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10CS32

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 $\beta = 80$, $I_{C(sat)} = 10$ mA, the output voltage V_{out} when the transistor is off is 12 V, $V_{BE} = 0.7V$. **(08 Marks)**

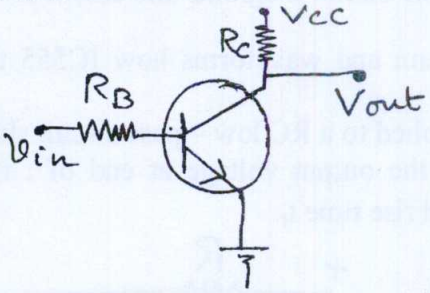

Fig. Q1(b)(i)

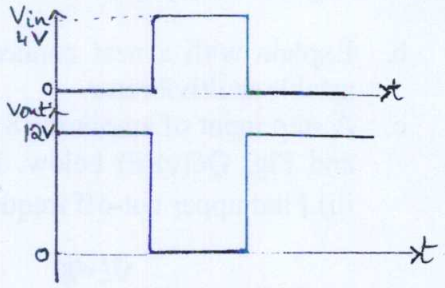

Fig. Q1(b)(ii)

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 $I_{d(on)} = 6$ mA for $V_{GS(on)} = 5V$, determine the volume of the operating point. **(08 Marks)**

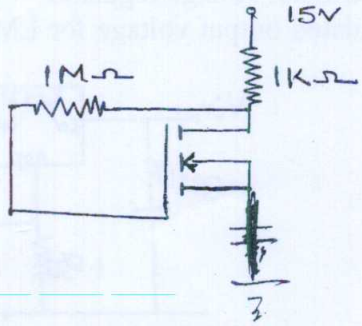

Fig. Q2(b)

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 :
i) Cathode ray tube display
ii) 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 interms 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)**

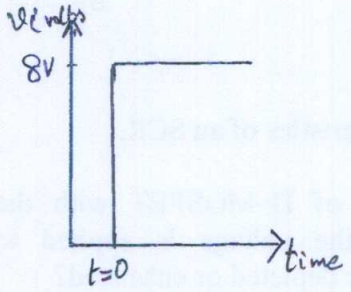

Fig. Q6(c) (i)

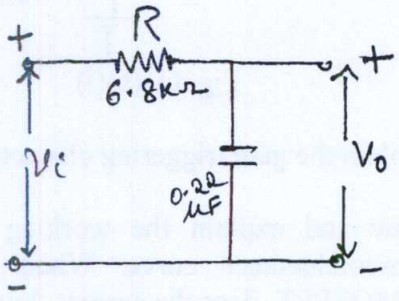

Fig. Q6(c)(ii)

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)**

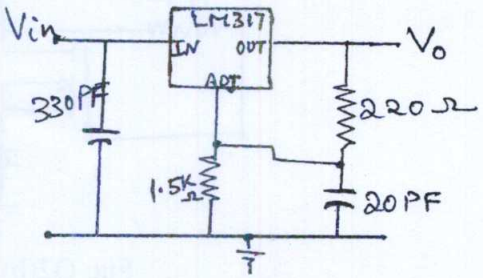

Fig. Q7(b)

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)**

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