



**KERALA AGRICULTURAL UNIVERSITY**  
**B.Tech.(Agrl. Engg.) 2024 Admission**  
**I Semester Final Examination - March 2025**

FMP 1102

**Basic Electrical Gadgets and Instruments (2+1)**

**Marks:50**  
**Time: 2 hours**

**I**

**Choose the correct answer**

**(10x1=10)**

1. What is the frequency of the AC and DC supply in Indian system?
  - a) 50Hz and 0
  - b) 0 and 50Hz
  - c) 60Hz and 50Hz
  - d) 50Hz and 60Hz
2. When  $X_C = X_L$  in the electric circuit:
  - a) draws maximum current
  - b) applied voltage is zero
  - c) is at resonance
  - d) draws minimum current
3. Which of the following Instrument used for measurement of speed
  - a) Voltmeter
  - b) Lactometer
  - c) Ammeter
  - d) speedometer
4. Which of the following is the main application of Zener Diode?
  - a) Amplifier
  - b) Voltage regulator
  - c) Multivibrator
  - d) Rectifier
5. Which biasing method provides the most stable operating point in a BJT amplifier circuit?
  - a) Fixed bias
  - b) Self bias
  - c) Voltage Divider bias
  - d) Collector to base bias
6. What is the function of Multiplexer?
  - a) It is a type of decoder which decodes several inputs and gives one output
  - b) A multiplexer is a device which converts many input signals into one input
  - c) It takes one input and results into many output
  - d) It is a type of encoder which decodes several inputs and gives one output
7. Electrical strain gauge works on the principle of \_\_\_\_\_
  - a) variation of resistance
  - b) variation of capacitance
  - c) variation of inductance
  - d) variation of area

8. Transducers which requires an external power source for their operation is called .....
- Active Transducers
  - Passive transducers
  - Both Active and Passive Transducers
  - Photovoltaic cell

**Fill in the blanks**

9. In a Delta connection, each phase is connected to a common neutral point. The relationships between line voltage and phase voltage is .....
10. .... is used for the measurement of A.C. as well as D.C. voltage, current and resistance.

**II Write short notes on ANY FIVE of the following (5x2=10)**

- What is the difference between AC power and DC power?
- What are the different electrical appliances used in agricultural buildings, structures and farm operations?
- Write the few combinational logic circuits.
- What is the function of Encoder and Decoder?
- Give the few variable resistance transducers.
- What is the function of pyrometer?
- Give few examples of Active and Passive transducers.

**III Answer ANY FIVE of the following (5x4=20)**

- Discuss the significance of series and parallel circuit.
- How three phase power is measured in Single wattmeter method with necessary diagram?
- Reduce the given Boolean function using K-Map  $Y(A,B,C) = \Sigma (0,1,3,6,7)$
- Discuss the operation of Clamper circuit with necessary circuit and waveforms.
- Draw the symbol and truth table of AND, NAND and NOT logic gates.
- Write the few application of Piezoelectric Transducer, Thermocouple Transducer and Photovoltaic Transducer.
- Write short notes about the instruments used for measurement of solar radiation.

**IV Write an essay on ANY ONE of the following (1x10=10)**

- Discuss the significance of Rectifier and explain any one type of Rectifier with neat circuit and waveform.
  - Draw the Ideal OP-AMP and write its characteristics and explain in detail with neat sketch about the Adder using operational amplifier.
- Write short notes on following transducers with necessary diagram.
  - LVDT
  - Thermistor

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