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**INSTITUTE OF INFORMATION TECHNOLOGY**

**Jahangirnagar University**

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

**Course Title: Digital Logic Design Course Code: ICT-2103**

**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**.

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| --- | --- | --- | --- |
| 1. | a) | What is the simplest Boolean expression for the circuit shown below: | 2.5 |
|  | b) | Simplify the expression using Karnaugh maps:  F(A, B, C, D) = BC ’ + D’ (A + B’) + BCD + A’BC | 2.5 |
|  |  |  |  |
| 2. | a) | Calculate the equation of the next state for JK-flip flop. Why do we prefer flip flops instead of latches? | 3 |
|  | b) | Design a counter that counts in the sequence 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 0,..., using natural binary encoding and D-type flip-flops. | 2 |
|  |  |  |  |
| 3. |  | Discuss the working procedures of a successive approximation analog to digital converter. Also, write the pros and cons of this circuit. | 5 |