

SE / III / INST / A-E / CBGS / 30.05.16

Analog Electronics

QP Code : 30705



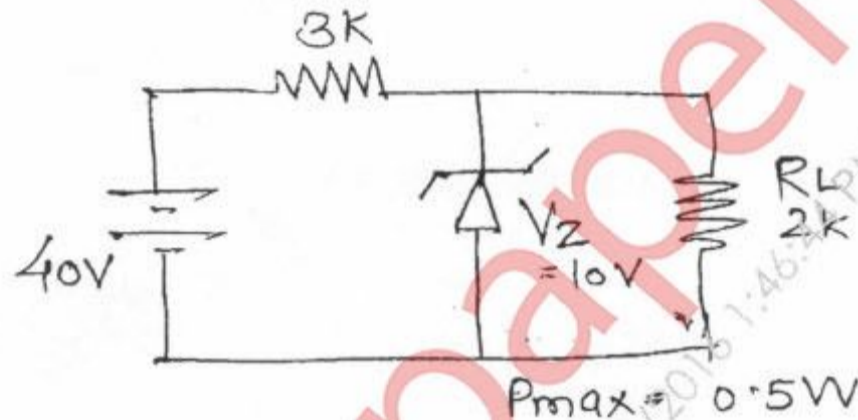
(3 Hours)

[Total Marks : 80

- N.B. : (1) Question No. 1 is compulsory.
(2) Attempt any **three** questions from remaining **five** questions.
(3) **Figures** to the **right** indicate **full** marks.
(4) Assume **suitable** data if **necessary**.

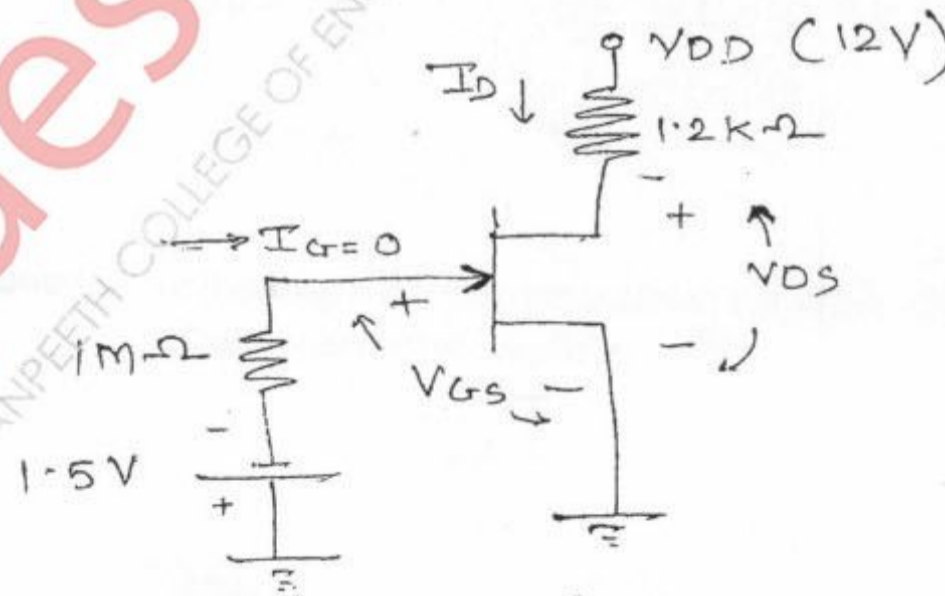
1. Attempt any **four** questions from the following :-

- (a) Derive the stability factor $S(I_{CO})$ for fixed bias circuit.
(b) Calculate battery current I_1 , I_2 and I_L in circuit



- (c) How FET be employed as a voltage controlled resistor ?
(d) Explain OP-AMP as summing amplifier averaging amplifier.
(e) What are the ideal op-Amp characteristics?
(f) Define and explain harmonic distortion'.

