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10CS32

Third Semester B.E. Degree Examination, Aug./Sept.2020
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. Explain the self-biased transistor amplifier and obtain the expressions for its operating point. (08 Marks)
- b. Determine the operating point for the following transistor amplifier circuit. (06 Marks)

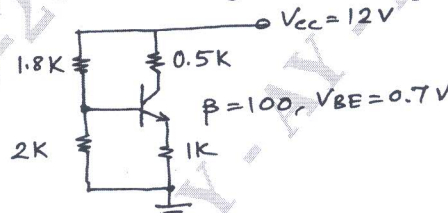


Fig.Q.1(b)

- c. Explain the working of SCR with the help of its equivalent circuit and VI characteristic. (06 Marks)
- 2 a. Explain the construction and working of a n-channel E-MOSFET. (08 Marks)
- b. Following Fig.Q.2(b) shows a circuit using E-MOSFET. Given that the threshold voltage of MOSFET is 2V and $I_{D(ON)} = 6\text{mA}$ for $V_{GS(ON)} = 5\text{V}$. Determine the operating point. (08 Marks)

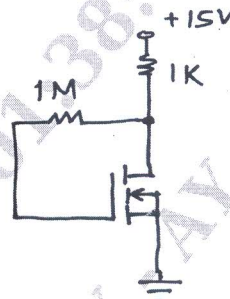


Fig.Q.2(b)

- c. Write any four differences between JFETs and MOSFETs. (04 Marks)
- 3 a. What are photoconductors? Explain their classification, characteristics and applications. (06 Marks)
- b. Explain the photodiodes, their types and applications. (08 Marks)
- c. Describe the different LED drive circuits. (06 Marks)
- 4 a. Draw a neat sketch of h-parameter model of CE-transistor configuration and explain. (06 Marks)
- b. Determine the values of voltage gain, current gain, input impedance and output impedance for the voltage divider biased transistor amplifier shown in Fig.Q.4(b) using simplified h-parameter model. Given $h_{ie} = 1.5\text{K}$, $h_{fe} = 100$, $h_{oe} = 25\mu\text{A/V}$. (08 Marks)
- c. Draw the low frequency model a JFET and explain. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

PART – B

- 5 a. With a neat block schematic of a feedback amplifier, explain the effect of negative feedback on the gain. (06 Marks)
- b. A voltage amplifier is characterized by an open-loop voltage gain of 100, input resistance of 50K and output resistance of 2K. Negative feedback of 10% of output voltage is introduced in series with the input to bring the distortion below acceptable level. Find the modified values of these parameters. (06 Marks)
- c. Derive the expressions for input resistance and output resistance of voltage-series feedback topology of a transistor amplifier. Draw the equivalent circuit. (08 Marks)
- 6 a. State the conditions for sustained oscillations. Explain briefly the different types of oscillators. (06 Marks)
- b. With a neat diagram, explain the operation of a Voltage Controlled Oscillator (VCO). (06 Marks)
- c. Draw the circuit diagram of astable transistor multivibrator and explain its operation with relevant waveforms. (08 Marks)
- 7 a. Explain the constituents of a linear power supply with the help of a block diagram. (05 Marks)
- b. Explain the 3-pin IC voltage regulators and their use. (07 Marks)
- c. Differentiate between buck and boost mode operation of SMPS with the help of neat diagrams. (08 Marks)
- 8 a. Explain the following performance parameters of Op-Amps:
i) Bandwidth
ii) Slewrate
iii) CMRR
iv) PSRR. (08 Marks)
- b. Draw the circuit diagram of an Instrumentation amplifier using Op-Amp and explain its operation. (06 Marks)
- c. Draw the circuit diagram of relaxation oscillator using Op-Amp and explain its operation with appropriate waveforms. (06 Marks)
