

Three Hours

80 Marks

- N.B.
- 1) Question-1 is compulsory.
 - 2) Solve any **Three** questions from the remaining.
 - 3) Assume suitable data wherever necessary.
 - 4) All questions carry equal marks.

Q.1 Solve any **four** of the following: **20**

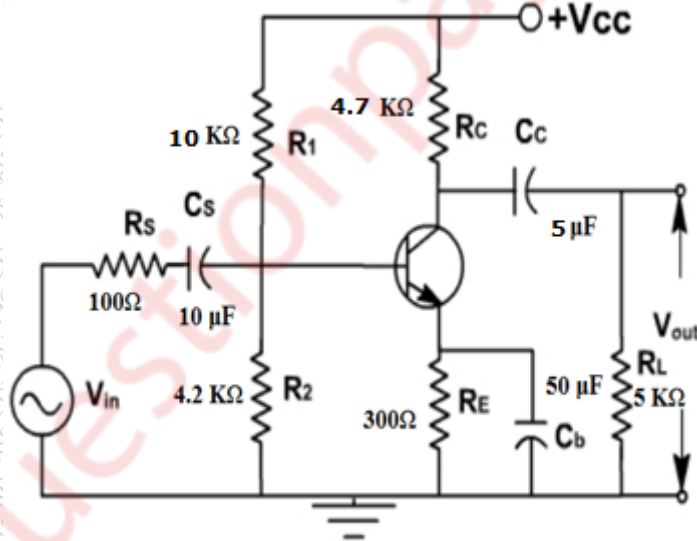
- a) Explain cross over distortion in Class B power amplifier.
- b) Explain Darlington pair amplifier.
- c) Explain Gunn diode.
- d) Explain high frequency equivalent circuit of MOSFET.
- e) Draw MOSFET differential amplifier with active load.

Q.2 a) Explain working of TRIAC with construction and V-I characteristics. Also give its applications. **10**

b) Explain voltage series and current shunt feedback amplifiers. **10**

Q.3 a) Calculate lower cut off frequency of the following circuit. **10**

$\beta=100, r_{\pi}=1.5K\Omega, g_{m2}=50\mu A/V, C_{\pi}=15pF, C_{\mu}=1pF$



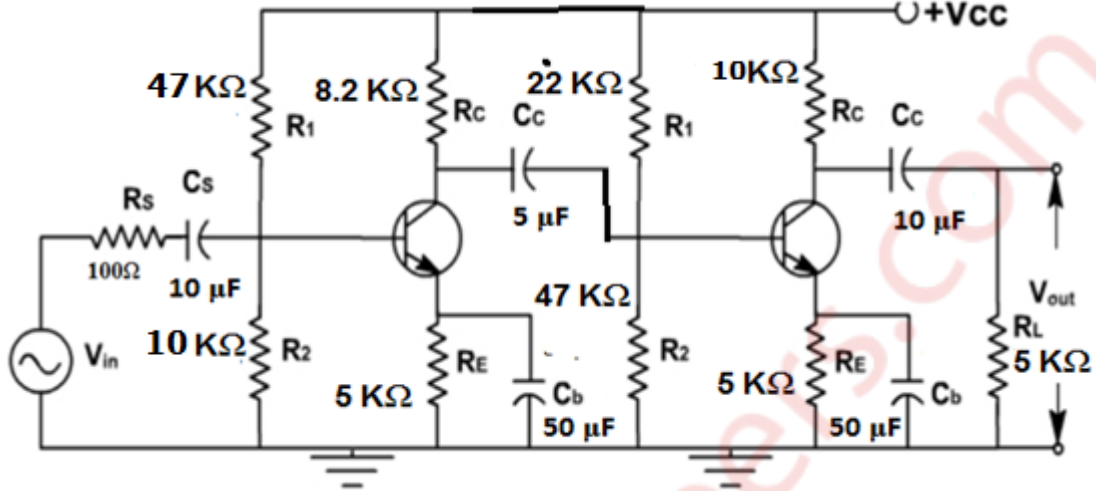
b) Explain UJT as a relaxation oscillator with neat circuit diagram. **10**

Q.4 a) Explain Class A power amplifier with circuit diagram and derive equation for efficiency. **10**

b) Explain small signal analysis for MOSFET active load circuit. **10**

Q.5 a) Calculate bandwidth for two stages RC coupled CE amplifier shown in the circuit below: **10**

$\beta_1 = \beta_2 = 100$, $r_{\pi 1} = r_{\pi 2} = 1.5 \text{ K}\Omega$, $g_{m1} = g_{m2} = 50 \text{ mA/V}$
 $C_{\pi 1} = C_{\pi 2} = 10 \text{ pF}$, $C_{\mu 1} = C_{\mu 2} = 5 \text{ pF}$



b) Explain Hartley oscillator. Design the same for 5MHz. **10**

Q.6 Write short notes on any **three** of the following: **20**

- a) SCR
- b) Wein bridge oscillator.
- c) Cascode BJT amplifier
- d) Class B push pull power amplifier