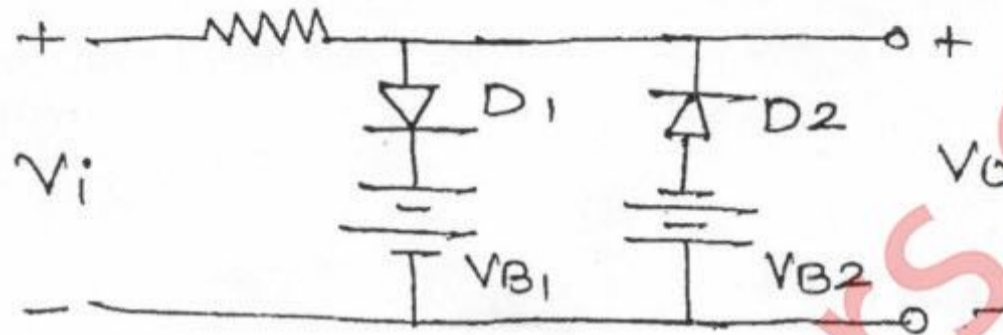
2. (a) Determine I_{DQ} and V_{DSQ} for following fixed bias configuration. It is given that $I_{DSS} = 12\text{mA}$ and $V_p = -4\text{V}$



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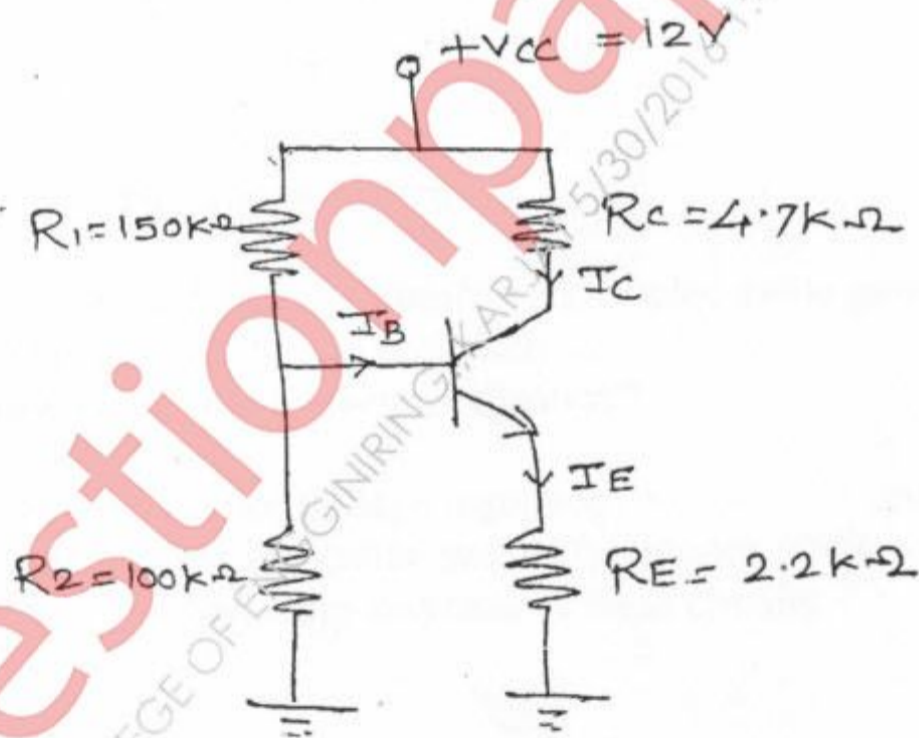
FW-Con. 11490-16.

- (b) Determine Output voltage. Assume, $V_{B1} = 8V$, $V_{B2} = 6V$ and input to be sine wave of 20V peak. 5



