

Bajaj College of Science, Wardha

Practice Sheet during Lockdown

B.Sc. SEM IV

Subject: Electronics

UNIT I: Long Answer Type Questions

1. Explain the working of Colpitts oscillator in details.
2. Explain NOT gate based crystal oscillator with the help of neat diagram.
3. State and derive Barkhausen criteria for oscillations.
4. Explain working of phase-shift oscillator using OP-AMP.
5. In a phase shift oscillator, the three RC sections are made up of $R = 1K$ ohm and $C = 0.1$ micro farad. Calculate the frequency of oscillation at the output.
6. Explain the equivalent circuit of a Piezoelectric crystal. With a neat circuit diagram, explain the construction and working of NOT gate based crystal oscillator.
7. What is a feedback? Explain positive and negative feedback. Give their applications.
8. Classify the different types of oscillators.
9. With a neat diagram and explain Wien bridge oscillator.
10. List various types of oscillators. Explain the basic oscillator action of a LC tank circuit.

Short Answer Type Questions

1. State any two factors affecting the stability of output frequency of an oscillator.
2. Draw the circuit symbol of an oscillator.
3. Give the formula for frequency of oscillation in Wein Bridge oscillator.
4. What is stability in oscillator ?
5. Give two examples of piezoelectric crystals used in a crystal oscillator.
6. State any two advantages of an Instrumentation Amplifier.
7. Give the formula for Phase shift oscillator.
8. Give the examples of LC oscillator.
9. What is Barkhausen criterion for oscillation.
10. Draw the electrical equivalent circuit for a crystal oscillator.

Stay at Home and Stay Safe!

UNIT II: Long Answer Type Questions

1. Draw the circuit diagram of astable multivibrator using OPAMP. Explain its working with the help of waveforms.
2. Calculate the frequency of output of an astable multivibrator having $R_1 = 35 \text{ kohm}$, $R_2 = 30 \text{ kohm}$, $R = 50 \text{ kohm}$, $C = 0.01 \text{ microfarad}$.
3. What is the need of Sample and Hold Circuit in electronic instrumentation? Explain any one type of S/H circuit.
4. Explain construction and working of an Instrumentation amplifier with three OP-AMPs
5. Draw a neat diagram of OPAMP as Astable multivibrator and explain its working.
6. Explain the concept and need for sample and hold circuit.
7. Draw a neat circuit diagram of OPAMP as monostable multivibrator and explain its working.
8. Draw a neat circuit diagram of OPAMP as astable multivibrator and explain its working.
9. Explain the concept and working of Instrumentation amplifier.
10. Explain the working of sample and hold circuit.

Short Answer Type Questions

1. Why are LC oscillators used at high frequencies only ?
2. State the type of feedback used in a monostable multivibrator.
3. Why do we use CMOS switches in a S/H circuit ?
4. State any two applications of Data Acquisition System.
5. What is Monostable multivibrator ?
6. State the use of instrumentation amplifier.
7. State the application of astable multivibrator.
8. State one application of monostable multivibrator.
9. Give two examples of piezoelectric crystals used in a crystal oscillator.
10. What is astable oscillator?

UNIT III: Long Answer Type Questions

1. Explain the need of D/A converter. Explain weighted resistor type D/A converter with neat circuit diagram.

Stay at Home and Stay Safe!

2. State advantages and disadvantages of weighted resistor type D/A converter.
3. State and explain Sampling Theorem.
4. With a neat circuit diagram, explain the construction and working of 3-bit flash type ADC
5. Explain the Algorithm of a successive approximation ADC. Draw the block diagram of a successive approximation ADC and explain its working.
6. Draw the block diagram of Dual slope A/D converter and explain its working.
7. State and explain the working of flash type ADC with suitable diagram.
What is oscillator ?
8. Explain the working of R-2R ladder type D/A converter with suitable diagram.
9. Explain the working of single slope type A/D converter with suitable diagram.
10. Explain the working of weighted resistor type D/A converter with suitable diagram.
11. Explain the principle of successive approximation A/D converter.
12. Draw the block diagram of counter type A/D converter and explain it.

