

B.Sc Sem.-3 Examination

CC-201

Electronics

October-2024

Time : 2-30 Hours]

[Max. Marks : 70

Instructions: (1) Symbols used here have their usual meanings.
(2) Figures to the right indicate marks.

- Q-1 (i) Draw a CE Transistor amplifier circuit and discuss the effect of emitter bypass capacitor on low frequency response. (7)
(ii) Explain effect of coupling capacitor on low frequency response of the transistor amplifier. (7)

OR

- (i) Derive the formula for mid-frequency gain for cascaded CE amplifier stages. (7)
(ii) Write a short-note on "Transistor Noise". (7)

- Q-2 (i) Enlist the advantages of negative feedback. Discuss advantage of increased bandwidth. (7)
(ii) An amplifier having a gain of 500 without feed-back has an overall negative feed-back applied which reduces gain to 100. (7)
(1) Calculate the fraction of output voltage fed back.
(2) If due to ageing of components, the gain without feed-back falls by 20%, calculate the percentage fall in gain without feed-back.

OR

- (i) What are the different forms of the negative feedback? Explain voltage shunt feedback in detail. (7)
(ii) In a negative feedback amplifier, $A=100$, $\beta=0.04$ and $V_i=50$ mV. Find (7)
(1) gain with feedback (2) output voltage (3) feedback factor (4) feedback voltage

- Q-3 (i) Explain operation of JFET, when $V_{GS}=0$ and V_{DS} is increased from zero. (7)
(ii) Discuss DC biasing of a JFET. (7)

OR

- (i) Classify FET Family and discuss basic construction of JFET. (7)
(ii) For an N-channel JFET, $I_{DSS} = 8.7$ mA, $V_P = -3V$, $V_{GS} = -1V$. Find the values of (1) I_D (2) g_{mo} (3) g_m . (7)

- Q-4 (i) Enlist different types of filters. Explain shunt capacitor filter in detail. (7)
(ii) Where Bleeder resistor can be placed in the power supply circuit? Discuss the advantages of the Bleeder resistor. (7)

OR

- (i) Write a short-note on C-L-C (π) filter. (7)
(ii) What is voltage regulation? Explain transistor shunt regulator with necessary equations. (7)

- Q-5 Answer in brief (Attempt any seven out of twelve) (14)
(A) Find out r_{be} for $h_{fe}=50$ and transconductance =58 mho.
(B) The ability of an amplifier to handle a square-wave signal is measured by the _____.
(C) The overall voltage gain of an amplifier with cascaded stages will be the _____ of the stage gains and if the stage gains are calculated in dB the overall gain is _____ of the stage gains.
(D) Other names of positive feedback are _____ and _____.

(P.T.O.)

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- (E) What is the effect of negative feedback on the voltage gain of an amplifier?
 - (F) Which kind of feedback is known as degenerative feedback?
 - (G) What is the full form of IGFET?
 - (H) Draw the symbol of N-Channel JFET.
 - (I) Mention one disadvantage of JFET.
 - (J) What is the effect on magnitude of ripple voltage when capacitor value is increased in a capacitor filter circuit?
 - (K) Write an advantage of LC filter over inductor filter.
 - (L) Value of bleeder resistor connected across filter should be such as it conducts _____% of the total current.
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