

Time: 3 Hours

Total Marks: 80

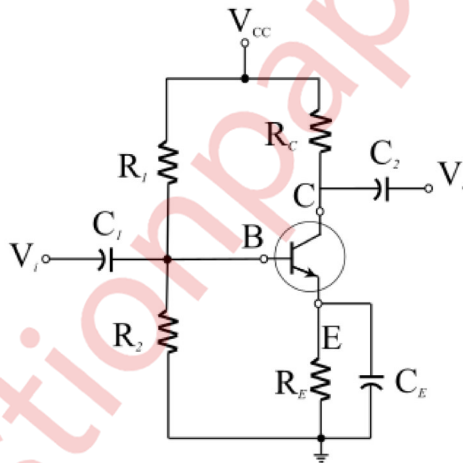
N.B.: All questions are compulsory.

Q1) Answer any FOUR of the following (entire syllabus)

- a. Explain Diode as a clipper. (05)
- b. Explain BJT as a switch. (05)
- c. Explain the operation of D-MOSFET. (05)
- d. Explain the Block diagram of an operational amplifier. (05)
- e. Draw a functional block diagram of IC 555 (05)
- f. Explain the operation of a Zener diode. (05)

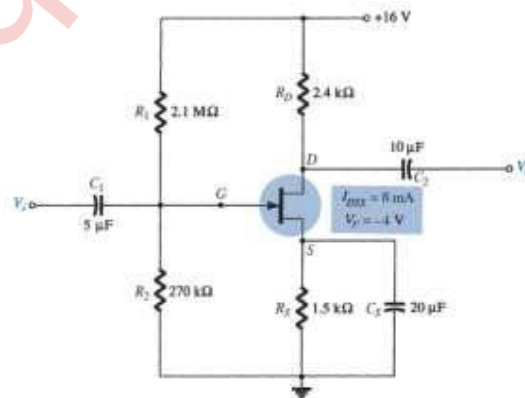
Q2)

- a. Analyse full wave bridge wave rectifier along with 'C' filter. Analyse the impact impact of 'C' filter over ripple factor. (10)
- b. In the following circuit of BJT CE voltage divider bias calculate the Q point.
Given Data: $V_{CC}=18\text{ V}$, $R_1=82\text{ K}\Omega$, $R_2=22\text{ K}\Omega$, $R_C=5.6\text{ K}\Omega$, $R_E=1.2\text{ K}\Omega$, $\beta=50$ (10)



Q3)

- a. Perform small signal analysis over a BJT CE amplifier with voltage divider bias using the h-model. Derive an expression for current gain, input impedance, voltage gain and output impedance. (10)
- b. Find I_{DQ} , V_{GSQ} , V_D , and V_{DS} In the given circuit. (10)



Q4)

- a. Derive expressions for voltage gain and output impedance of MOSFET CS (Self bias) amplifier circuit. (10)
- b. Explain Op-Amp as an inverting summing amplifier. (10)

Q5)

- a. Explain Op-Amp as an instrumentation amplifier. (10)
- b. Design a voltage regulator using IC LM 317 to produce an output voltage of 12.5 volts. (10)

Q6)

- a. Write a short note on a Schottky diode and an opto-isolator. (10)
- b. Explain Op-Amp as a Square wave generator. (10)
