the Composite numbers.

Prog 4: Write a program using a function called area () to output the area of:-
(a) circle (p*r2), where p=3.14 (b) square (side * side)
(c) Rectangle (length* breadth)
Display the menu to output the area as per the user’s choice:

Prog 5; A unique-digit integer is a positive integer (without landing zeros) with no duplicate digits. For example 7, 135,214 are all unique-digit integers whereas 33,3121,300 are not.
Given two positive integers m and n, where m,n, write a program to determine how many unique-digit integers are there in the range between m and n (both inclusive) and output them.
The input contains two positive integers m and n, assume m<30000 and n <30000. You are to input the number of unique-digit integers in the specified range along with their values in the format specified below:
Sample date:
Input m and n:
m=100
n=120
Output:
THE UNIQUE-DIGIT INTEGERS ARE:
102,103,104,105,106,107,108,109,120
FREQUENCY OF UNIQUE-DIGIT INTEGERS IS:9

Prog 6: write a program to input long integer data not less then 5 digits, Your program it should if data is less then 5 digits and ask to reenter. In the input last four digits will be taken as year (the validity of the year should be checked that the year should be within 1900 to 3000, both Inclusive otherwise the computer should reject the Input and ask to reenter data) and remaining digits as total number of days. Your program should display the output as actual data (using number of days extracted) followed by month name actual year.
Test you program for the following data and some random data.
Sample Input : 272008
Prog 7: Write a program to input a natural number less than 10000 and then output it in words.

Test your program for the following set of data:

Input: 29  Output: TWENTY NINE
Input: 17  Output: SEVENTEEN
Input: 119 Output: ONE HUNDRED NINETEEN
Input: 225 Output: TWO HUNDRED TWENTY FIVE

Prog 8: Create a single subscripted array of n>0 integers (if one tries to give, the value of n less zero, computer should reject and ask for new integer).

Rearrange the same array (do not use another array) in such a manner that the greatest number should be placed at the middle, on its right second greatest, on the left side of greatest and so on.

Example: Let n=8
Input: 9,2,1,10,6,4,8,5,3

Sample input: the elements of the original array:

```
  69  45  49  25  38  40  34  55  29
```

Sample output: the elements of the array after rearranging them are:

```
  25  34  40  49  69  55  45  38  29
```

Prog 9: A square matrix is the matrix in which number of rows is equal to the number of columns. Thus, a matrix of order n*n is a Square Matrix.

Write a program in java to fill the numbers in a circular fashion (clockwise) with natural numbers from 1 to n^2, taking n as an input.

e.g.: if n=4, then n^2 = 16, then array is filled as:

```
1  2  3  4
12 13 14 15
11 16 15 16
10  9  8  7
```

Prog 10: Consider the sequence of natural numbers

1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,.....

Removing every second number form the sequence

1,3,5,7,9,11,13,15,17,19,21,23,25,27,29..................

Removing every third number the above sequence

1,3,7,9,13,15,19,21,25,27..................
This process continues indefinitely by removing the fourth, fifty........and so on, till after a fixed number of steps, certain natural numbers remain indefinitely. These are know as Lucky Numbers, Write a program to generate and print Lucky Numbers less than a given natural number n where n <= 50.

Sample input: n=10
Output: The lucky numbers less then 10 are : 1 3 7
Sample input : n=25
Output : The lucky numbers less then 25 are : 1 3 7 13 19

Prog 11: Write a program in java to store few English alphabets in a single dimensional array. Arrange all the alphabets in another array in such a way that the consonants follow the vowels. Display the arranged alphabets of the array.

Sample input:
```
k b l a d e g u t p z
```

Sample Output :
```
i a e u k b d g t p z
```

Prog 12: A square matrix is the matrix in which number of rows equals the number of columns matrix of order n*n is called as square Matrix.

