KERALA AGRICULTURAL UNIVERSITY
B. Tech. (Agrl. Engg.) 2025 & Previous Admissions
I Semester Final Examination – February 2026

FMP 1102 **Basic Electrical Gadgets and Instruments (2+1)** **Marks: 50**
Time: 2 hours

I **Fill in the blanks** **(10x1=10)**

1. The three-phase power can be measured using the …….. and ……….. wattmeter methods.
2. The voltage multiplier circuit is constructed using ………… and capacitors.
3. The ………… is used to measure temperature using temperature-sensitive resistors.

State True or False

4. OP-AMP is used only for linear applications.
5. Boolean algebra helps simplify digital logic expressions.
6. A load cell is used for the measurement of force.

Answer the following

7. Define Q-factor and bandwidth in resonance.
8. What is a combinational logic circuit? Give an example.
9. What is the function of an anemometer?
10. What is a Zener diode

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

1. What is a transducer?
2. A strain gauge has a gauge factor of 2. Calculate the strain if the measured resistance change is $\Delta R=0.1\Omega$ and the initial resistance is $R=100\Omega$.
3. Differentiate between AC and DC supply systems.
4. Describe the principle of operation of an LVDT.
5. Draw the V-I characteristics of a junction diode when it is
   (a) forward biased and
   (b) reverse biased.
6. Draw N-P-N and P-N-P transistors. Why is emitter wider than collector and base?
7. What are the different modes of operation for an OP-AMP?

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

1. List the instruments used to measure temperature and their working principles. Any four
2. Prove the distributive property A(B+C) =AB+AC using a truth table.
3. While performing a load test on a 3-phase wound-rotor induction motor by two wattmeter's method, the readings obtained on two wattmeter's were + 14.2 kW and – 6.1 kW and the line voltage where 440 V. Calculate:
   (i) True power drawn by the motor
   (ii) Power factor
4. A full-wave rectifier uses two diodes, the internal resistance of each diode may be assumed constant at 25Ω. The transformer r.m.s. secondary voltage from centre tap to each end of secondary is 60 V and load resistance is 750Ω. Find:
   (i) The mean load currents
   (ii) The r.m.s. value of load current

5. Write short notes on:
   (a) Combinational logic circuit
   (b) Multiplexer
6. Explain Inverting Amplifier.
7. What is electrical Transducer and its classifications?

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

1. What are the Characteristics of a Transducer? Factors influencing the choice of transducers.
2. What are Logic Gates? Explain AND, OR, NOT, NAND, and NOR logic gate with truth table.

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