

BE

(OLD COURSE)

QP Code : 4550

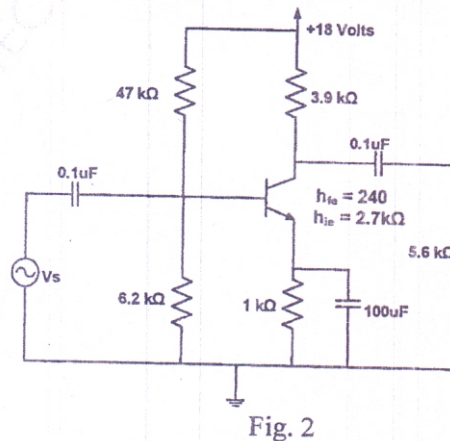
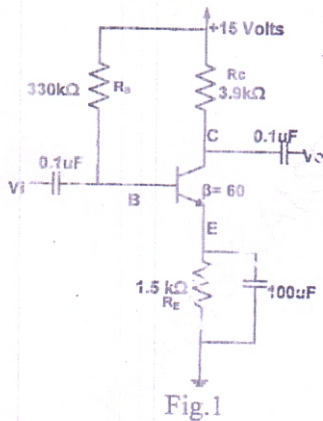
Duration: 3 hours

Max marks: 100

N.B.:

1. Q 1 is compulsory
2. Answer any four out of remaining six questions
3. Assumptions made should be clearly stated
4. Assume any suitable data wherever required but justify the same
5. Illustrate answers with sketches wherever required

- Q.1 (A) Describe the construction, principle of operation and applications of varactor diode. (05)
 (B) Write short notes on (10)
 (i) r_e model of BJT (ii) Hybrid Pi model of BJT
 (C) Explain the operation of double ended clipper with the help of waveforms. Also describe its applications. (05)
- Q.2 (A) Explain the need for biasing and also explain how to achieve the thermal stabilization in a BJT amplifier. What are different thermal compensation circuits? Explain any one of them (10)
 (B) Explain the frequency response characteristics of a RC coupled FET amplifier clearly stating the reasons for attenuation of gain at low and high frequency operation. (10)
- Q.3 (A) Draw a full-wave bridge rectifier circuit with CLC filter and describe the circuit operation with waveforms. Compare the performance of L, C and LC filters. (10)
 (B) Describe the operation of a dual input unbalanced output BJT differential amplifier and derive the relevant AC parameters for it. (10)
- Q.4 (A) Describe the current series type of negative feedback in an amplifier circuit and state its impact on voltage gain, current gain, input impedance and output impedance. Also give a schematic of a practical BJT amplifier with current series type of negative feedback and justify the effect of feedback on the above parameters. (10)
 (B) For the circuit shown in Fig-1, calculate the operating (Q) point voltages V_{CE} , V_{BC} and currents I_C , I_B and I_E . What will be the impact of variation in biasing resistors on stability of the Q point? (10)



- Q.5 (A) Draw the approximate h-parameter equivalent model for the circuit given in Fig.2. Calculate the input impedance, output impedance, voltage gain and the current gain of the given amplifier. (12)
 (B) Explain the method to estimate the lower cutoff frequency for the amplifier shown in the Fig-1 and calculate the same. (08)
- Q.6 (A) Compare the following (12)
 (i) MOSFET and JFET (ii) CC and CE BJT amplifiers
 (iii) CS and CD JFET amplifiers
 (B) Derive expressions for voltage gain, current gain and input impedance of a common collector BJT amplifier. (08)
- Q.7 Write short notes on (20)
 (i) Opto-isolator and its applications
 (ii) Voltage doubler
 (iii) Photo voltaic Cell