

**Third Semester B.E. Degree Examination, December 2012**  
**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. Explain transistor in its fixed bias mode with relevant expression. (06 Marks)
- b. With a neat sketch, explain transistor as a switch. (06 Marks)
- c. For the circuit shown calculate  $I_B$ ,  $I_C$ ,  $V_{CE}$ ,  $V_C$ ,  $V_E$ ,  $V_B$ . Assume  $\beta = 100$ . (08 Marks)

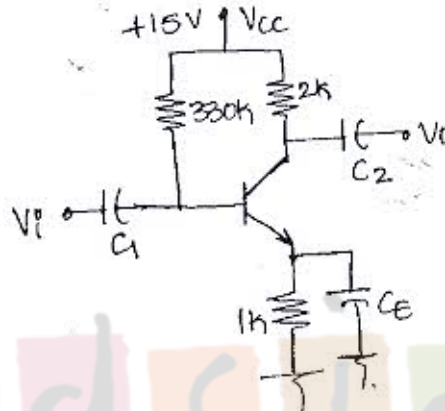


Fig.Q.1(c)

- 2 a. Explain the VI characteristics of n-channel JFET and define various conditions. (08 Marks)
- b. Explain the construction and working of n-channel depletion mode MOSFET. (08 Marks)
- c. Mention merits and demerits of IGBT. (04 Marks)
- 3 a. Explain the construction and working of phototransistor and mention its applications. (10 Marks)
- b. What are optocouplers? Explain the working and characteristics of optocoupler. (10 Marks)
- 4 a. Derive expression for  $A_i$ ,  $Z_i$ ,  $A_v$ ,  $Y_o$ ,  $A_p$  for a transistor amplifier using h-parameter model. (12 Marks)
- b. Explain the need for cascading amplifier and with the block diagram, explain two stage cascaded amplifier. (08 Marks)

**PART - B**

- 5 a. Explain different fb amplifiers. (08 Marks)
- b. With the block diagram, explain the negative feedback in small signal amplifier. (06 Marks)
- c. An amplifier having a voltage gain of 60dB uses  $1/20^{\text{th}}$  of its output in negative feedback. Calculate the gain with feedback, the percentage change in gain without and with feedback consequent on 50% change in  $g_m$ . (06 Marks)

- 6 a. Explain the construction and working of RC phase shift oscillator. (08 Marks)  
b. Find the frequency of the oscillations of a Colpitts oscillator having  $C_1 = 150\text{pF}$ ,  $C_2 = 1.5\text{ nF}$  and  $L = 50\mu\text{H}$ . (04 Marks)  
c. With a circuit diagram, explain the working of RC low pass and RC high pass circuits. (08 Marks)
- 7 a. With a block diagram, explain the working of three terminal voltage regulators. (06 Marks)  
b. Explain the construction and working of SMPS and mention different types of switching regulators. (08 Marks)  
c. Define the terms load regulation, line regulation and output resistance for a voltage regulator. (06 Marks)
- 8 a. Briefly explain characteristics of an ideal op-amp and compare with practical op-amp. (10 Marks)  
b. With relevant formulas, neat diagram and wave form explain op-amp Schmitt trigger. (10 Marks)

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