Enrolment No: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Name of Student: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Department/ School: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**END TERM EXAMINATION EVEN SEMESTER 2021-22**

|  |  |  |  |
| --- | --- | --- | --- |
| **COURSE CODE** | **CSET105** | **MAX. DURATION** | **2 HRS** |
| **COURSE TITLE** | **Digital Design** | | |
| **COURSE CREDIT** | **3-0-2** | **TOTAL MARKS** | **35** |

**GENERAL INSTRUCTIONS: -**

1. Do not write anything on the question paper except **name, enrolment number** and **department/school.**
2. Carrying mobile phone, smart watch and any other non-permissible materials in the examination hall is an act of **UFM.**

**COURSE INSTRUCTIONS:**

1. **Answers should be to the point.**
2. **If needed, make the Neat and clean Diagrams.**
3. **Question 1 has the 3 Marks and other all questions have 4 marks.**

**Max Marks: 35 Marks**

**Q1. (a).** Construct truth table of the given logic diagram. Where (D- Input, C- Clock, Q and Q’- Outputs). **[3]**

Diagram

Description automatically generated

**(b).** Explain in one sentence.

1. Drawback with S-R Flipflop.

2. Drawback with J-K Flipflop.

A close-up of a document

Description automatically generated with low confidence

**Q2.** The Following serial data are applied to FF shown in Figure. Determine the resulting serial data that appears at Q output. There is one clock pulse for each bit time. Assume initially Q=0. **[4]**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CLOCK | J1 | J2 | K1 | K2 | Q |  |
| 1st | 1 | 1 | 1 | 1 | ? 0 | ? 1 |
| 2nd | 0 | 1 | 0 | 1 | ? 0 | ? 1 |
| 3rd | 1 | 0 | 0 | 0 | ? 0 | ? 1 |

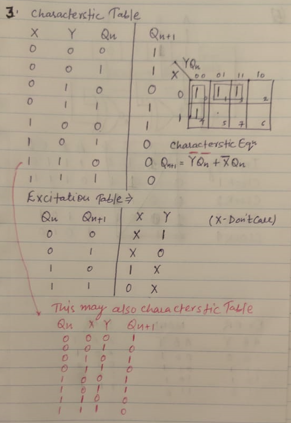
Diagram

Description automatically generated

**Q3.** A new Flip Flop (XY) is designed with the following Truth table. The previous state of XY Flip Flop is and the Next State Denoted by .For the New Flip Flop create the Characteristic Table and Excitation Table also Find the Characteristic Equation for Given Flip Flop. **[4]**

**Truth Table of XY Flip Flop**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Input | Input | Output |
| **Clock** | **X** | **Y** |  |
| 0 | Don’t care | Don’t care |  |
| 1 | 0 | 0 | 1 |
| 1 | 0 | 1 |  |
| 1 | 1 | 0 |  |
| 1 | 1 | 1 | 0 |



**Q4.** Design a 2-bit Synchronous Down Counter with detailed diagram. **[4]**

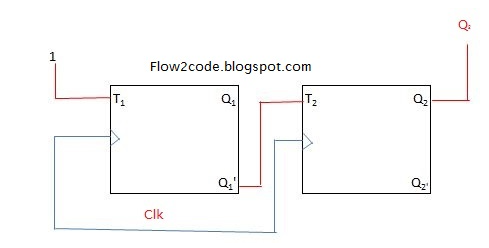
A screenshot of a computer

Description automatically generated with low confidence A picture containing diagram

Description automatically generated

A picture containing text

Description automatically generated



**Q5.**  In SIPO Register (Given in the Diagram), Find the output (A, B, C, D) after 1st clock, 2nd clock, 3rd clock, and 4th clock. **[4]**

Diagram, engineering drawing

Description automatically generated

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Clock | A | B | C | D |
| Initial (0) | 1 | 1 | 1 | 0 |
| 1st | 0 | 1 | 1 | 1 |
| 2nd | 1 | 0 | 1 | 1 |
| 3rd | 0 | 1 | 0 | 1 |
| 4th | 1 | 0 | 1 | 0 |

**Q6.** Design an asynchronous counter using T flipflop for the following sequence. **[4]**

Graphical user interface, diagram

Description automatically generated

**110 state will be converted to 000**

A screenshot of a video game

Description automatically generated with medium confidence

**(Instead of J K FF use T flip flop and Make Input Logic 1)**

**Q7.** Convert the S R Flip Flop to T Flip Flop with suitable tables and Logic expression and Logic Diagram. **[4]**

Calendar

Description automatically generated

A picture containing text, clock

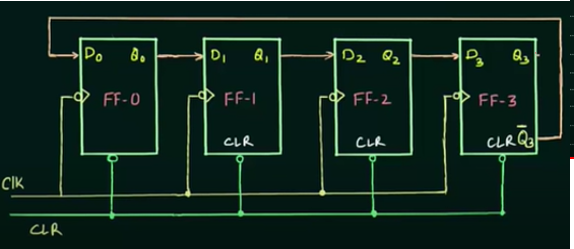
Description automatically generated

Diagram, schematic

Description automatically generated

**Q8.** Design a counter which has no. of states double of no. of Flip Flop used in that counter circuit with the suitable diagram. [4]

**Johnson Counter**



Calendar

Description automatically generated

**Q9.** Draw the Output wave form (Q) of the given JK Flip Flop for given Input waveform. (Assume previous State =1) **[4]**

Diagram

Description automatically generated Diagram

Description automatically generated

A picture containing text, whiteboard

Description automatically generated

😊😊😊ALL THE BEST😊😊😊