RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College affiliated to University of Calcutta)

B.A./B.Sc. FIRST SEMESTER EXAMINATION, DECEMBER 2015

FIRST YEAR [BATCH 2015-18]

Date : 17/12/2015 **ELECTRONICS [Gen]**

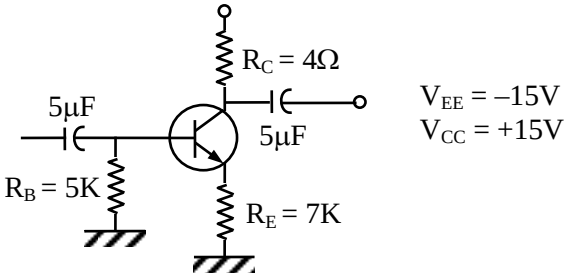
Time : 11 am – 1 pm **Paper :** I Full Marks : 50

Answer **any five** questions :

1. Answer the following questions : [5×2]
   a) Distinguish between clipping and clamping circuit.
   b) Explain diffusion capacitance.
   c) Establish the relation between α & β of a BJT.
   d) What is Mass-Action Law?
   e) What is the principle of working LED?

2. A 230 V, 60Hz voltage is applied to the primary of a 5:1 stepdown, centre tapped transformer used in a Fullwave Rectifier having a load of $900\,\Omega$. If the diode resistance and the secondary coil resistance together has a resistance of $100\,\Omega$, determine— [5×2]
   a) dc Voltage across the load
   b) dc current flowing through the load
   c) dc power delivered to the load
   d) PIV across each diode
   e) Ripple Voltage and its frequency

3. a) Why Bipolar transistors are current operated Devices? [2]
   b) Compare between an "emitter follower' and "Darlington pair' in transistor. [2]
   c) What is the difference between an enhancement type and a depletion type MOSFET. [2]
   d) In the following circuit depicted below, $\beta = 99$ and $V_{BE} = 0{\cdot}7V$. Calculate the quiescent values of I_B, I_C and I_E and V_{CE}. If β increases by 20%, what is the corresponding change in I_C? [3+1]



4. a) What is FET? Show two advantages of FET. [1+2]
   b) Compare between BJT and FET. [2]
   c) Mention the application of FET. [2]
   d) Explain the working principle of N-channel JFET. [3]

5. What is Zener Diode? Mention the application of Zener diode. Compare between Avalanche Break Down with Zener Break Down with a neat diagram. [2+3+5]

6. Analyse the transistor current gain, input impedance, voltage gain and power gain in CE mode using h-parameter model. [10]

7. a) Distinguish between Semiconductor, Conductor and Insulator using Energy band Diagram. [4]
   b) Mention the effects of doping in formation of a semiconductor. [3]
   c) What is PIV? Explain briefly. [2+1]

8. Write short notes on **any two** : [2×5]
   a) Light Emitting Diode
   b) Load Line
   c) Pinchoff Effect
   d) Solar Cell

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