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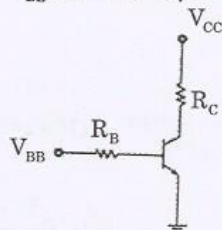
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PART - B

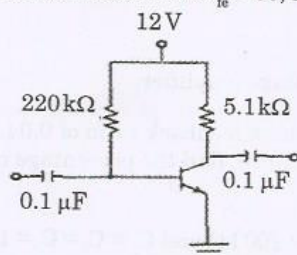
(5×13=65 Marks)

11. a) i) Explain the V-I characteristics of zener diode. (8)
 ii) Show that zener diode can be used as a voltage regulator. (5)
 (OR)
- b) i) Explain the V-I characteristics of PN junction diode. (8)
 ii) With a neat diagram explain the working of full wave rectifier circuit realized using PN junction diode. (5)
12. a) i) Explain the input and output characteristics of a BJT in CB configuration. (7)
 ii) Determine the base, collector and emitter currents and V_{CE} for a CE circuit shown below. For $V_{CC} = 10\text{ V}$, $V_{BB} = 4\text{ V}$, $R_B = 200\text{ k}\Omega$, $R_C = 2\text{ k}\Omega$, $V_{BE(on)} = 0.7\text{ V}$, $\beta = 200$. (6)



(OR)

- b) i) Describe the working principle of SCR with V-I characteristics. (7)
 ii) Draw the equivalent circuit of UJT and explain its input characteristics. (6)
13. a) i) Draw the circuit diagram of a CE amplifier and explain its working. (8)
 ii) Determine the input impedance, output impedance, voltage gain and current gain for the CE amplifier of the figure shown below. The h-parameters of the transistor are $h_{re} = 60$, $h_{ie} = 500\ \Omega$ at $I_C = 3\text{ mA}$. (5)



(OR)



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- b) i) Draw the small signal model of FET amplifier in CS connection and derive the equations for voltage gain, input impedance and output impedance. (8)
- ii) A BJT has $g_m = 38 \text{ mmhos}$, $r_{b'e} = 5.9 \text{ k}\Omega$, $h_{ie} = 6 \text{ k}\Omega$, $r_{bb'} = 100 \Omega$, $C_{b'c} = 12 \text{ pF}$, $C_{b'e} = 63 \text{ pF}$ and $h_{fe} = 224$ at 1 kHz. Calculate α and β cut off frequencies and f_T . (5)
14. a) What is neutralization ? Explain the hazeltine neutralization method. (13)
- (OR)
- b) Draw the equivalent circuit of capacitance coupled single tuned amplifier and derive the equation for voltage gain. (13)
15. a) What are the different types of negative feedbacks ? Explain the types with neat block diagram. (13)
- (OR)
- b) Explain the working of Hartley and Wien bridge oscillator. (13)

PART - C

(1×15=15 Marks)

16. a) i) In the biasing with feedback resistor method, a silicon transistor with feedback resistor is used. The operating point is at 7 V, 1 mA and $V_{CC} = 12 \text{ V}$. Assume $\beta = 100$. Determine the value of R_B , stability factor and what will be the new operating point if $\beta = 50$ with all other circuit values are same ? (8)
- ii) In a colpitts oscillator the values of the inductors and capacitors in the tank circuit are $L = 40 \text{ mH}$, $C_1 = 100 \text{ pF}$ and $C_2 = 500 \text{ pF}$.
- i) Find the frequency of oscillations.
- ii) If the output voltage is 10 V find the feedback voltage.
- iii) Find the minimum gains if the frequency is changed by changing L alone.
- iv) Find the value of C1 for a gain of 10 and
- v) Find the new frequency. (7)

(OR)