



GUG/W/15/3307

B.Sc. (With Credits)-Regular-Semester 2012 Sem I  
**E-01 Electronics - I : Paper - I**  
**(Basic Electronics and Semiconductor Devices)**

P. Pages : 4

Time : Three Hours

Max. Marks : 50

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- Notes :
1. All questions are compulsory and carry equal marks.
  2. Draw labelled diagrams wherever necessary.
  3. Use of log table / calculator is permissible.

**1.** Either :

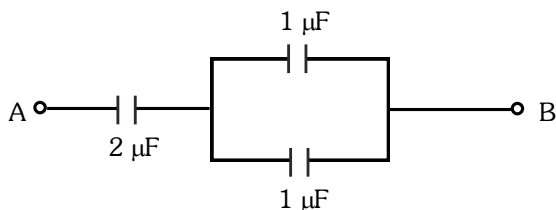
- a) State different types of resistors and explain any two of them. **6**  
**+4**  
State whether the following resistors are carbon composition or wire wound type.
- i)  $R_1$  is  $100K\Omega$  with  $\frac{1}{2}$  W power rating.
  - ii)  $R_2$  is  $1K\Omega$  with 10 W power rating.

**OR**

- b) Explain the construction of an electrolytic capacitor and state the precautions while connecting it in the circuit. **5**  
**+3**  
**+2**

Explain with diagram the construction of step up and step down transformer.

Determine equivalent capacitance across terminal A and B.



**2.** Either :

- a) Explain the concept of energy band. **5**  
What is meant by intrinsic and extrinsic semiconductor? **+5**

Explain the working of PN junction in forward and reverse bias mode with its characteristics.

**OR**

- b) What is a rectifier? Explain the working of bridge rectifier. Draw its input and output waveforms. State different breakdown mechanisms and explain any one. **5**  
**+5**

**3.** Either :

- a) Draw the symbol of PNP and NPN transistor. Draw input and output characteristics of NPN transistor in CE mode and explain how input and output impedances are calculated. A transistor has  $\beta = 100$  and  $I_B = 50\mu A$ . Calculate the value of  $\alpha$ ,  $I_C$  and  $I_E$ . **7**  
**+3**

**OR**

- b) Draw the circuit diagram for transistor amplifier in CE mode and explain its working. Give the phase relationship in input and output signals. What is load line? Explain the construction of DC load line in CE amplifier. **7**  
**+3**

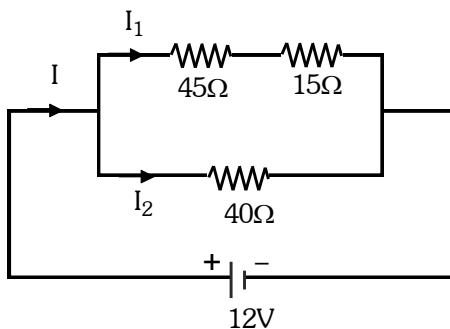
**4.** Either :

- a) Differentiate between UJT and BJT. Explain the construction and operation of a UJT. Define the term intrinsic stand off ratio. State two applications of UJT. **10**

**OR**

b) What is MOSFET? State different types of MOSFETS. Give their symbols. Explain the construction and working of P-channel enhancement type MOSFET. **10**

5. a) Find total current  $I$  flowing in the given circuit. **2½**



b) Explain diffusion and transition capacitance of PN junction diode. **2½**

c) Explain the leakage currents in transistor. **2½**

d) What is SCR?  
Give its structure and circuit symbol. **2½**

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