USN | | | | | | | | | | |

10CS32

Third Semester B.E. Degree Examination, Feb./Mar. 2022
Electronic Circuits

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting at least TWO full questions from each part.***

PART – A

1 a. With the help of Common-Emitter fixed bias, amplifier configuration explain the criteria for selection of a suitable operating point and the factors affecting its stability. Brief the advantages and disadvantages of fixed bias circuit. **(10 Marks)**

b. For a fixed-bias circuit of Fig.Q.1(b), determine the operating point (given that transistor gain $\beta = 100$, $V_{BE} = 0.7V$). Also draw the load line for the circuit. **(05 Marks)**

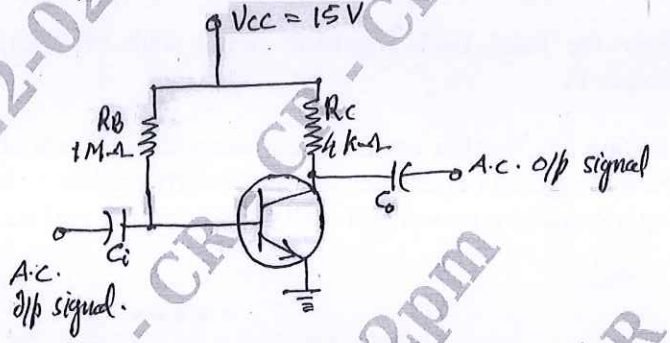

Fig.Q.1(b)

c. Explain how transistor works as a switch with necessary figures. **(05 Marks)**

2 a. Bring the difference between JFET and MOSFETs. **(05 Marks)**

b. With figure explain the construction and principle of operative of JFET (for N-channel and P-channel). Plot the characteristic carve for N-channel. JFET with $V_{GS} = 0$ and positive value of V_{DS}. **(10 Marks)**

c. Explain CMOS devices and what are the important characteristics and advantages as compared to BJT-based logic circuit. Brief CMOS used as invertor circuit. **(05 Marks)**

3 a. Define photosensors. List and explain the major characteristic parameters used to characterize the performance of photosensors. **(10 Marks)**

b. Draw the circuit symbol of a phototransistor and show the V-I characteristics curve. **(05 Marks)**

c. List and brief the parameters of a LED device. **(05 Marks)**

4 a. Draw the h-parameter model of a two-fort network and determine h-parameters: h_{11}, h_{12}, h_{21}, h_{22}. **(05 Marks)**

b. With figure explain bootstrapping in Darlington amplifier. **(05 Marks)**

c. Draw the circuit diagram of a cascaded three stage R-C-coupled BJT amplifier and find for A_v, Z_i and Z_o. **(10 Marks)**

PART – B

5 a. Draw the block schematic of amplifier with negative feedback and derive the expression for A_f. (05 Marks)

b. List and advantages of negative feedback. (05 Marks)

c. For a voltage series feedback circuit derive the expression for: Gain, Rif and Rof. (10 Marks)

6 a. Define Barkhausen criterion of oscillation considering negative feedback circuit. (05 Marks)

b. Draw the circuit diagram of buffered RC phase shift oscillator and what is the oscillator frequency. (05 Marks)

c. Draw the circuit diagram of Bistable multivibrator and explain its working showing the timing waveforms. (10 Marks)

7 a. List and explain the characteristic parameters that define the quality of a regulated power supply. (05 Marks)

b. List and brief some of the salient features of linear and switched mode power supplies. (05 Marks)

c. Draw the basic back regulator circuit with brief explanation. Also draw the relevant waveform. (10 Marks)

8 a. Mention any five key op-amp parameters and brief about each one. (05 Marks)

b. Draw the circuit of peak detector and briefly explain its operation using Op-Amps. (05 Marks)

c. Explain relaxation oscillator with circuit diagram and relevant waveforms. (10 Marks)

* * * * *