3E1144

Roll No. _____ Total No of Pages 4

3E1144

B. Tech. III - Sem. (Main / Back) Exam., Dec. 2019

PCC Electrical & Electronics Engineering

3EX4-06 Analog Electronics

EE, EX

Time: 3 Hours **Maximum Marks: 120**

Instructions to Candidates:

Attempt all ten questions from Part A, five questions out of seven questions from Part B and four questions out of five from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205).

1. NIL 2. NIL

PART – A

(Answer should be given up to 25 words only) [10×2=20]

All questions are compulsory

Q.1 What is PIV of a diode in a rectifier circuits?

Q.2 What is Zener diode? Draw its V – I characteristics.

Q.3 What are multistage amplifiers?

Q.4 State Barkhausen's criteria for oscillation.

Q.5 What is an oscillator? How does it differ from an amplifier?

Q.6 What is the Miller Effect?

Q.8 What is the use of Bleeder in Zener voltage Regulator?

Q.9 What is the advantage of stagger tuned Amplifier?

Q.10 Define the 'T' model of a Bipolar Transistor.

PART – B

(Analytical/Problem solving questions) **[5×8=40]**

Attempt any five questions

Q.1 What do you mean by the peak inverse voltage of the diode? Show that when a capacitor is connected across the load resistance of a half wave rectifier circuit, and then the peak inverse voltage of the diode is approximately twice the peak voltage of the input signals.

Q.2 Draw the input static characteristics curves of a PNP transistor in common emitter configuration. Explain the shapes of these curves qualitatively.

Q.3 Draw and explain the drain and transfer characteristics of an N - channel depletion MOSFET.

Q.4 The mid frequency gain of a RC coupled amplifier is 100. The values of lower and higher cut off frequencies are 100 Hz and 100 kHz. Find the frequency at which the gain reduces to 90.

Q.5 Describe with necessary derivations, the effect of negative feedback on the bandwidth and distortion in an amplifier.

Q.6 Explain the lag and lead compensator using an op – amp.

Q.7 What is the precision circuit? Explain the precision Half – Wave Rectifier in detail.

PART – C

(Descriptive/Analytical/Problem Solving/Design Questions) **[4×15=60]**

Attempt any four questions

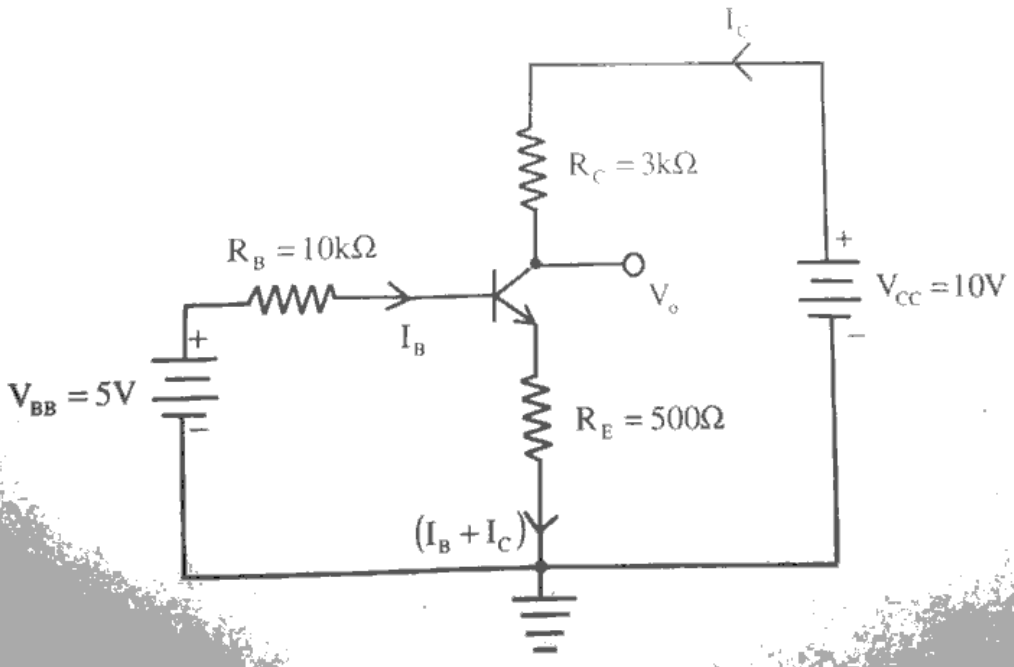
Q.1 It is required to design full wave rectifier with shunt capacitor filter which is capable of supplying 20 Volts d.c. at no load. The regulation of this supply is required to be less than 10% for a full load current of 1 ampere. The maximum ripple is to be less than 3 Volts (peak to peak). Find -

(a) The required secondary rating of the transformer.

(b) The value and voltage rating of the capacitor

(c) The peak forward current and PIV rating of the diodes.

Q.2 For the circuit shown in figure 1, assume $\beta = 100$. Find (a) If the Si transistor is in cutoff, saturation or in active region, (b) output voltage V_o, and (c) minimum value for R_E for which the transistor operates in the active region.



(figure1)

Q.3 Explain the Hybrid π - Model for the CE transistor amplifier. Find the expression for higher cutoff frequency and show that the current gain falls by $\frac{1}{\sqrt{2}}$ times the low frequency gain (or 3 db fall of gain).

Q.4 Draw and explain the working of R – C phase shift oscillator and also derive an expression for its frequency of oscillation.

Q.5 Write a note on following –

(a) Zero crossing detector

(b) Analog to Digital conversion
