Notes: If not mentioned, then you can ignore I$_B$ in problem solving.
If not mentioned, use first approximation for diodes.
Assumptions made should be written clearly.

Q.1:   Draw the output waveform of following 3 circuits Consider a sine wave of amplitude 5V as input and plot the output waveform for 2 cycles. Consider Ideal diodes for all 3 figures.   [3 + 3+ 4]

Q.2:   Analyze the circuit given in figure 4 and find out IC, VE, VCC, VCE and R1.   [5]

Q.3:   Analyze the circuit given in figure 5 and find out the value of 3dB Bandwidth of Amplifier. Consider β = 100, CBC = CBE = 10pF.   [10]

Q.4:   Design a Wein Bridge Oscillator. What is the value of attenuating and amplifying factors in this oscillator?   [5]

Q.5:   Design a pulse width modulator using NE555. If R = 2kΩ, C = 5nF and VCC = 12V then find out the minimum and maximum width that can be produced by this modulator. Also write down a suitable frequency of the triggering pulse.   [5]

Q.6:   Analyze the circuit given in figure 6 and find out the value of Vout, Iout and power dissipated in the circuit.   [5]

Q.7:   For a 6 bit Flash ADC with Vref = 5V, find the thermometer code for input voltages 1.621 and 3.778V. Also find the corresponding Binary codes.

Q.8:   Design a 3 bit R-2r Ladder DAC circuit.   [3+2]

Q.9:   Design electronics TOSS circuit. The circuit should show output in the form of a glowing LED, either Red or Green. Once a switch, named 'TOSS' is pressed and then released after sometime then only one of the LED should remain on and other should be off.   [5]