

BE Semester- IV ___ (Instrumentation & Control) Question Bank

(Advance Electronics)

All questions carry equal marks(10 marks)

Q.1	What is an op-amp? Explain block diagram representation of a typical op-amp.
Q.2	Write the characteristics of an ideal op-amp and draw the equivalent circuit of an op-amp.
Q.3	List and explain the open-loop op-amp configurations.
Q.4	For voltage series feedback obtain the expression for input resistance R_{if} .
Q.5	Explain the basic block diagram of feedback amplifier. Also, list steps to recognize the type of topology of given feedback amplifier.
Q.6	What is the effect of feedback connection on input and output impedance for voltage series connections. Explain with derivations.
Q.7	What is thermal drift? How does it affect the performance of an op-amp circuit?
Q.8	Define common-mode rejection ratio (CMRR) and explain the significance of a relatively large value of CMRR.
Q.9	Why is it necessary to use an external offset voltage-compensating network with practical op-amp circuits?
Q.10	What is frequency response? Briefly explain the need for compensating networks in op-amps.
Q.11	Explain different applications of astable multivibrator using 555 timer.
Q.12	Design a circuit for the monostable multivibrator using op-amp.
Q.13	Explain voltage follower circuit in detail with circuit diagram and derivations.
Q.14	Explain current to voltage converter in detail with circuit diagram and derivations.
Q.15	Explain differential amplifier circuit in detail with circuit diagram and derivations.
Q.16	Explain the working of a 3 op-amp instrumentation amplifier with the help of a neat diagram.
Q.17	Explain the operation of an op-amp as i) adder ii) subtractor.
Q.18	Explain integrator in detail with circuit diagram and derivations. Also give its application

Q.19	Explain differentiator circuit in detail with circuit diagram and derivations. Also give its application
Q.20	Explain inverting averaging amplifier circuit in detail with circuit diagram and derivations.
Q.21	Explain peaking amplifier circuit in detail with circuit diagram and derivations.
Q.22	Explain voltage to current circuit in detail with circuit diagram and derivations.
Q.23	Draw the circuit diagram of a non-inverting Schmitt trigger and explain its operation with the help of hysteresis curve.
Q.24	Define a filter. Explain in details classification of filters.
Q.25	With the neat circuit diagram explain the working of Wien bridge oscillator.
Q.26	With the neat circuit diagram explain the working of phase shift oscillator.
Q.27	With the neat circuit diagram explain the working of square wave generator.
Q.28	With the neat circuit diagram explain the working of triangular wave generator.
Q.29	With the neat circuit diagram explain the working of voltage controlled oscillator.
Q.30	With the neat circuit diagram explain the working of Saw tooth wave generator.
Q.31	Draw the schematic diagram for second order low pass Butterworth filter and explain it.
Q.32	Explain the working of a sample and hold circuit using op-amp.
Q.33	What is an all pass filter. Where and why it is needed.
Q.34	Explain active and passive filter. Also give its applications.
Q.35	Explain zero crossing detector circuit in detail with circuit diagram
Q.36	What is an absolute-value output circuit? How it can be used as a full-wave rectifier?
Q.37	What is comparator? What is the difference between a basic comparator and the Schmitt trigger?
Q.38	Explain the difference between the DC and AC amplifiers
Q.39	What is voltage regulator? List four different types of voltage regulators.
Q.40	What is switching regulator? List four major components of the switching regulator.