

**2103000206021005**  
**EXAMINATION FEBRUARY-MARCH 2024**  
**BACHELOR OF SCIENCE (SIXTH SEMESTER)**  
**PHYSICS PAPER -X (PH-610-ANALOG AND DIGITAL**  
**ELECTRONICS)-LEVEL 2**

[Time: As Per Schedule]

[Max. Marks: 50]

**Instructions:**

**1. Fill up strictly the following details on your answer book**

- a. Name of the Examination : **BACHELOR OF SCIENCE (SIXTH SEMESTER)**
  - b. Name of the Subject : **PHYSICS PAPER -X (PH-610-ANALOG AND DIGITAL ELECTRONICS)-LEVEL 2**
  - c. Subject Code No : **2103000206021005**
2. Sketch neat and labelled diagram wherever necessary.
  3. Figures to the right indicate full marks of the question.
  4. All questions are compulsory.

Seat No:

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Student's Signature

**Q.1 Attempt Answer in short**

**10**

1. What is the clock cycle time for a system that uses a 50 kHz Clock?
2. Draw the Block diagram of Op-Amps.
3. In negative feedback amplifier stands for VCVS.
4. Define Schmitt trigger and TTL Clock
5. What is Summing amplifier w.r.t Op-amps?
6. What is Astable and Monostable amplifier?
7. Write oscillation frequency equation for Wein-bridge Oscillator.
8. Draw block diagram of T- F.F using JK FF.
9. Define close loop voltage gain.

10. Define CMRR and Slew rate.

**Q.2 A) Write any one of the following** **6**

1. Draw the equivalent circuit for VCVS negative feedback
2. Write short notes on Summing Amplifier.

**B) Write any one of the following** **4**

1. Draw the equivalent circuit for VCVS negative feedback
2. Draw the equivalent circuit for ICVS negative feedback.

**Q.3 A) Write any one of the following** **6**

1. Draw the circuit diagram of Colpitts's Oscillator and explain its action. Obtain condition of oscillation of this oscillator.
2. With suitable circuit diagram explain the operation of Phase-shift Oscillator. What will be frequency of Oscillation of this oscillator.

**B) Write any one of the following** **4**

1. A Hartley oscillator like  $L_1 = 1\mu\text{H}$  and  $L_2 = 0.2\mu\text{H}$ , what is the feedback fraction? The frequency of oscillation if,  $C = 1000\text{ pF}$ ? The minimum voltage gain needed to start oscillation?
2. A Wein bridge oscillator is used for a frequency range 30 Hz to 3kHz the capacitance has a range 50 pF to 500pF find out the resistance values variable required.

**Q.4 A) Write any one of the following** **6**

1. Define Multivibrator. Explain Monostable M.V using Timer.
2. Write short note on TTL clock.

**B) Write any one of the following**

**4**

1. The IC-555 timer of astable multi-vibrator has  $R_1 = 75k \Omega$ ,  $R_2 = 30k \Omega$  and  $C = 47nF$ . What frequency of the output signal?
2. Find the output pulse width for the timer monostable. Given  $R_A = 5k \Omega$  and  $C = 0.1\mu F$  and also find frequency.

**Q.5 A) Write any one of the following**

**6**

1. Write short note on Edge triggered R-S Flip flop with truth table.
2. Write short note on Master-slaves Flip-flop using J-K flip-flop.

**B) Write any one of the following**

**4**

1. Show how to convert D Flip-flop from J-K flip-flop.
2. Explain in brief R-S Flip-flop using NAND gate.

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