E-01 - Electronics Paper-I
(Basic Electronics and Semiconductor Devices)

P. Pages : 2   ‖‖‖‖‖‖‖‖‖‖   **GUG/W/17/3307**

Time : Three Hours   * 1 9 7 1 *   Max. Marks : 50
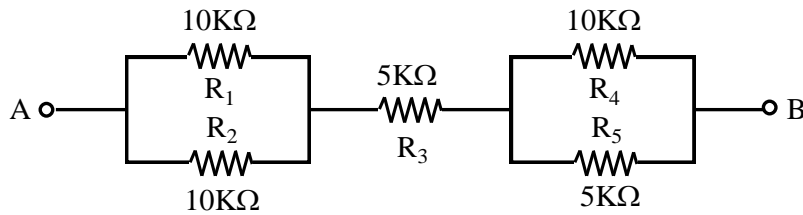
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Notes :   1.   All questions are compulsory and carry equal marks.
          2.   Draw neat diagram wherever necessary.
          3.   Use of log table / calculator is permissible.

1.   **Either**

a)   Explain the construction and working of potentiometer.   **10**
Find the equivalent resistance across terminals A & B.

OR

b)   What is Capacitor ? Describe the basic construction of Electrolyte capacitor.   **10**
Explain the construction and working of transformer.

2.   **Either**

a)   Explain the p-type and n-type semiconductor.   **10**
Draw the forward characteristics of p-n junction diode and explain it.

OR

b)   Explain the avalanche and Zener breakdown mechanism.
What is rectifier ? Explain the working of bridge full wave rectifier. Draw its input and output waveform.

3.   **Either**

a)   Explain the construction and working of NPN transistor.   **10**

Prove $\alpha = \dfrac{\beta}{1+\beta}$ and $\beta = \dfrac{\alpha}{1-\alpha}$

OR

b)   Explain the input and output characteristic of BJT in common emitter configuration with suitable diagram.
What is quiescent point ? Explain the importance of quiescent point.

Either

4. a) Explain the working of N-channel JFET with suitable diagram. Draw the drain characteristic of JFET and explain it. **10**

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OR

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b) Explain the construction and working of SCR. Explain the working of TRIAC and draw its V-I characteristics.

5. a) What is step up and stepdown transformer ? **2½**

b) Explain diode as a halfwave rectifier. **2½**

c) Define α and β. If $\alpha = 0.95$, find β. **2½**

d) Differentiate JFET and BJT. **2½**

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