- (c) Explain Low pass filter. 5

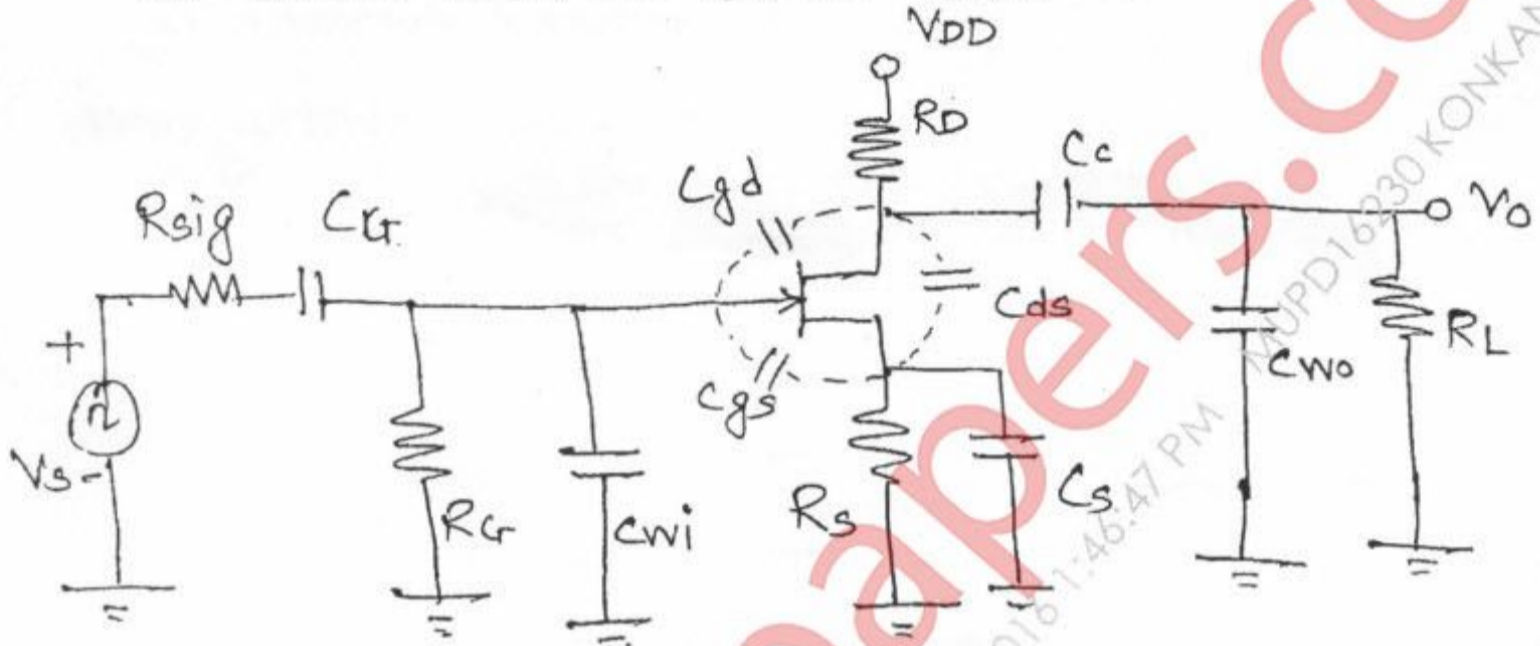
3. (a) For the circuit shown find the operating point co-ordinates. Given that $\beta = 50$, $V_{BE} = 0.7V$ 10



- (b) Derive equation for three op Amp Instrumentation amplifier. Give advantages and application of Instrumentation amplifier. 10

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4. (a) Determine the higher cut off frequencies for the given circuit diagram. 10
 Given $C_G = 0.01\mu\text{F}$, $C_C = 0.5\mu\text{F}$, $C_S = 2\mu\text{F}$, $R_{\text{SIG}} = 10\text{K}$, $R_G = 1\text{M}$, $R_D = 4.7\text{K}$,
 $R_S = 1\text{K}$, $R_L = 2.2\text{K}$, $I_{\text{DSS}} = 8\text{mA}$, $V_p = -4\text{V}$, $r_d = \infty$, $V_{\text{DD}} = 20\text{V}$, $C_{\text{gd}} = 2\text{pF}$,
 $C_{\text{gs}} = 4\text{pF}$, $C_{\text{ds}} = 0.5\text{pF}$, $C_{\text{wi}} = 5\text{pF}$, $C_{\text{wo}} = 6\text{pF}$, $A_v = -3$



- (b) Write note on 'Transistor as Switch'. 10
5. (a) Explain with a neat diagram a transformer coupled audio power amplifier. 10
 (b) Draw and explain wien bridge oscillator. 5
 (c) What do you understand by thermal runaway? 5
6. (a) Draw and explain a series voltage regulator. 10
 (b) Draw the circuits for integrator and differentiator. Derive the necessary equation. Draw the frequency response of these circuits. 10