Short Answer Type Questions

1. What is the need of DAC in electronic instrumentation system ?
2. State the principle of Dual bias DAC.
3. Why is it useful to connect an OP-AMP at the output of a DAC ?
4. State two disadvantages of a single slope ADC.
5. Define settling time.
6. State any two applications of DAC.
7. What is the need of ADC ?
8. State two advantages of successive approximation type ADC.
9. State what is sampling theorem ?
10. What is resolution of D/A converter?

UNIT IV: Long Answer Type Questions

11. Explain various characteristics of electronic instrumentation system.

Stay at Home and Stay Safe!

12. Explain digital instrumentation system with the help of neat block diagram. State its advantages.
13. Explain i) Virtual and ii) PC based instrumentation system.
14. Explain i) analogue and ii) Digital instrumentation system.
15. Explain i) Real ii) Dedicated and iii) Versatile instrumentation system.
16. Explain i) analogue and ii) Digital instrumentation system.
17. Draw and explain block diagram of virtual instrumentation system
18. Explain various calibration standards.
19. Explain static and dynamic system characteristics of the instruments.
20. Explain any four types of instrumentation system.

Short Answer Type Questions

1. What is meant by calibration of instrument?
2. What is dedicated system?
3. Define standalone system.
4. What is virtual instrumentation system?
5. State the significance of virtual instrumentation system.
6. What are the advantages of virtual instrumentation system?
7. Define data acquisition system.
8. What is the function of interface bus?
9. What are deadzone characteristics of instrument?
10. What is meant by sensitivity of instrument?

UNIT V: Long Answer Type Questions

1. What is transducer? Give the classification of transducer and explain any six characteristics of transducer.
2. Differentiate between active and passive transducers. Draw and explain characteristics of NTC type thermistor.
3. Explain static and dynamic performance characteristics of a transducer.
4. Explain i) Sensor ii) Actuator and iii) Transducer with suitable example.
5. Explain construction and working of phototransistor.
6. Explain the operation piezoelectric transducer.
7. Explain how thermistor can be used in temperature measurement. Draw its block diagram and explain.

8. Draw the block diagram of temperature measurement system using LM35 IC and explain it.
9. Explain the measurement of temperature using thermistor by Wheatstone bridge method.
10. Draw the block diagram of colorimeter using LDR and explain it.
11. Explain the principle of operation of insect repellent using piezobuzzer.

Short Answer Type Questions

1. Define piezoelectric transducer.
2. State any two uses of pressure transducer.
3. Define sensor and actuator.
4. State the difference between sensor and actuator.
5. State any two characteristics of a sensor.
6. State the applications of photo transistor.
7. Draw V-I characteristics of photo transistor.
8. State the disadvantages of using thermistor in temperature measurement system.
9. Why base terminal is open (not connected) in phototransistor.
10. State the applications of colorimeter.
11. List the features of LM35.
12. Draw a pin diagram of LM35.
13. State the principle of operation of electronic insect repellent.

UNIT VI: Long Answer Type Questions

1. Explain the different characteristics of a biomedical instrumentation system.
2. Draw a block diagram of ECG and explain it.
3. Write a note on safety codes in biomedical instruments.
4. Explain Man-Instrument system and its components.
5. Draw the block diagram of EMG and explain it.
6. Discuss the problems encountered during measurement of living system.
7. Explain basic recording system.
8. List different types of brain waves and explain it.
9. Explain various types of leakage currents in biomedical instrumentation system.

Stay at Home and Stay Safe!

10. Explain the methods of accident prevention in a hospital.

Short Answer Type Questions

1. What is the full form of EEG?
2. What are electrical shock hazards?
3. What are the advantages of using biomedical instruments?
4. State any two objective of bio medical instrumentation system.
5. State any one method of preventing accident in biomedical instruments.
6. What is bioelectric potential?
7. Sketch the standard waveform of ECG.
8. State the uses of EMG.
9. Define artifact.
10. State various types of leakage currents in biomedical instrumentation system.