SRM INSTITUTE OF SCIENCE & TECHNOLOGY KATTANKULATHUR CHENNAI

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Subject ➢ ADVANCED PROGRAMMING PRACTICE

Section ➢ W2

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Title ➢ ASSIGNMENT TUTORIAL 15

ASSIGNMENT

TUTORIAL 15

Q1) Calculate Root (2) with 100 decimal places.

CODE:

```
import mpmath

mpmath.mp.dps = 100
root_2 = mpmath.sqrt(2)
print(root_2)
```

Output:

```
>>>
== RESTART: D:\SRM\SEMESTERS\3rd SEM\Advance Programming\python\tutorial 15.py =
1.41421356237309504880168872420969807856967187537694807317667973799073247846210703885038753432764157 3
```

Q2) Calculate 1/2 + 1/3 in rational arithmetic.

CODE:

```
import sympy

num1 = sympy.Rational(1, 2)
num2 = sympy.Rational(1, 3)
```

result = num1 + num2

print(result)

Output:

```
>>> 
== RESTART: D:\SRM\SEMESTERS\3rd SEM\Advance Programming\python\tutorial 15.py =
5/6
>>> 
```

Q3) Calculate the expanded form of (x+y)^6.

CODE:

```
import sympy as sym
x=sym.Symbol('x')
y=sym.Symbol('y')
exp =sym.expand((x+y)**6)
print(exp)
```

Output:

```
>>> 
== RESTART: D:\SRM\SEMESTERS\3rd SEM\Advance Programming\python\tutorial 15.py =
x**6 + 6*x**5*y + 15*x**4*y**2 + 20*x**3*y**3 + 15*x**2*y**4 + 6*x*y**5 + y**6
>>> 
```

Q4) Simplify the trigonometric expression sin(x)/cos(x).

CODE:

```
import sympy
x = sympy.symbols('x')
expr = sympy.sin(x) / sympy.cos(x)
simplified_expr = sympy.simplify(expr)
print(simplified_expr)
```

Output:

```
>>>
========== RESTART: D:\SRM\SEMESTERS\3rd SEM\Advance Progr
tan(x)
>>>
```

Q5) Calculate lim x- >0 {sin(x) - x) / (x3)}.**

CODE:

```
import sympy

x = sympy.symbols('x')
expr = (sympy.sin(x) - x) / (x**3)
limit_result = sympy.limit(expr, x, 0)
print(limit_result)
```

Output:

```
>>>
= RESTART: D:\SRM\SEMESTERS\3rd SEM\Advance Programming\python\tutorial 15.py
-1/6
>>>
```

APP