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**INSTITUTE OF INFORMATION TECHNOLOGY**

**Jahangirnagar University**

**2nd Year 1st Semester Final Examination-2020 [Written]**

**Course Title: Computational Mathematics Course Code: ICT-2105**

**Time: 45 Minutes, Plus Extra 15 Minutes for Submission Marks: 10**

**Instructions:**

1. There are Three Questions here. Answer **any TWO** (**02**) of them.
2. Marks carrying by each question are shown in the margin.
3. Upload the **pdf answer script** in the **Google Class Room**.

|  |  |  |  |
| --- | --- | --- | --- |
| **1.** | **a)** | Assume that the transfer function of a system is represented by . Using bisection method on [1,2], find and when | **1.5** |
|  | **a)** | Sundarbans is a mangrove area in the delta formed by the confluence of the Ganges, Brahmaputra, and Meghna Rivers in the Bay of Bengal. This area is the home of Royal Bengal Tigers. Estimate the number of Tigers in the Sundarbans for year 1925. | **3.5** |
|  | | | |
| **2.** | **a)** | From the following table, find the area bounded by the curve and x-axis from x=7.47 to x=7.52 using trapezoidal rule and simpson’s 3/8 rule.   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | **x** | **7.47** | **7.48** | **7.49** | **7.50** | **7.51** | **7.52** | | **f(x)** | **1.93** | **1.95** | **1.98** | **2.01** | **2.03** | **2.06** | | **2.5** |
|  | **b)** | State the limitations of Taylor series method. | **1.0** |
|  | **c)** | What type of Errors happen during Arithmetic operation of Floating-Point Numbers – explain with examples of precision. | **1.5** |
|  | | | |
| **3.** | **a)** | Write an application of LU decomposition and Gauss Elimination Methods each. | **1.0** |
|  | **b)** | Use the Runge-Kutta method with h=0.1 to find approximate values for the solution of the initial value problem: , | **4.0** |