



K24P 3919

Reg. No. : .....

Name : .....

I Semester M.Sc. Degree (C.B.C.S.S. – OBE – Reg./Supple./Imp.)

Examination, October 2024

(2023 Admission Onwards)

PHYSICS/PHYSICS WITH COMPUTATIONAL AND NANO SCIENCE  
SPECIALIZATION

MSPHN01C04/MSPHY01C04 : Electronics

Time : 3 Hours

Max. Marks : 60

## SECTION – A

Answer any 5, each one carries 3 marks.

1. Outline block diagram representation of a typical OPAMP.
2. What are the differences between synchronous and asynchronous counters ?
3. What is the potential timing problem in flip-flop circuits ?
4. What are the different classifications of microprocessors ?
5. Explain the oscillator principles.
6. Summarize the different comparator characteristics. (5×3=15)

P.T.O.

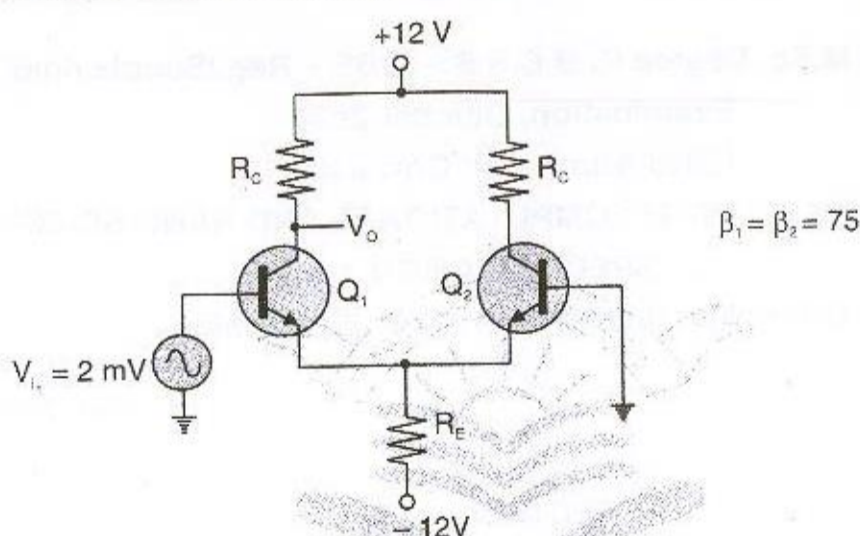
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## SECTION – B

Answer any 3, each one carries 6 marks.

7.

In the circuit shown, if  $r_i = 20 \text{ k}\Omega$ ,  $R_C = 72 \text{ k}\Omega$  and  $R_E = 48 \text{ k}\Omega$ , calculate

- a) Single-ended output voltage
  - b) Common mode gain.
8. Build a J-K flipflop by using an S-R flipflop.
  9. Categorize different flag registers.
  10. Design a synchronous 3-bit Up-down counter using J-K FFs.
  11. Make use of op-amp 1458/353 to design a triangular wave generator. (3×6=18)

## SECTION – C

Answer any 3, each one carries 9 marks.

12. Organize and explain the different functional units of the 8085 microprocessor.
13. Compare and contrast R-2R ladder type DAC and weighted resistor type DAC.
14. List and appraise different types of shift registers.
15. Justify how the inverting, noninverting and differential configurations of OPAMP are useful in applications like summing, scaling and averaging amplifiers.
16. Distinguish and explain first-order low-pass and high-pass Butterworth filters. (3×9=27)