Write a program in java to fill the cells of matrix in a circular fashion (clock-wise) with natural numbers from 1 to n2. taking n as an input. Input n is odd number and elements start filling from the central cell.
e.g. if n= 5, then n2 = 25, then the array is filled as:
```
21 22 23 24 25
20 7 8 9 10
19 6 1 2 11
18 5 4 3 12
17 16 15 14 13
```

Prog 13: Write a program in java to enter certain alphabets in a double dimensional array m*n (Where m is the number of rows and n is the number of columns).

Display the elements of the matrix. Replace all the vowels of the matrix with the ‘*’ Display the new matrix.
```
w e d f
g t a k
f h o j
z u b m
```
```
w * d f
g t * k
f h * j
z * b m
```

Prog 14: Write a program in java to generate first 20 terms of the Fibonacci series in a descending order store them in a single dimensional array. Store the number in another array in ascending order, which are prime Fibonacci and display the result.

Sample Input:
```
89 55 34 21 13 8 5 3 2 1 1
```
Prog 15: Write a program to input and store n integers (n>0) in a single subscripted variable and print each number with their frequency of existence. The output should contain number, asterisk symbol and its frequency. The output should be displayed in separate lines.

Sample Output:

<table>
<thead>
<tr>
<th>Number</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>4</td>
</tr>
<tr>
<td>14</td>
<td>3</td>
</tr>
<tr>
<td>16</td>
<td>2</td>
</tr>
<tr>
<td>18</td>
<td>2</td>
</tr>
<tr>
<td>20</td>
<td>3</td>
</tr>
</tbody>
</table>

Prog 16: The computer department of the Agency of International Espionage is trying to decode intercepted massages. The agency's spices have determined that the enemy encodes massage by first converting all characters to their ASCII value and then reversing the string.

For example, consider A_z (the underscore is just to highlight the space). The ASCII value of A<space>. z are 65,32,122 respectively, Concatenate then to get 6532122, then reverse this coded massages.

Write a program which reads a coded massage will not exceed 200 characters. It will contain only alphabets (A.........Z, and a.............z) and spaces, ASCII value of A........Z are 65............90 and those of a........z are 97...........122. Test your program for the following data and some random data.

SAMPLE DATA

INPUT

Encoded Massages: 23121798623110199501872379231018117927

OUTPUT

THE DECODED MESSAGE: Have a nice day *

Prog 17: The manager of a company wants to analyse the machine usage from the records to find the utilization of the machines. He wants to know how long each user the machine used. When the user wants to use machine he must login to the machine and after finishing the work he must log off the machine.

Each long record consists of:

User identification number:
Login time and date.
Logout time and date.
Time consists of:
Hours
Minutes
Date consists of:
Day
Month

You may assume all logins and logouts are in the same year and there are 100 users at most. The time format is 24 hour machine hours and minutes.

Design a program:

(a) To find the duration for which each user has logged. Output all records along with the duration in hours.
Output the record of the user who logged for longest duration. You may assume that no user will login for more then 48 hours.

Test your program for the following data values and some more random data.

**SAMPLE DATA:**

**INPUT:** Number of users: 3

<table>
<thead>
<tr>
<th>User identification</th>
<th>Login Time &amp; Date</th>
<th>Logout Time &amp; Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>149</td>
<td>20:10</td>
<td>2:50</td>
</tr>
<tr>
<td>173</td>
<td>12:30</td>
<td>12:30</td>
</tr>
<tr>
<td>142</td>
<td>16:20</td>
<td>16:30</td>
</tr>
</tbody>
</table>

**OUTPUT:**

<table>
<thead>
<tr>
<th>User identification</th>
<th>Login Time &amp; Date</th>
<th>Logout Time &amp; Date</th>
<th>Duration Hours: Mins</th>
</tr>
</thead>
<tbody>
<tr>
<td>149</td>
<td>20:10</td>
<td>2:50</td>
<td>6:40</td>
</tr>
<tr>
<td>173</td>
<td>12:30</td>
<td>12:30</td>
<td>24:00</td>
</tr>
<tr>
<td>142</td>
<td>16:20</td>
<td>16:30</td>
<td>00:10</td>
</tr>
</tbody>
</table>

Prog. 18: A wondrous square is an a by n grid which fulfills the following conditions:

1. It contains integers from 1 to n². Where each integer appears only once.
2. The sum of integers in any row or column must add up to 0.5 *n* ( n² +1).

