

C.U.SHAH UNIVERSITY

Winter Examination-2019

Subject Name: Analog Electronics Circuits

Subject Code: 4TE03AEC1

Branch: B.Tech (Electrical)

Semester: 3

Date :15/11/2019

Time : 02:30 To 05:30

Marks : 70

Instructions:

- (1) Use of Programmable calculator & any other electronic instrument is prohibited.
 - (2) Instructions written on main answer book are strictly to be obeyed.
 - (3) Draw neat diagrams and figures (if necessary) at right places.
 - (4) Assume suitable data if needed.
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Q-1

Attempt the following questions:

(14)

- 1) The efficiency of a full wave bridge rectifier is_____.
- 2) If the value of capacitor increases, ripple voltage at output side of rectifier decreases.Determine whether the given statement is TRUE or FALSE.
- 3) What is the maximum efficiency of *transformer coupled class A* amplifier?
- 4) Ripple factor of half wave rectifier is_____%
- 5) Which transistorDC biasing circuit is *beta (β) independent*?
- 6) If a negative feedback is provided to an amplifier, the gain of the amplifier increases.Determine whether the given statement is TRUE or FALSE.
- 7) For a BJT amplifier, if base to emitter voltage $V_{be} = 0.82 V$ and base current $I_b = 45 \mu A$, what will be the value of input impedance h_{ie} ?
- 8) How much phase difference is provided by a single RC section in a RC phase shift oscillator?
- 9) Which type of feedback is provided in an oscillator?
- 10) A transistor operating as an emitter followerprovides theoutput signal from_____ terminal of the BJT.
- 11) A 7912 is used in a regulated voltage power supply. How much constant output voltage power supply will provide?
- 12) List any four characteristics of an ideal op-amp.
- 13) Draw the equivalent circuit of an ideal opamp.

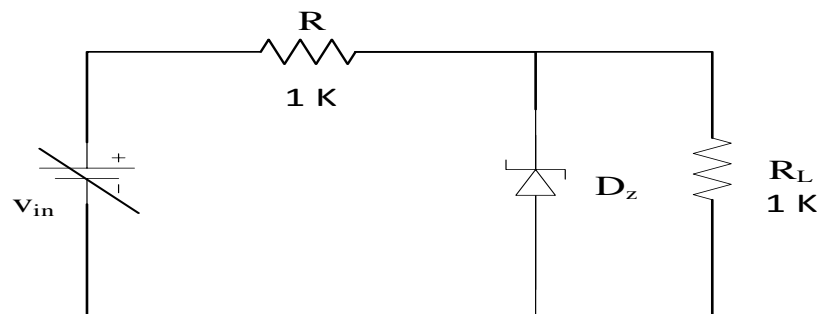


- 14) An input voltage of 100 mV (peak) is given to the common emitter amplifier. The output voltage of an amplifier is 1V (peak). Determine the gain of an opamp.

Attempt any four questions from Q-2 to Q-8

Q-2 Attempt all questions (14)

- (a) Draw the circuit diagram of full wave bridge wave rectifier and explain its operation. Draw the waveforms of supply voltage, load voltage and load current. **07**
- (b) In a shunt regulator circuit using Zener diode as shown in the below figure, the series resistance used is $1\text{ k}\Omega$. It provides 5 V to a load of $1\text{ k}\Omega$. If $I_{zmin} = 2\text{ mA}$ and $I_{zmax} = 30\text{ mA}$, what is the range of the input voltage for the output voltage to remain constant. **07**



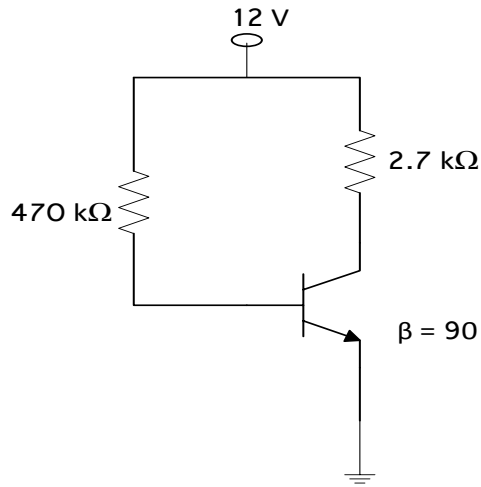
Q-3 Attempt all questions (14)

- (a) Explain zener shunt regulator circuit for varying input voltage. (Line regulation) **07**
- (b) A single phase diode bridge rectifier is fed at $110\text{ V}, 50\text{ Hz}$. The load is $R=470\ \Omega$. **07**
 Find i) Average Output Voltage ii) RMS Output Voltage
 iii) DC Output Power iv) Efficiency

Q-4 Attempt all questions (14)

- (a) Draw the h-parameter model for CE transistor and obtain the equation for input impedance, forward current transfer ratio and reverse voltage transfer ratio. **07**
- (b) For the below fixed bias circuit, for $\beta=90$, Determine **07**
 i) I_B ii) I_C iii) V_{CE}





Q-5 Attempt all questions (14)

- (a)** List the advantages of negative feedback in amplifier and explain any two of them. **07**
- (b)** Draw circuit diagram of Class B push pull amplifier and explain its operation. **07**

Q-6 Attempt all questions (14)

- (a)** Draw the circuit diagram of series fed Class A amplifier and prove that its maximum efficiency is 25%. **07**
- (b)** Explain the following modes of operational amplifier for open loop configuration. **07**
 (i) Differential Amplifier (ii) Inverting Amplifier (iii) Non-inverting Amplifier

Q-7 Attempt all questions (14)

- (a)** Explain the theory of Barkhausen criteria for oscillation in an oscillator circuit. **07**
- (b)** Draw the circuit diagram of Hartley's oscillator and explain its operation. Derive the equation for the frequency of oscillation. **07**

Q-8 Attempt all questions (14)

- (a)** Draw the pin diagram of 741 IC op-amp and explain the function of each pin. **07**
- (b)** Draw and explain voltage divider bias circuit for BJT. **07**

