

011301**Mar. 2022****B.Tech. (AIML/CE/CSE/IT) III SEMESTER
Analog Electronic Circuits (ESC-301)**

Time : 90 Minutes]

[Max. Marks : 25

Instructions :

1. *It is compulsory to answer all the questions (1 mark each) of Part-A in short.*
2. *Answer any three questions from Part-B in detail.*
3. *Different sub-parts of a question are to be attempted adjacent to each other.*

PART-A

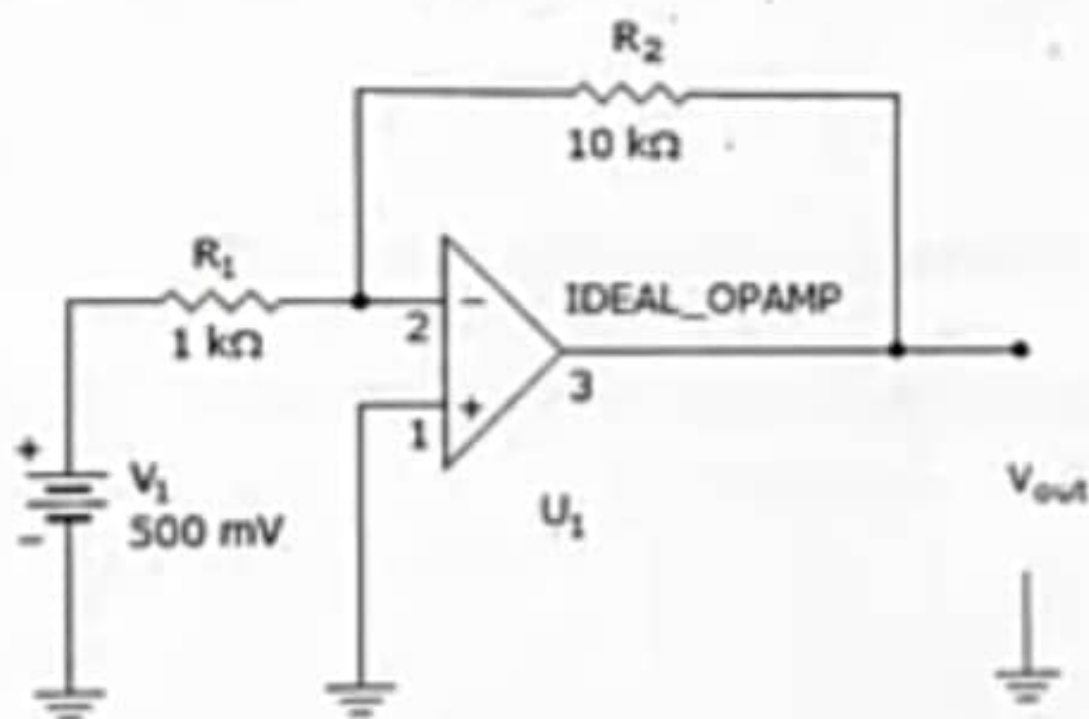
1. (a) What is the collector current for a CE configuration with a beta of 100 and a base current of 30 micro A?
(1)
- (b) The RMS value of a half wave rectifier current is 10 A. Its value for full wave rectifier would be. (1)
- (c) A certain non-inverting amplifier has R_i of 1 K ohm and R_f of 100 K ohm. The closed-loop voltage gain is.
(1)

- (d) What is an angle of phase shift for each designed RC network in phase shift oscillator circuit? (1)
- (e) What is DC average current of a half wave rectifier output ? (1)
- (f) With a differential gain of 50,000 and a common mode gain of 2, what is CMRR? (1)
- (g) What is the necessary condition of gain while designing RC phase shift oscillator in order to ensure the sustained oscillations? (1)
- (h) What is pinch off voltage in a FET? (1)
- (i) What is dimension of h_{ie} parameter? (1)
- (j) What is phase difference between the input and output voltages in a common base arrangement ? (1)

PART-B

- 2. (a) Draw the circuit diagram of centre tap full wave rectifier and explain its working. Also determine (i) average dc output current (ii) rms output current (iii) ripple factor (iv) rectification efficiency (v) PIV. (3)
- (b) Explain Zener diode as a voltage regulator. (2)
- 3. (a) Explain the circuit diagram of biased clipper circuit. (3)
- (b) Explain the characteristics of an ideal op-amp. (2)

4. Sketch a family of output characteristics for a Common Emitter amplifier for a p-n-p transistor. Clearly indicate active, saturation and cut off region and also explain it. Also define α and β , find the relation between them. (5)
5. (a) Explain diagram of comparator and zero crossing detector with their waveforms. (3)
- (b) What is the output voltage? (2)



6. (a) Explain MOSFET structure and its V-I characteristics. (2)
- (b) Design a LPF with passband gain of 4 and cut off frequency of 1 kHz. (3)