For example the following grid is a wondrous square where the sum of each row or column is 65 when n = 5:

```
  17  24  1  8  15
  23  5  7 14  16
   4  6 13 20  22
  10 12 19 21  3
  11 18 25  2  9
```

Write a program to read n (2 <= n <= 10) and the values stored in these n by n cells and output if the grid represents a wondrous square or not.

Also output all the prime number in the grid along with their row and column index as shown in the output. A natural number is said to be prime if it has exactly two divisors. E.g. 2,3,5,7,11 ....

The first element of given i.e. 17 is sorted at row index 0 and column index 0 and the next element in the row i.e. 24 is sorted at row index 0 and column index 1, text your program for the following data and some random data.

**Sample data**

**INPUT**

N= 4

```
16  15  1   2
 6  4   10  14
 9  8   12  5
 3  7   11  13
```

**OUTPUT**

Use it represents a Wondrous Square

<table>
<thead>
<tr>
<th>PRIME</th>
<th>ROW INDEX</th>
<th>COLUMN INDEX</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>3</td>
<td>1</td>
</tr>
</tbody>
</table>
INPUT:
N = 3
1 2 4
3 7 5
8 9 6
OUTPUT:
NOT A WONDROUS SQUARE

PRIME ROW INDEX COLUMN INDEX
2 0 1
3 1 0
5 1 2
7 1 1

INPUT:
N = 2
2 3
3 2
OUTPUT:
NOT A WONDROUS SQUARE

PRIME ROW INDEX COLUMN INDEX
2 0 0
2 1 1

Prog 19: A positive natural number (e.g. 27) can be represented as follows:
2+3+4+5+6+7
8+9+10
13+14

Where every row represents a combination of consecutive natural numbers, which add up to 27.
Write a program which inputs a positive natural number N and prints the possible consecutive number combinations which add up to N.
Test your program for the following data and some random data.

SAMPLE DATA
INPUT:
N = 9
OUPUT:
45

2 3 4

INPUT:
N = 15
OUPUT
78
1 2 3 4 5
4 5 6

INPUT:
N = 21

1 2 3 4 5 6
4 5 6

Prog 20: Code a JAVA program to round off a real entered number N up to D digits after the decimal.
Sample Data
Input (N): 123.67898
Round off (d): 3
The rounded value: 123.679
**Home Science:**
Market Survey of packaged goods such as food stuff (biscuits, chips, jams etc.) other goods (hair dyes, shampoo, soap) etc. to investigate whether consumer protection norms of labeling are being followed.
Make a project file on the above topic.

**Environmental Science:**
Do the given project work.

**Physics:**
Project work and numerical (ray optics).

**Chemistry:**
1. Metallurgy of aluminium, zinc, copper, silver
2. Preparation of silver nitrate, potassium dichromate, potassium permanganate and their structure
3. Project topics given according to roll number

**Literature:**
1. Write a detailed summary of Act III in Arms and the Man.
2. Justify the title of the poem 'The last ride together'.
3. Write the summary of the story ‘A very old man with enormous wings, highlighting the characteristics of the Old man’.

**Language:**
1. Each one of us has a lot of neighbours. Some of them are good, some are not so good. Describe in detail two of your neighbours, one who according to you is good, and the other not so good .......... your composition should include a description of their personalities and why you like or dislike them.
2. Write a travel brochure.

**Accounts:**

**Project – 1**
After doing their graduation Arvind suggested to his class mates Bimal, Charu and Deepak to form a partnership, to sell the school uniforms. All of them agreed to form a partnership on the following terms.
1. Name of firm: Yuvraj Kid Garments
2. Business: Manufacturing Business of Kid Garments
3. Arivnd will contribute ₹ 2,00,000; Bimal ₹ 80,000; Deepak ₹ 7,00,000 and Charu will be a partner without capital.
4. Profit will be shared amongst Arvind, Bimal, Charu and Deepak in the ratio of 3 : 2 : 1 : 4 respectively.
5. Interest on capital will be allowed @ 5% p. a.
6. Charu gets commission of ₹ 30,000.
7. Bimal gets ₹ 40,000 as annual salary.
8. Interest on drawings to be charged @ 10% p. a.
9. 10% of the profits to be transferred to Reserve Fund.
10. All the transactions should be made through bank.

