

Roll No. ....

Total No. of Pages : 3

**BT-2/JX**

**8279**

**Elements of Electronics Engg. (2008 onwards)**

**Paper : EL-101E**

Time : Three Hours]

[Maximum Marks : 75

**Note :-** Attempt **FIVE** questions in all. Question No.1 is compulsory ; attempt **FOUR** questions by selecting **ONE** from each Unit.

**1. Compulsory Question.**

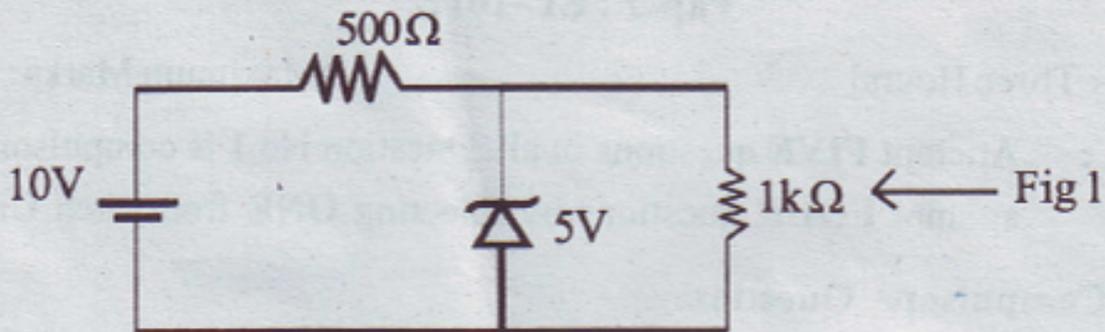
Attempt the following :

- (i) What are intrinsic and extrinsic semi-conductors ? Why semiconductors are said to be materials of negative temperature coefficient of Resistance ?
- (ii) What are advantages of negative feedback in CE-Amplifier ?
- (iii) Why Q-point is chosen at the mid of load line in CE-transistor amplifier ?
- (iv) Why MOSFET have much higher input resistance compared to JFET ? Justify your answer.
- (v) Why a non-invert Op-Amp circuit has very high input resistance compared to inverting Op-Amp circuit ? 15

**UNIT-I**

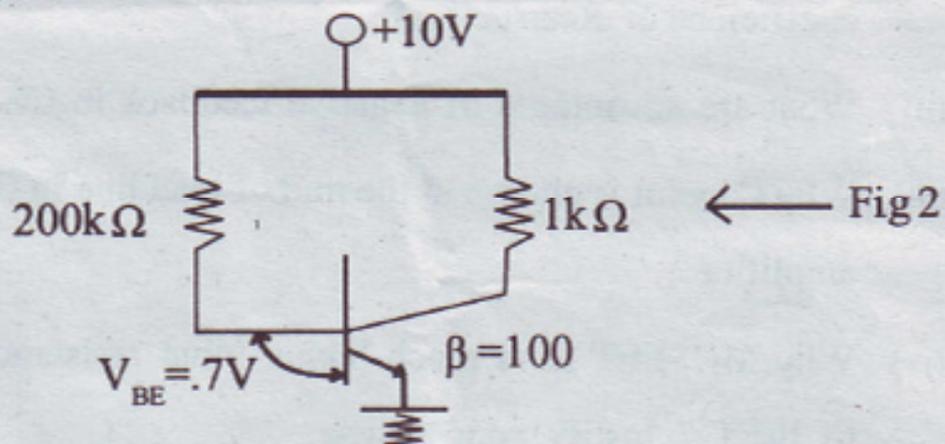
- 2. (a) Discuss the working of capacitance filter connected at the output of a full wave rectifier. 7
- (b) Discuss the advantages of Bridge rectifier over the center tapped full wave rectifier. 8

3. (a) Discuss the working of series and shunt clipping circuit using diodes. 10
- (b) Calculate the power dissipation across the Zener diode in the circuit given below (Fig. 1) 5



## UNIT-II

4. (a) Calculate the Q-point of the transistor circuit given below in Fig. 2 : 5



- (b) Draw a voltage divider biasing based transistor amplifier circuit and explain its superiority over emitter feedback transistor bias circuit. 10
5. (a) Draw a RC coupled oscillator circuit and explain its working. 7
- (b) Compare the three configurations of BJT Amplifier in terms of  $R_i$ ,  $R_o$ ,  $A_v$  and  $A_i$ . 8

## UNIT-III

6. (a) Draw a OPAMP based inverting amplifier circuit and explain how would you obtain its Input resistance and voltage gain. How would you obtain unity gain inverter circuit ? 8
- (b) Explain the working of OPAMP based differentiator circuit and outline its applications. 7
7. (a) Outline the characteristics of an Ideal OPAMP. What do you understand about CMRR and Slew rate of OPAMP ? 8
- (b) What are the limitations of open loop configuration of an OPAMP ? Justify the statement that in a feedback based OPAMP circuit, the inverting and noninverting terminals track each other. 7

## UNIT-IV

8. (a) Discuss the advantages of FET over BJT. 3
- (b) Discuss the static and transfer characteristics of enhance cum depletion MOSFET. 12
9. (a) Outline the applications of SCR and discuss its applications with respect to TRIAC. 5
- (b) When a sensor output is connected to a multistage cascade amplifier, explain why the first stage is preferred with JFET ? 5
- (c) What is difference between Sensor and a Transducer ? 5