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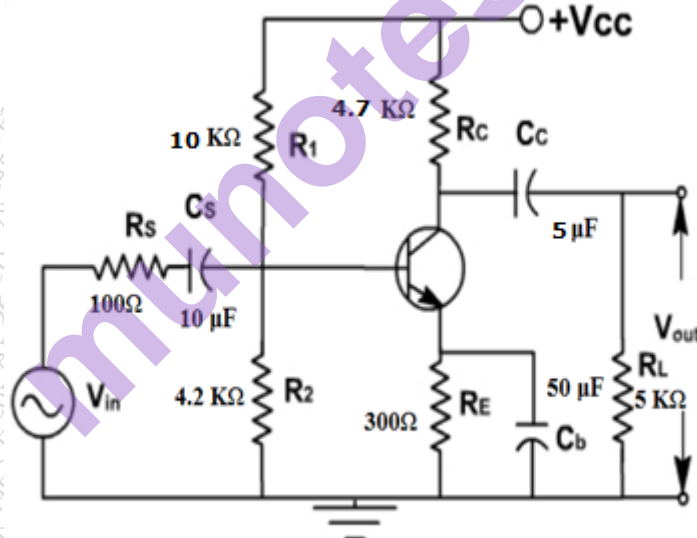   b) Explain voltage series and current shunt feedback amplifiers.
                                                                                                                        10

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

           β=100, r_π=1.5KΩ, g_{m2}=50μA/V, C_π=15pF, C_μ=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
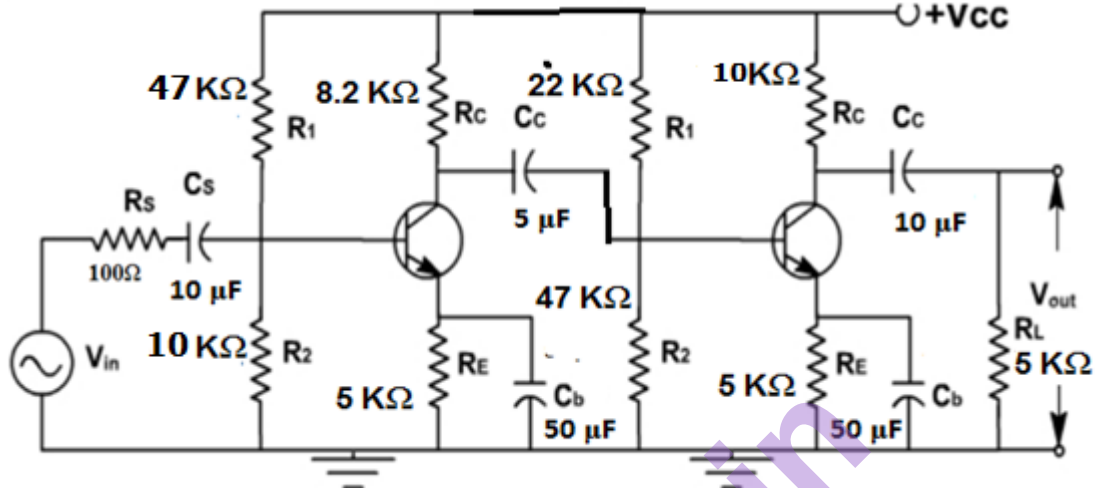   for efficiency.   **10**
           b) Explain small signal analysis for MOSFET active load circuit.   **10**

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

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

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

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