Task#11

Interpolation

1. For the following data, obtain the *Newton-Gregory Forward Difference Polynomial*. And interpolate at x = 0.15.

x	0.1	0.2	0.3	0.4	0.5
f(x)	1.4	1.56	1.76	2	2.28

2. Use *Newton-Gregory Backward Interpolation* to estimate the value of f(x) at x=1 using following data:

x	0.1	0.3	0.5	0.7	0.9	1.1
f(x)	-1.699	-1.073	-0.375	0.443	1.429	2.631

3. Using appropriate *Newton's Interpolation Technique*, estimate y(15) and y(85) from the following data:

x	10	30	50	70	90
y	34	56	45	23	36

4. The following data are taken from the steam table

Temp. ºC	140	150	160	170	180
Pressure kgf/cm^2	3.685	4.854	6.302	8.076	10.225

Find the pressure at the temperature T = 142ºC & T = 175ºC using *Newton's Interpolation*.

5. Find the value of $\log 337.5$ from the following table by using *Gauss Forward Interpolation* formula:

x	310	320	330	340	350	360
log x	2.49136	2.50515	2.5185	2.53148	2.54407	2.5563

6. Find the value of $\sin 45º$ from the following table by using *Gauss Backward Interpolation* formula:

x = ɵ	20	30	40	50	60	70	80
y = Sin ɵ	0.342	0.502	0.6427	0.7604	0.8660	0.93919	0.98481

7. Using *Stirling's formula* find U_{28}, given:

   $U_{20} = 49225$, $U_{25} = 48316$, $U_{30} = 47236$, $U_{35} = 45926$, $U_{40} = 44306$

8. Apply *Bessel's formula* to find the value of f(27.5) from the table:

x	25	26	27	28	29	30
f(x)	4.00	3.846	3.704	3.571	3.448	3.333