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10CS32

Third Semester B.E. Degree Examination, Dec.2017/Jan.2018
Electronic Circuits

Time: 3 hrs.

Max. Marks:100

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

PART - A

- 1 a. Draw the fixed bias circuit using BJT and derive the expressions for operating point. Mention its advantages and disadvantages. (08 Marks)
- b. For the circuit shown in Fig. Q1(b) determine the operating point. Given $\beta = 100$, $V_{BE} = 0.7V$

(04 Marks)

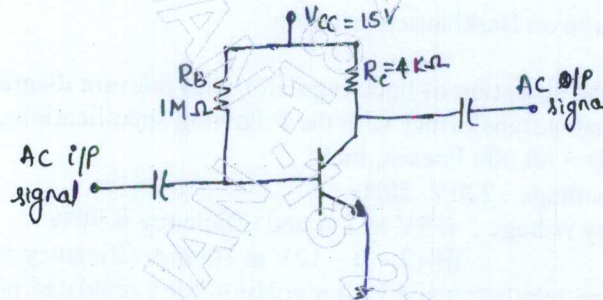


Fig. Q1(b)

- c. Explain the working of transistor as a switch and define delay time, rise time, storage time and fall time with respect to transistor switching. (08 Marks)
- 2 a. Explain the construction, operation and characteristics of N-channel E-MOSFET with sketches. (10 Marks)
- b. Briefly discuss the basic operation of CMOS inverter with a neat diagram. Mention two advantages of CMOS. (06 Marks)
- c. List the difference between JFET's and MOSFETS (any four). (04 Marks)
- 3 a. What is an optocouplers? Explain the parameters of optocouplers in brief. (06 Marks)
- b. Explain any six characteristics parameters of photo sensors. (06 Marks)
- c. Explain the basic operation and construction of LED and also discuss the different LED characteristics. (08 Marks)
- 4 a. Draw the generalized h-parameter model of a transistor based amplifier and derive the expression for :
 i) Current gain
 ii) Input Impedance
 iii) Voltage gain
 iv) Output admittance. (10 Marks)
- b. Discuss the effect of coupling and bypass capacitors on the low frequency response of the voltage divider BJT amplifier with relevant sketches. (10 Marks)

PART – B

- 5 a. Derive the expression for voltage gain, Input resistances and output resistance in case of voltage series feedback with a neat diagram. (10 Marks)
- b. What are the advantages of negative feedback? (06 Marks)
- c. An amplifier without feedback has a voltage gain of 100.
- i) Determine the gain of the amplifier with an introduction of 10% negative feedback.
- ii) Also find the feedback factor, if the gain required with feedback is 50. (04 Marks)
- 6 a. Explain the operation of monostable multi-vibrator with a neat diagram. (using BJT). (08 Marks)
- b. Explain RC low pass circuit and discuss the behavior of this circuit for step and pulse inputs. (08 Marks)
- c. Write a note on Barkhausen criterion. (04 Marks)
- 7 a. Explain the operation of buck regulator with relevant diagrams. (10 Marks)
- b. Design mains transformer with the following specifications,
Assume $B = 60,000$ lines/sq.inch.
Primary voltage : 220V, 50Hz
Secondary voltage : i) 5V at 1 A and efficiency is 90%
ii) 12 – 0 – 12V at 100mA efficiency is 90% (06 Marks)
- c. Define line regulation and load regulation for a regulated power supply. (04 Marks)
- 8 a. Define the following as referred to op-amp
- i) Bandwidth
- ii) CMRR
- iii) PSRR
- iv) Slew rate
- v) Open loop gain
- vi) Setting time (06 Marks)
- b. Give a comparison between ideal op-amp with practical op-amp. (06 Marks)
- c. With neat figure and relevant waveform, explain the working of relaxation oscillator circuit using op-amp. (08 Marks)
