

The Open University of Sri Lanka
 B.Sc/B.Ed. Degree Programme
 Open Book Test 2017/2018
 Level 05 Applied Mathematics
 ADU 5307– Numerical Methods



Duration: - One hour

Date: - 24-06-2018

Time: - 10.30 a.m. to 11.30 a.m.

Answer all questions.

1. (i) A root of the equation $x^3 - 4x - 9 = 0$ lies between 2.5 and 3.0. Using the method of false position, find this root correct to three places of decimals.
- (ii) Find a root of the equation $x^3 - 6x + 4 = 0$ by using Newton Raphson method correct to four places of decimals.

[40 Marks]

2. (i) With the usual notations prove that $\left(\frac{\Delta^2}{E}\right)e^x \cdot \frac{Ee^x}{\Delta^2 e^x} = e^x$, the interval of differencing being h .

- (ii) The number of members of a civil engineering society are given below:

x	1987	1988	1989	1990	1991
$y=f(x)$	150	192	241	--	374

Estimate the number of members in 1990.

- (iii) The following table gives the values of e^x for certain equi-distant values of x . Apply Gauss's forward interpolation formula to find the value of e^x when $x = 0.644$.

x	$y = e^x$
0.61	1.8404
0.62	1.8589
0.63	1.8776
0.64	1.8965
0.65	1.9155
0.66	1.9348
0.67	1.9542

[60 Marks]