Mahatma Gandhi University Kottayam

VIth Semester CBCS (2017 Admission onwards) BSc Physics Practical Examinations March 2020

Core Practical 04

PH6CRP04 – Digital Electronics

Time: 3 hrs   **Maximum marks: 40**

(Attempt the question marked 'X')

1. Construct **AND, OR** and **NOT** gates by using **diodes and transistor** and verify their **truth tables**.

2. Construct **AND, OR**, and **NOT** gates by using **universal gates** (NAND and NOR) and verify their **truth tables**.

3. Verify the **truth table of NAND, NOR, XOR** and **XNOR** gates using **IC's**.

4. Verify **De - Morgan's** theorems using **IC 7400**.

5. Construct a **BCD to 7 segment decoder** and verify the **truth tables.**

6. Construct a **Half adder/Full adder** using **gates** and verify the **truth table.**

7. Construct an **astable multivibrator using transistors** and study the **wave forms** obtained. **Compare** the calculated and measured time period for different values of **R and C**

8. Construct an **astable multivibrator using IC 555** timer. Obtain and **plot** the wave forms at **pins 3 & 6. Compare** the charging and discharging **time periods** of the capacitor with the theoretical value. Repeat for **two RC** combinations.

9. Construct a **monostable multivibrator using transistors** .Observe and **plot collector and base waveforms of both the transistors**.

10. Set up **a monostable multivibrator using IC 555** times**. Study** the wave forms obtained. **Compare** the calculated and measured period for different values of **R & C.**

11. **Use IC 741** to set up a **4- bit digital to analogue (D/A) converter** using binary weighed resistor **/R -2R** ladder type and **measure** the analogue outputs for different digital inputs.

12. Using **IC 741**, Construct an **analogue to digital (A/D) converter** and measure the digital output for different analogue inputs.

13. Construct **S-R** flip flops using **IC 7400**, and verify the **truth table.**

14. Construct **J-K** flip flops using **IC 7400 and 7410.** Verify the **truth table.**

15. Construct a **digital counter using IC 7490/7495/74194/74151** and verify the **truth table**.

16. **Design and construct a Schmitt trigger using IC 741** for various **LTP** and **UTP**.

17. Construct a **Schmitt trigger using IC 741** and study the output voltage for various input voltages.

    Also measure the corresponding **LTP** and **UTP**

18. Construct a **bistable multivibrator using IC 555** timer and **study** its performance.

19. Study a **multiplexer** using **gates**, and obtain its **truth table.**

20. Study a **demultiplexer** using gates and obtain its **truth table**.

21. Set up and verify the performance of a **serial in- serial out (SISO) shift register.**

22. Construct and verify the performance of a **serial in-parallel out (SIPO) shift register.**

23. Set up **a 4 bit Binary to Gray code converter** and verify the **truth table**.

24. Construct a **4 bit Gray to Binary** code converter and verify the **truth table.**