

Third Semester B.E. Degree Examination, June/July 2016
Electronic Circuits

Time: 3 hrs.

Max. Marks:100

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

PART - A

- 1 a. With the help of common – emitter amplifier configuration, explain the criteria for selection of a suitable operating point and the factors affecting its stability. (08 Marks)
- b. Fig. Q1(b)(i) shows the transistor as an inverting switch with the desired output waveform for the given input waveform as shown in Fig. Q1(b)(ii). Find the value of V_{CC} , R_C and R_B given that $\beta = 80$, $I_{C(sat)} = 10 \text{ mA}$, the output voltage V_{out} when the transistor is off is 12 V , $V_{BE} = 0.7 \text{ V}$. (08 Marks)

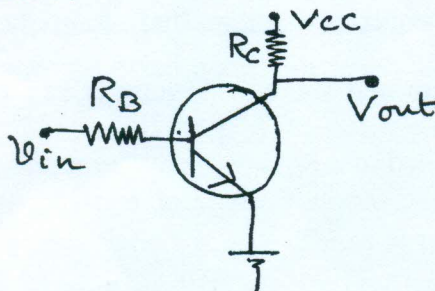


Fig. Q1(b)(i)

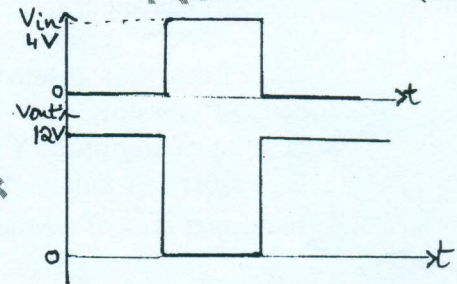


Fig. Q1(b)(ii)

- c. Explain the gate triggering characteristics of an SCR. (04 Marks)
- 2 a. Draw and explain the working of D-MOSFET with the help of drain current and transconductance curve. When the voltage is applied to the gate of a P-Channel D-MOSFET, does the current flow depleted or enhanced? (12 Marks)
- b. Fig. Q2(b) shows a circuit using E – MOSFET given that the threshold voltage for the MOSFET is 2 V and $I_{d(on)} = 6 \text{ mA}$ for $V_{GS(on)} = 5 \text{ V}$, determine the volume of the operating point. (08 Marks)

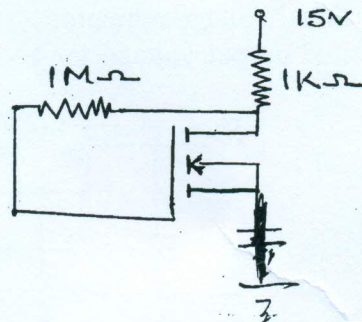


Fig. Q2(b)

- 3 a. What are photodiodes? Explain with VI characteristics. (05 Marks)
- b. Determine the cut-off wave length for silicon and germanium photodiodes, given that their Bandgap energies are 1.1 eV and 0.72 eV , respectively, at 25°C . How will the cut off wave length change when the operating temperature change form 25°C to 200°C ? (05 Marks)
- c. Write short note on :
- Cathode ray tube display
 - Emerging display technologies.

(10 Marks)

- 4 a. Explain how the h-parameters are determined by making use of transistor's input and output characteristics. (10 Marks)
- b. Carryout the analysis of a transistor amplifier operating in common emitter fixed bias configuration with suitable derivations. (10 Marks)

PART - B

- 5 a. Distinguish between class A, class B, Class C, class D, class AB amplifiers in terms of conduction angle, operating region, application and efficiency. (05 Marks)
- b. Explain all four feedback topologies with appropriate circuit diagrams. (10 Marks)
- c. An amplifier has a open - loop voltage gain $A_v = 1000 \pm 100$. It is required to have an amplifier whose voltage gain varies by no more than $\pm 0.1\%$.
- i) Find the value of feedback factor β
- ii) Find gain with feedback. (05 Marks)
- 6 a. Explain Barkhausen criteria with suitable circuit diagrams and essential conditions. (05 Marks)
- b. Explain with a neat connection diagram and waveforms how IC555 timer is used as the astable multivibrator. (08 Marks)
- c. A step input of amplitude 8 volts is applied to a RC low - pass circuit shown in Fig. Q6(c)(i) and Fig. Q6(c)(ii) below. Determine the output voltage at end of : i) 2m/sec ii) 5m/sec
- iii) Find upper cut-off frequency f_w and rise time t_r . (07 Marks)

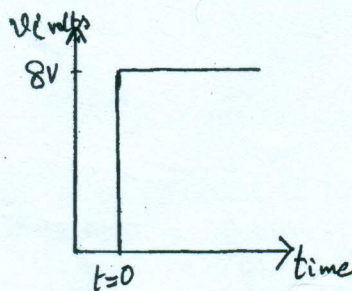


Fig. Q6(c) (i)

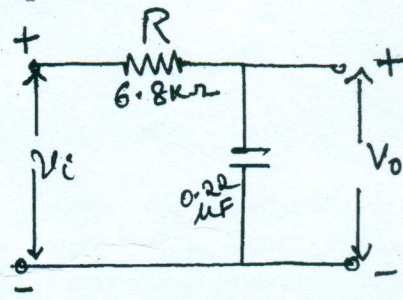


Fig. Q6(c)(ii)

- 7 a. Write a note on 3 terminal voltage regulator. (05 Marks)
- b. Determine the regulated output voltage for LM 317 voltage regulator shown in Fig. Q7(b). (05 Marks)

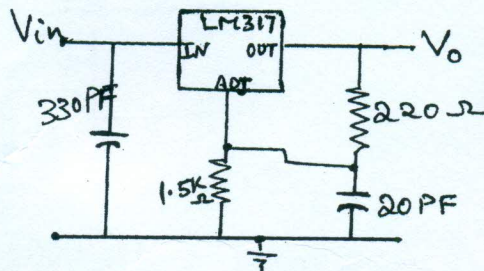


Fig. Q7(b)

- c. What are switching regulators? Describe the basic topology of Boost regulator. (10 Marks)
- 8 a. Differentiate ideal Op-Amp and practical Op-Amps. (05 Marks)
- b. Discuss performance parameters of operational amplifiers. (10 Marks)
- c. Explain Op-Amp as peak detector circuit. (05 Marks)