KERALA AGRICULTURAL UNIVERSITY
B. Tech. (Food Technology) 2024 Admission
III Semester Final Examination – January 2026

BES 2117 **Basic Electronics Engineering (1+1)** **Marks: 50**
Time: 2 hours

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

1. Addition of pentavalent impurity to a semiconductor creates many .....
2. In a transistor, the base current is about ..... percentage of emitter current.
3. The purpose of capacitors in a transistor amplifier is to .....
4. The input stage of an Op-amp is usually a ..... amplifier.
5. A Zener diode utilizes ..... characteristic for voltage regulation.
6. The inputs of NAND gate are connected together. The resulting circuit is ..... gate.
7. In Boolean theorems, $A + \bar{A} =$ .....
8. Thermocouple is used to find .....
9. Thermistors are widely used in the temperature range of .....
10. The full-scale input voltage to an ADC is 10 V. If the resolution required is 5 mV , the minimum number of bits required for ADC .....

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

1. Define : Base current amplification factor (β)
2. Write about voltage follower using operational amplifier.
3. What is common mode rejection ratio (CMRR) of a differential amplifier?
4. State De Morgan's Theorems.
5. Define resolution in A/D converter.
6. List the self-generating active transducers.
7. Define: Piezoelectric effect.

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

1. Derive an expression for the efficiency for a full wave rectifier.
2. Explain the working of op-amp as a differentiator with neat diagram.
3. What are the different methods of biasing a transistor? Which method is widely used & why?
4. Simplify the following Boolean equation using k-map:
   $Y=\bar{A}BCD + AB\bar{C}\bar{D} + AB\bar{C}D + ABCD + ABC\bar{D} + A\bar{B}\bar{C}D + A\bar{B}CD + \bar{A}B\bar{C}D$
5. With a neat diagram explain R-2R ladder DAC.
6. Describe the working principle of photo electric transducer.
7. Discuss the principle of operation of resistance thermometer.

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

1. Discuss about the load line and operating point in a transistor with necessary diagram.
2. Explain the structure of LVDT and its principle of operation and also list its advantages.

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