

RAN-2103000206021005
B.Sc. (Sem.- VI) Examination March - 2026
Physics : PH-610 (Electronics - Old)
Analog and Digital Electronics
Time: 2 Hours]
[Total Marks: 50

સૂચના : / Instructions (1) ઉપરોક્ત દર્શાવેલ વિગતો ઉત્તરવહી પર અવશ્ય લખવી. Fill up strictly the above details on your answer book	Seat No.: Student's Signature
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- Q.1. Attempt any five in short** **10**
1. Define CMRR and Slew rate.
 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 inverting amplifier w.r.t Op-amps?
 6. Define Astable and Monostable amplifier?
 7. Write resonance frequency equation for Phase shift Oscillator.
 8. Draw block diagram of T- F.F using JK FF.
 9. Define open loop voltage gain.
 10. What is the clock cycle time for a system that uses a 50 kHz Clock?
- Q.2. A. Write any one of the following** **6**
1. Draw the equivalent circuit for ICIS negative feedback
 2. Write short notes on Non-Inverting Amplifier.
- B. Write any one of the following** **4**
1. Draw the equivalent circuit for VCVS negative feedback
 2. Draw the equivalent circuit for VCIS 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 $L_1 = 1 \mu H$ and $L_2 = 0.2 \mu H$, 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 15 Hz to 3 kHz the capacitance has a range 25 pF to 500 pF find out the resistance values variable required.

- Q.4. A. Write any one of the following** **6**
1. Define Multivibrator. Explain Astable M.V using Timer.
 2. Write short note on Schmitt trigger.
- 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 is the output frequency of the signal ?
 2. Find the output pulse width for the timer monostable. Given $R_A = 5k\ \Omega$ and $C = 0.1\mu F$.
- 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 T Flip-flop from J-K flip-flop.
 2. Explain in brief R-S Flip-flop using NAND gate.
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