NATIONAL PUBLIC SCHOOL
HSR, BANGALORE

Worksheet No. : NPSHSR/2023-24/AS/GR11/01 **Date: 05-07-2023**

Topic: Flow of Control

Q1.Write a python program to the annual taxable income of the person. Calculate the income tax and TDS to be paid by the person as per the given condition:-

Income Tax Rates	FY 2023-24 Income Tax Slab
NIL	Rs.0 - Rs.3 lakh
5%	Rs.3 lakh - Rs.6 lakh
10%	Rs.6 lakh - Rs.9 lakh
15%	Rs.9 lakh - Rs.12 lakh
20%	Rs.12 lakh - Rs.15 lakh
30%	Above Rs. 15 lakh

Surcharge: 10% of income tax, where total income exceeds Rs.50 lakh up to Rs.1 crore.
Surcharge: 15% of income tax, where the total income exceeds Rs.1 crore.

Cess: 3% on total of income tax + surcharge.
TDS=Total Tax/12

Q2 Write a PYTHON program to calculate the Electricity bill as charged by the Teliance Company: -
Input number of units from user and print the bill amount.
First 100 units: Rs 2.96/unit

Next 200 units (from 101 to 300): Rs 5.56/unit

Next 200 units (from 301 to 500): Rs 9.16/unit

Any units after that (above 500): Rs 10.61/unit

If bill exceeds Rs.1000 then a surcharge of 15% will be charged on the bill amount and the minimum bill should be of Rs.100/-

Q3. Write a PYTHON program to print the Fibonacci series up to n terms and also find the sum of even and odd terms of the series separately. 0,1,1,2,3,5,8…… n terms

Q4. Write an interactive PYTHON program to accept a number (integer) and check whether it is
a) Palindrome b) Prime Number c) Perfect Number
d) Armstrong Number e) Strong Number

Note:-1. ***Perfect number, a positive integer that is equal to the sum of its proper divisors. The smallest perfect number is 6, which is the sum of 1, 2, and 3. Other perfect numbers are 28, 496, and 8,128.***

2. An Armstrong number of three digits is an integer such that the sum of the cubes of its digits is equal to the number itself. For example, 371 is an Armstrong number since 3**3 + 7**3 + 1**3 = 371. Also (1634)

3. Strong number: Strong numbers are the numbers whose sum of factorial of digits is equal to the original number (145)

Q5. Write a PYTHON program to find the sum of the cos(X) series up to N terms. Input X(in radians) and N from user. $1-X^2/2! + X^4/4! .....$

Q6. Write a PYTHON program to find the sum of the sin(X) series up to N terms. . Input X(in radians) and N from user. $X/1! - X^3/3! + X^5/5! .....$

Q7. Write a PYTHON program to find the sum of the given series up to N terms.

1,(1+2),(1+2+3),(1+2+3+4),…….

Q8. Write a PYTHON program to find and print all the Pythagorean triplets' up to 1000.

Q9. Write a PYTHON program to print the patterns. Input the number of lines from the user. Example in number of lines n=4 then the patterns are:-

Pattern1

```
1
1 2
1 2 3
1 2 3 4
```

Pattern3

```
1 2 3 4
1 2 3
1 2
1
```

Pattern 2

```
      1
    1 2
  1 2 3
1 2 3 4
```

Pattern 4

```
1 2 3 4
  1 2 3
    1 2
      1
```

Pattern 5

```
      1
    1 2 1
  1 2 3 2 1
1 2 3 4 3 2 1
```

Pattern 6

```
1 2 3 4 3 2 1
  1 2 3 2 1
    1 2 1
      1
```

Q10. Write a PYTHON program to print the set of Amicable Numbers within the given integer limit.

The First Eight Amicable Pairs		
1	220	284
2	1,184	1,210
3	2,620	2,924
4	5,020	5,564
5	6,232	6,368
6	10,774	10,856
7	12,285	14,595
8	17,296	18,416

For example let's show that 220 & 284 are amicable numbers:
First we find the proper divisors of 220:
1, 2, 4, 5, 10, 11, 20, 22, 44, 55, 110
If you add up all of these numbers you will see that they sum to 284.
Now find the proper divisors of 284:
1, 2, 4, 71, 142
These sum to 220, and therefore 220 & 284 are amicable numbers.

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