

Roll No.

Total Pages : 03

BT-3/D-20

43157

ELECTRONICS FUNDAMENTALS

ES-201A

Time : Three Hours]

[Maximum Marks : 75

Note : All questions in Part A and Part B are compulsory.
Attempt any *Four* questions from Part C selecting at
least *one* question from each Unit.

Part A

1. Answer the following :
 - (i) Define half wave rectifier.
 - (ii) Define load line and operating point of a transistor.
 - (iii) Define Barkhausen criteria for oscillation.
 - (iv) Define Sensitivity and Accuracy.
 - (v) List characteristics of good transducer. **15**

Part B

2. Discuss the principle of Avalanche breakdown and of zener diode. **5**
3. Discuss the working of npn transistor as switch. **5**
4. Discuss the working of Phase Shift Oscillator. **5**

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5. Discuss the selection criteria of transducer for measurement. 5

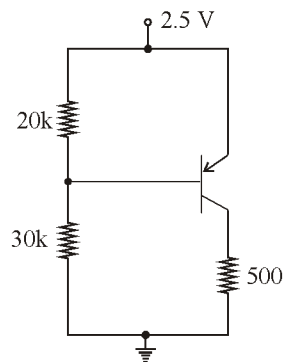
Part C

Unit I

6. Discuss the working of full-wave rectifier and derive expression for its efficiency. 10
7. A crystal diode having internal resistance $r_f = 20\Omega$ is used for half-wave rectification. If the applied voltage $v = 50 \sin \omega t$ and load resistance $R_L = 800 \Omega$, find : (i) I_m , I_{dc} , I_{rms} , (ii) a.c. power input and d.c. power output, (iii) d.c. output voltage and (iv) efficiency of rectification. 10

Unit II

8. Discuss Common Emitter Configuration of an npn transistor. Calculate its V_{CE} and I_b expressions. 10
9. Find the bias point of the transistor (Si BJTs with $\beta = 100$ and $V_A \rightarrow \infty$). 10



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Unit III

10. Discuss the working principle of Wein Bridge oscillator. **10**
11. A 3-stage RC Phase Shift Oscillator is required to produce an oscillation frequency of 6.5 kHz. If 1nF capacitors are used in the feedback circuit, calculate the value of the frequency determining resistors and the value of the feedback resistor required to sustain oscillations. Also draw the circuit. **10**

Unit IV

12. Discuss the construction and working of Thermocouple. **10**
13. Define Digital DAC and its working principle and define various types of errors in measuring system. **10**