4th Semester (B.Sc.-H) Final Internal Examination-2020
Department of Physics
Prabhat Kumar College, Contai
Paper-C10 (Analog Systems and Applications)

Group-A (Theory)

(Answer any one of the following)

Q1. What do you mean by a two stage RC coupled amplifier? Deduce the expressions for the high and low frequency gain for such an amplifier. Hence explain the effect of RC coupling on band width of the coupled amplifier.

Q2. What do you mean by a feedback amplifier? Discuss with proper examples the different types of feedback amplifier. Explain the effect of negative feedback on the input and output impedance of a feedback amplifier.

Q3. What do you mean by an oscillator? Deduce the Barkhausen's criterion for self sustained oscillation. Explain how the above criteria is fulfilled for a RC phase shift oscillator.

Q4. What do you mean by an Op-Amp? Explain the basic difference between the open loop gain and the closed loop gain of an OP-Amp. What do you mean by CMMR? With a complete mathematical background explain why is it introduced?

Q5. Explain the concept of virtual ground in an Op-Amp circuit. Deduce the expressions for the limiting frequencies to use Op-Amp as differentiators and integrator. Use proper diagram explain the function of a Schmidt triggers.

Q6. Explain the use of a feedback to reduce the noise of an amplifier. How the amplitude of an oscillator is stabilized? Deduce the expression for the gain of an internal amplifier to use it in case of the Wein bridge oscillator.

Group-B (Practical)

(Answer any one of the following)

Write down the theory or working formula, Circuit diagram and procedure of the any one of the following experiments:

1. To study V-I characteristics of PN junction diode, and Light emitting diode.
2. To study the V-I characteristics of a Zener diode and its use as voltage regulator.
3. To study the characteristics of a Bipolar Junction Transistor in CE configuration.
4. To study the frequency response of voltage gain of a RC-coupled transistor amplifier.
5. To design inverting amplifier using Op-amp (741,351) and study its frequency response
6. To investigate the use of an op-amp as a Differentiator.

Answer script submitted to rbiswas.pkc@gmail.com