EEP

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Mid Semester Examination – Oct 2018

Course: B. Tech in EEP **Sem: III**

Subject Name: Numerical Methods and Programming **Subject Code: BTEEC404**

Max Marks: 20 **Date:-14/03/2019** **Duration:- 1 Hr.**

Instructions to the Students:

1. **Assume Suitable Data if required.**
2. **Use of Programmable calculators is prohibited.**

Q. 1 Marks 6

1. **When Limited significant values figures are used to represent exact number it is called as _____**

   a.True Error b. Truncation Error c. Round Off Error d. Relative error

2. **What is the operation of 'det(a)' function in MATLAB**

   a. Transpose b. determinant c. inverse d. none of these

3. $\Delta f(\tilde{x}) =$ _____

   $a.\{|f'(x) - f(\tilde{x})|\}$ $b.\{|f(x) - f(\tilde{x})\}|$

   $c.|\{f(x) - f'(x)\}|$ $d.|\{f(\tilde{x}) - f'(x)\}|$

4. $\% \varepsilon_a = ?$

   $a.\frac{Approximate\ error}{True\ Value} \times 100$ $b.\frac{True\ error}{True\ Value} \times 100$

   $c.\frac{Relative\ error}{Approximate\ Value} \times 100$ $d.\frac{Approximate\ error}{Approximate\ Value} \times 100$

5. **A Maclaurin's series is a Taylor series expansion of a function about 0**

   a. True b. false

6. **Chopping is a type of round off error in which last significant digit is rounded up by '1' if the first discarded digit is greater than or equal to five.**

   a. True b. False

Q.2 **Solve Any Two of the following.** 3 X 2 =6

(A) **Suppose that you have task of measuring voltage current & power of a system. First you use analog meter which measures voltage as 239V, current is 2.9A. and power is obtained by formula (VxI). But then accurate measurement was carried out by Digital Multimeter where voltage was 228V & current was 2.2A. Find a) True Error b) True Relative Error & c) True percentage relative error in Voltage current & Power.**

(B) **Use Maclaurins series expansion to find the true value of e^x where the value of x=0.5 and also find the true percentage error.(Calculate upto 4^{th} order approximation)**

(C) **Given values of $(\tilde{x}) = 2.5$ with an error of $\Delta(\tilde{x}) = 0.01$ estimate the resulting error in function $f(x) = x^3$**