SECTION C

7. What is Barkhausen criterion? What do you mean by frequency stability and stability criterion in an oscillator? Explain the Wein Bridge oscillator in detail. 12

8. (a) Explain the working of Hartley oscillator and derive the expression for its frequency of operation. 6

   (b) Why do we need stabilization and biasing? Explain in detail. 6

9. Explain the working of Colpitt's oscillator and phase shift oscillator with neat diagram. 12

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(b) What do you mean by diffusion length? Prove electric field in n-type semiconductor is

$$E = \frac{1}{A_{qn}\mu_n}\left(\frac{D_n}{D_p} - 1\right) I_P.$$ 6

SECTION B

4. Write short notes on any *two* :

(a) Miller Theorem

(b) Hybrid-pi CE transistor model

(c) Ebers-Moll model. 12

5 (a) A common transistor amplifier uses voltage source of internal resistance R_S = 200 Ω and the load resistance is R_L = 1200 Ω. The h-parameters are h_{ib} = 24 Ω, $h_{rb} = 4\times10^{-4}$, $h_{fb} = -0.98$ and $h_{ob} = 0.6$ μA/V. Calculate the current gain, input impedance, voltage gain and output admittance. 6

(b) Give difference between :

(i) CB, CE and CC configuration

(ii) Zener and avalanche breakdown. 6

6. Draw h-parameter equivalent circuit of a loaded amplifier in CE-configuration and derive the expression for current gain, voltage gain, input impedance, output impedance, overall voltage and power gain. 12

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B.Tech. (FOURTH SEMESTER) EXAMINATION, 2019

(EIE / EEE / BT / CHE)

ENGG 202— Basic Electronics

TIME ALLOWED : THREE HOURS

Maximum Marks— 60

Attempt five questions in all, selecting not more than two questions from each Section.
All questions carry equal marks.

SECTION A

1. (a) What are semi conductors? What are its types? Explain in detail. 6

   (b) Explain Volt-Amp characteristics with proper diagram. 6

2. (a) Write short note on active and passive components. 6

   (b) Draw and explain *VI* characteristics of Germanium diode. 6

3. (a) Calculate the value of I_C, I_E and β_{dc} for a transistor with α_{dc} = 0.98 and I_B = 120 μA.6

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