

B.Sc. Sem.-3 Examination
CC 201
Electronics

Time : 2.30 Hours]

December-2025

[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) Explain effect of positive feedback with suitable example. (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 series 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) Discuss basic construction of JFET. (7)
- (ii) Explain working of DE MOSFET. (7)
- Q-4 (i) What is filter? Enlist various types of filter circuits. Explain series inductor filter with the help of circuit diagram and waveforms. (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)
- (1) Find out r_{be} for $h_{fe}=50$ and transconductance $=58$ mho.
- (2) What is the 3-db frequency?
- (3) What is the effect of cascaded CE stages operating at high frequency on overall bandwidth?
- (4) Calculate the gain of a negative feed-back amplifier whose gain without feed-back is 1000 and $\beta = 1/10$.
- (5) What is the effect of negative feedback on the voltage gain of an amplifier?
- (6) Which kind of feedback is known as degenerative feedback?
- (7) What is the full form of MOSFET?
- (8) Draw the symbol of P-Channel JFET.
- (9) Mention one disadvantage of JFET.
- (10) What is the effect on magnitude of ripple voltage when capacitor value is increased in a capacitor filter circuit?
- (11) Write an advantage of LC filter over inductor filter.