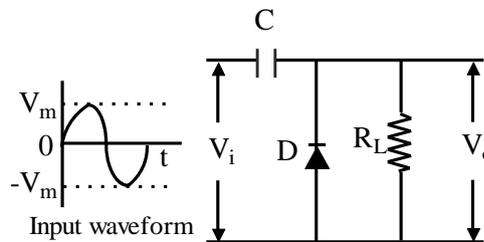




- Notes :
1. All questions carry marks as indicated.
 2. Assume suitable data wherever necessary.
 3. Illustrate your answers wherever necessary with the help of neat sketches.

1. a) Identify the following circuit shown in fig. Draw the input and output waveform and explain its operation. 8



- b) Explain the significance of all components of small signal low frequency hybrid π model with its circuit diagram. 8

OR

2. a) Define clipper and clamper circuit. Explain the operation of positive clipper circuit with its input and output waveform. 8

- b) Draw the hybrid equivalent h model of transistor and derive all the h parameters of transistor. 8

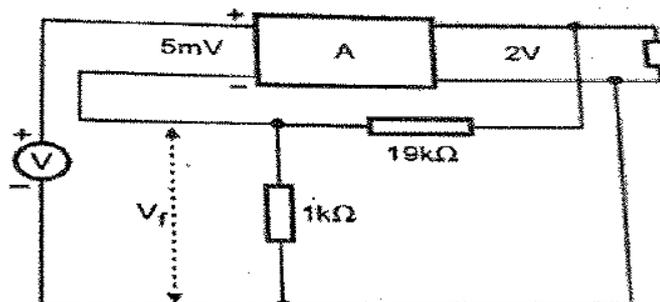
3. a) With neat diagram explain Push Pull Class B Power Amplifier and derive its maximum efficiency. 8

- b) What is negative feedback amplifier? Derive the gain formula for negative feedback amplifier. 8

OR

4. a) A feedback amplifier is shown in the following fig. Calculate 8

- 1) The value of feedback factor β .
- 2) Voltage gain of amplifier without feedback.
- 3) Voltage gain of amplifier with feedback.
- 4) The feedback voltage (V_f)



- b) Compare positive feedback and negative feedback. 4
- c) Compare class A, class B, class AB and class C power amplifier. 4
- 5. a) Design an astable multivibrator to provide a train of pulse $2\mu\text{s}$ wide at a repetition rate of 100 KHz if $R_1 = R_2 = 20\text{K}\Omega$. 8
- b) Explain the operation of a transistorized wien bridge oscillator with the help of neat circuit diagram and its frequency formula. 8

OR

- 6. a) With the help of circuit diagram and waveform explain the operation of UJT relaxation oscillator. 8
- b) A colpitts oscillator is designed with $C_1 = 100\text{pF}$ and $C_2 = 7500\text{pF}$. The inductance is variable. Determine the range of inductance values, if the frequency of oscillation is to vary between 950kHz to 2050kHz. 8
- 7. a) Draw the circuit diagram of emitter coupled dual input balance output differential amplifier and obtain its a. c. analysis. 8
- b) What is CMRR? Explain current mirror method of improving CMRR. 8

OR

- 8. a) Define:- 8
 - 1) Input bias current. 2) Input offset current.
 - 3) Input offset voltage. 4) Output offset voltage.
- b) For a typical IC 741 op-amp, the parameters are given as $I_{CQ} = 10\mu\text{A}$ and capacitance $C = 33\text{pF}$. The peak value of the input voltage is 12V. Determine the slew rate and maximum possible frequency of the input voltage that can be applied to get undistorted output. 4
- c) Draw the symbol and pin diagram of op-amp IC-741. State the ideal characteristics of op-amp. 4
- 9. a) Show that the output of the subtractor is proportional to the difference between the two input voltages. 8
- b) What is active differentiator circuit? With neat circuit diagram and waveform explain the working of an active differentiator circuit. 8

OR

- 10. a) Implement the given equation using op-amp 8

$$V_0 = 3V_1 + 5V_2 + 10V_3 - 2V_4$$
- b) With the help of neat diagram and waveform, explain the full wave precision rectifier circuit. 8
