

# CBCS SCHEME

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15EE34

## Third Semester B.E. Degree Examination, Dec.2018/Jan.2019 Analog Electronic Circuits

Time: 3 hrs.

Max. Marks: 80

*Note: Answer any FIVE full questions, choosing one full question from each module.*

### Module-1

- 1 a. Explain diode positive shunt clipper circuit with waveforms and transfer characteristics. (05 Marks)
- b. What is transistor biasing? Explain emitter bias circuit with relevant circuit and equations. (06 Marks)
- c. Design a suitable circuit represented by the box shown below, which has input and output waveforms as indicated. (05 Marks)

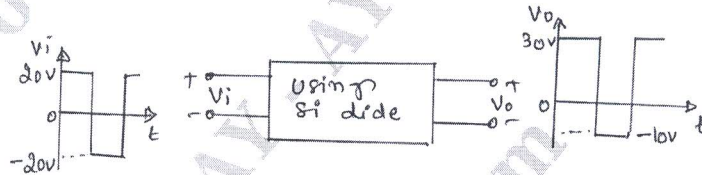


Fig.Q.1(c)

OR

- 2 a. What is Clamping circuit? Explain the negative Clamping circuit with necessary waveforms. (05 Marks)
- b. Obtain the expression for stability factors  $S(I_{CQ})$  and  $S(V_{BE})$  for fixed bias circuit. (06 Marks)
- c. For the fixed bias circuit as shown in below Fig.Q.2(c). Assuming  $V_{BE} = 0.7V$  and  $\beta = 60$ . Find: i)  $I_{BQ}$ ,  $I_{CQ}$  and  $V_{CEQ}$  ii)  $V_B$  and  $V_C$ . (05 Marks)

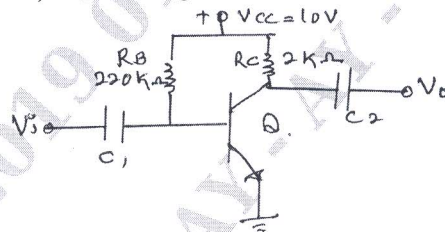


Fig.Q.2(c)

### Module-2

- 3 a. What are the advantages of h-parameters? (04 Marks)
- b. Obtain an h-parameter equivalent circuit of CB and CE configuration. (06 Marks)
- c. For the circuit shown below. Determine: i)  $r_e$  ii)  $Z_i$ ,  $Z_o$ ,  $A_v$  and  $A_i$  taking  $r_o = \infty\Omega$ . (06 Marks)

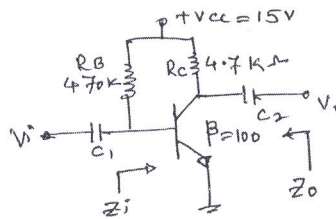


Fig.Q.3(c)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and/or equations written eg, 42+8 = 50, will be treated as malpractice.

OR

- 4 a. Explain the low frequency response of single stage RC coupled amplifier. (08 Marks)  
 b. What is Miller effect? Derive the equations for miller input and output capacitance. (08 Marks)

**Module-3**

- 5 a. What is a cascading amplifier? Obtain the expression for over all voltage gain for 3 stage amplifier. (06 Marks)  
 b. With the help of block diagram, explain the concept of feed back. (07 Marks)  
 c. Write the important characteristics and application of Darlington emitter follower. (03 Marks)

OR

- 6 a. Obtain expression for voltage gain, input impedance and output impedance of a Darlington emitter follower. Draw the necessary equivalent circuit. (08 Marks)  
 b. Write the important advantages of a negative feed back amplifier and show that how band width of an amplifier increases with negative feed back. (08 Marks)

**Module-4**

- 7 a. Explain the operation of a class B push-pull amplifier and derive its conversion efficiency. (06 Marks)  
 b. With a neat circuit diagram, explain the operation of BJT Colpitt's oscillator. (05 Marks)  
 c. The following distortion readings are available for a power amplifier:  
 $D_2 = 0.2$ ,  $D_3 = 0.02$ ,  $D_4 = 0.06$  with  $I_1 = 3.3A$  and  $R_C = 4\Omega$ . Calculate: i) THD  
 ii) Fundamental power component ( $P_1$ ) iii) Total power ( $P_T$ ). (05 Marks)

OR

- 8 a. Mention the classification of power amplifier and explain series fed class A power amplifier with conversion efficiency. Write its merits and demerits. (08 Marks)  
 b. With a neat circuit diagram, explain the working of series resonant crystal oscillator. A crystal has  $L = 0.334H$ ,  $C = 0.065 PF$ ,  $C_M = 1PF$  and  $R = 5.5K\Omega$ . Calculate its series and parallel resonant frequency. (08 Marks)

**Module-5**

- 9 a. Explain the construction, working and characteristics of n-channel JFET. (08 Marks)  
 b. For the FET amplifier shown below: i) Calculate  $Z_i$  and  $Z_o$  ii) Calculate  $A_v$ .  $I_{DSS} = 15mA$ ,  $V_p = -6V$ ,  $Y_{os} = 25\mu S$ . (05 Marks)

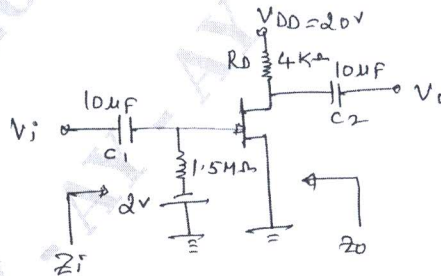


Fig.Q.9(b)

- c. Write important characteristics of common-source configuration of JFET. (03 Marks)

OR

- 10 a. Define trans conductance  $g_m$  and derive an expression for  $g_m$ . (06 Marks)  
 b. Compare JFET and MOSFET. (04 Marks)  
 c. Explain the operation and characteristic of n-channel MOSFET. (06 Marks)

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