They started business on 1\textsuperscript{st} April, 2011 and deposited the whole amount of capital, in ICICI Bank. They purchased a running factory of Yuvraj Garments consisting of Factory Land and Building ₹ 4,00,000, Plant and Machinery ₹ 3,50,000, Furniture ₹ 50,000, stock ₹ 90,000 but agreed to pay ₹ 9,50,000 as purchase consideration. They later approached their banker for a loan to meet the working capital requirement. Bank advanced loan amounting to ₹ 4,00,000 @ 10% p. a. They purchased a computer for ₹ 30,000. The transactions for the year ending 31\textsuperscript{st} March, 2012 were as follows.

<table>
<thead>
<tr>
<th>Transactions</th>
<th>₹</th>
<th>Transactions</th>
<th>₹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total purchase [₹ 4,10,000 in cash]</td>
<td>12,40,000</td>
<td>Insurance premium</td>
<td>12,100</td>
</tr>
<tr>
<td>Total sales [₹ 5,25,000 in cash]</td>
<td>20,50,000</td>
<td>Conveyance charges</td>
<td>13,200</td>
</tr>
<tr>
<td>Wages</td>
<td>2,30,000</td>
<td>Paid to creditors</td>
<td>6,50,000</td>
</tr>
<tr>
<td>Carriage inwards</td>
<td>20,500</td>
<td>Bills receivable received</td>
<td>1,00,000</td>
</tr>
<tr>
<td>Power and lighting</td>
<td>15,500</td>
<td>Bills accepted in favour of creditors</td>
<td>80,000</td>
</tr>
<tr>
<td>Staff salary</td>
<td>1,25,000</td>
<td>Advertising</td>
<td>16,700</td>
</tr>
<tr>
<td>Postage and calls</td>
<td>4,200</td>
<td>Received from debtors</td>
<td>12,10,000</td>
</tr>
<tr>
<td>Printing and stationery</td>
<td>3,800</td>
<td>10% fixed deposit</td>
<td>5,00,000</td>
</tr>
</tbody>
</table>

Drawings made during the year:
Arvind. ₹ 2,500 at the beginning of each month
Bimal. ₹ 1,500 at the last of each month
Charu. ₹ 1,000 at the middle of each month

Adjustments:
1. Closing stock is valued at ₹ 1,10,000.
2. Depreciate Land & Building by 5%, Plant & Machinery and Furniture by 10% and Office Equipment by 25%.
3. Salary outstanding ₹ 8,000 and wages outstanding ₹ 15,000.
4. Insurance premium prepaid ₹ 1,200.
5. Accrued interest on investments ₹ 25,000.

Required:
1. Journalise these transactions and post them into ledger accounts and prepare Trial Balance.

Project – 2
From the following Balance Sheet of Raja Ltd. for the year ended 31\textsuperscript{st} March 2013, prepare Cash Flow Statement as per AS – 3 and give comments on the performance of the company.
### I. EQUITY AND LIABILITIES

(a) Shareholders’ Funds

<table>
<thead>
<tr>
<th>Particulars</th>
<th>31-03-12</th>
<th>31-03-13</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share Capital</td>
<td>2,50,000</td>
<td>3,00,000</td>
</tr>
<tr>
<td>Reserves and Surplus</td>
<td>65,000</td>
<td>92,000</td>
</tr>
</tbody>
</table>

(b) Non-Current Liabilities

<table>
<thead>
<tr>
<th>Particulars</th>
<th>31-03-12</th>
<th>31-03-13</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long Term Borrowings [Bank Loan]</td>
<td>60,000</td>
<td>--</td>
</tr>
</tbody>
</table>

