B. Tech. Sem - III (Electronics) 2014 COURSE) (CBCS) : WINTER - 2018

SUBJECT : ANALOG ELECTRONICS

Day : Monday
Date : 26/11/2018

W-2018-2301

Time : 10.00 AM TO 01.00 PM
Max. Marks : 60

N. B. :

1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Assume suitable data, if necessary.

Q. 1 **a)** Design a fixed bias circuit for CE amplifier such that an operating point is V_{CE}=8V and I_C=2mA, supply voltage is 15V with silicon transistor of β= 100. Consider emitter base voltage is 0.6V. Calculate value of base resistor and load resistor that would be employed. **(06)**

b) Discuss requirements of biasing circuits. **(04)**

OR

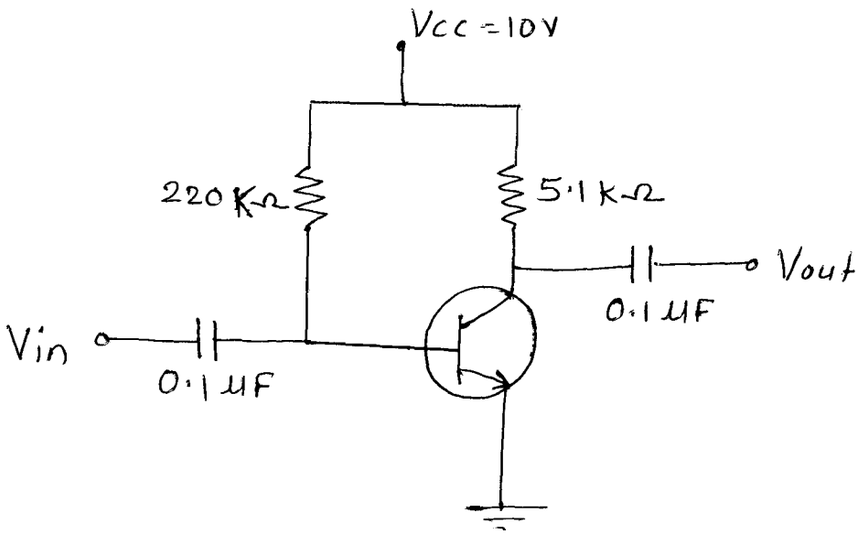
a) Discuss Thermal runaway process in detail with diagram. **(06)**

b) Derive general expression for stability factor. **(04)**

Q.2 Consider a single stage Common Collector amplifier with R_S=1KΩ, R_L=1.2KΩ. **(10)**
If hie=1.1K, hre =2.5X10^{-4}, hfe=50 and hoe=25μA/V
Calculate – A_V, A_{VS}, A_P and R_O

OR

Determine input impedance, output impedance, voltage gain and current gain for CE Amplifier shown in Figure. The h-Parameters of transistor are hfe=60, hie=500Ω at I_C=3mA



P. T. O.

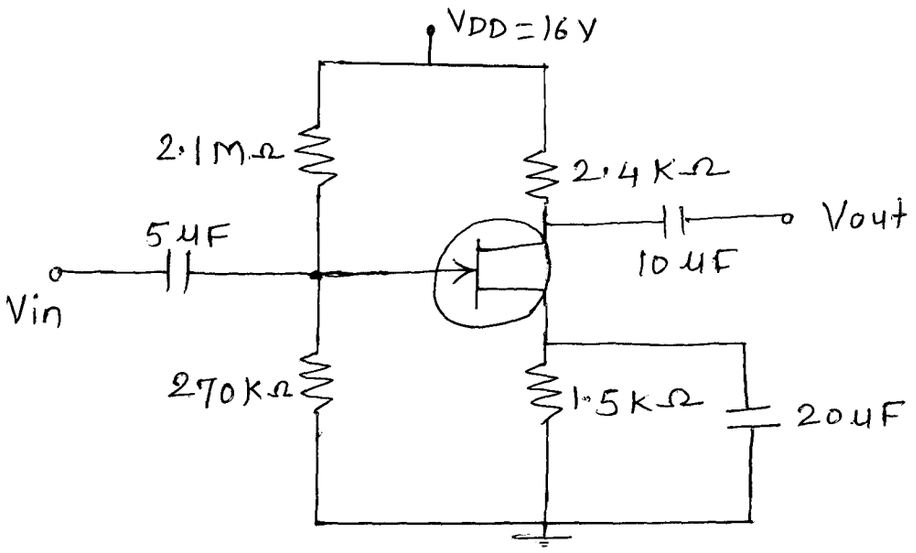
Q.3 **a)** Discuss in detail following JFET parameters: **(10)**

i) Drain resistance
ii) Transconductance
iii) Amplification Factor

Derive the relation between above parameters.

OR

For voltage divider JFET circuit, Find the values of V_D, V_S, V_{DS}, V_{DG}
For I_D=2.4mA, V_{GS}= -1.8V



Q.4 Discuss the operation of n-channel Depletion MOSFET with Negative V_{GS} and positive V_{GS}. Draw the transfer characteristics for the same. **(10)**

OR

Describe the situation when pinch-off occurs in n-channel enhancement MOSFET when positive V_{DS} voltage is applied. Draw the transfer characteristic graph.

Q.5 Discuss the operation of simple and biased positive and negative clipper circuits with input and output waveforms. **(10)**

OR

a) Draw and explain operation of voltage quadrupler circuit **(06)**

b) Draw any one type of multivibrator circuit with waveforms **(04)**

Q.6 **a)** What is photodiode? Why photodiode is always used in reverse biased condition? **(06)**

b) Discuss the operation of photovoltaic cell **(04)**

OR

Describe the rules for preparing artwork in PCB designing process in detail. **(10)**

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