



KERALA AGRICULTURAL UNIVERSITY
B. Tech. (Agrl. Engg.) 2022 & Previous Admissions
IV Semester Final Examination – July 2024

Sacs.2213

Applied Electronics and Instrumentation (2+1)

Marks: 50
Time: 2 hours

- I Fill in the blanks** **(10x1=10)**
1. Semiconductors are materials with conductivity compared to conductors but higher than insulators.
 2. In a transistor series voltage regulator, the transistor acts as a to control the output voltage.
 3. A circuit shifts the DC level of a waveform by adding a DC bias voltage.
 4. A subtractor circuit performs binary subtraction, typically involving complement arithmetic.
 5. A is a device that converts a physical quantity into an electrical signal.
- State True or False**
6. A P-N junction diode conducts current easily in both directions.
 7. A Wein bridge oscillator is a type of digital logic circuit.
 8. A full-adder has two inputs and two outputs.
 9. A voltage regulator using an op-amp can maintain a stable output voltage even if the input voltage fluctuates.
 10. In a pressure measurement system, Bourdon tubes are used for high-pressure measurements.
- II Write short notes on ANY FIVE of the following** **(5x2=10)**
1. What is doping?
 2. What is a rectifier and list its types?
 3. Define a Zener diode voltage regulator and state its primary function.
 4. Describe the role of filter circuits in electronic systems.
 5. What are the ideal characteristics of an operational amplifier?
 6. Define the function of an integrator circuit using an OP-AMP.
 7. Differentiate between a sensor and a transducer.
- III Answer ANY FIVE of the following** **(5x4=20)**
1. Explain the advantages, disadvantages, and diverse applications of PN junction diodes in modern electronic circuits
 2. Compare the clipper and clamper circuits in terms of their functions, operating principles, and applications.
 3. A Hartley oscillator is designed with $L_1 = 2\text{mH}$, $L_2 = 20\mu\text{H}$ and a variable capacitance. Find the range of capacitance value if the frequency of oscillation is varied between 950 to 2050 kHz
 4. What is Half Adder? Explain the truth table and logical expression of Half Adder.
 5. Discuss the working of a differentiator using OP-AMP.
 6. Describe the construction, working, and applications of a strain gauge.
 7. Explain the principle and types of temperature measurement techniques

IV

Write an essay on ANY ONE of the following

(1x10=10)

1. Explain the working of bridge rectifier. Give the Expression for PIV, Ripple factor and efficiency.
2. For the non-inverting op amp shown in figure, find the output voltage (V_o).