(c) Current Liabilities

<table>
<thead>
<tr>
<th>Particulars</th>
<th>31-03-12</th>
<th>31-03-13</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trade Payables</td>
<td>1,70,000</td>
<td>1,67,000</td>
</tr>
<tr>
<td>Short Term Provisions [Provision for Tax]</td>
<td>22,000</td>
<td>29,000</td>
</tr>
</tbody>
</table>

**Total** 5,67,000 5,88,000

### II. ASSETS

Non-Current Assets

(a) Fixed Assets – Tangible

<table>
<thead>
<tr>
<th>Particulars</th>
<th>31-03-12</th>
<th>31-03-13</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed Assets – Tangible</td>
<td>3,40,000</td>
<td>3,45,000</td>
</tr>
<tr>
<td>Fixes Assets – Intangible [Goodwill]</td>
<td>--</td>
<td>6,000</td>
</tr>
</tbody>
</table>

(b) Current Assets

<table>
<thead>
<tr>
<th>Particulars</th>
<th>31-03-12</th>
<th>31-03-13</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inventories</td>
<td>1,80,000</td>
<td>1,70,000</td>
</tr>
<tr>
<td>Trade Receivables</td>
<td>60,000</td>
<td>70,000</td>
</tr>
<tr>
<td>Cash and Cash Equivalents</td>
<td>(13,000)</td>
<td>(3,000)</td>
</tr>
</tbody>
</table>

**Total** 5,67,000 5,88,000

---

### Notes to Accounts

<table>
<thead>
<tr>
<th>Note No.</th>
<th>Particulars</th>
<th>31-03-12</th>
<th>31-03-13</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Reserves and Surplus</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>General Reserve</td>
<td>35,000</td>
<td>58,000</td>
</tr>
<tr>
<td></td>
<td>Profit and Loss Balance</td>
<td>30,000</td>
<td>34,000</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>65,000</td>
<td>92,000</td>
</tr>
<tr>
<td>2</td>
<td>Tangible Fixed Assets</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Land and Building</td>
<td>2,00,000</td>
<td>1,90,000</td>
</tr>
<tr>
<td></td>
<td>Plant and Machinery</td>
<td>1,40,000</td>
<td>1,55,000</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>3,40,000</td>
<td>3,45,000</td>
</tr>
<tr>
<td>3</td>
<td>Cash and Cash Equivalent</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cash in Hand</td>
<td>5,000</td>
<td>12,000</td>
</tr>
<tr>
<td>Bank Overdraft</td>
<td>(18,000)</td>
<td>(15,000)</td>
<td></td>
</tr>
<tr>
<td>---------------</td>
<td>----------</td>
<td>----------</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>(13,000)</td>
<td>(3,000)</td>
<td></td>
</tr>
</tbody>
</table>

**Additional Information**
(a) Tax paid during year ₹ 26,000.
(b) Depreciation on Plant and Machinery ₹ 14,000.
(c) Dividend paid ₹ 25,000.
(d) Sale of Building at cost.
(e) Purchase of Plant and Machine during the year ₹ 29,000.

**Commerce:**

**Project – 1**
Compare the interest rate offered by five different commercial banks. Commercial bank related to fixed deposits under various categories and various time durations. Find out the procedure and formalities for opening a saving bank account and a fixed deposit account.

**Project – 2**
Select any two companies in the same industry of your own choice and find out the marketing activities performed by that company to promote products.

**Economics:**
1. Make a comparative study of lending performance of 5 commercial banks in the past 10 years with reference to change in Cash Reserve Ratio and Statutory Liquidity Ratio.
2. Make a comparative study of the allocation of resources of the Central Government. Budget on the agriculture, defense, industry and education for the last 10 years.
3. Compare the contribution made by different sectors of the economy towards GDP growth during the planning period.
4. Prepare a trend analysis of growth and productivity of any one industry such as textile, automobile, electricity, telecommunications etc in India for the past 10 years.