

Con. 2744-08.

(REVISED COURSE).

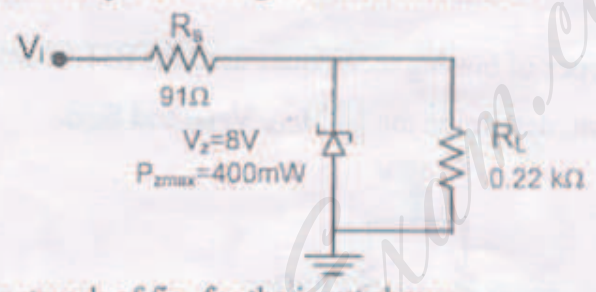
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(3 Hours)

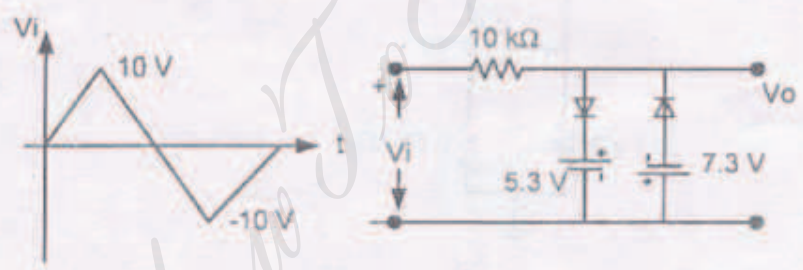
[ Total Marks : 100

- N.B. (1) Question No. 1 is compulsory.  
 (2) Solve any **four** questions from remaining six questions.  
 (3) Assume **suitable** data wherever **required**.

1. a. When a pn-junction is forward biased, the barrier potential is wiped off, why? 04  
 b. Difference between BJT and FET 04  
 c. For the circuit of fig. determine the range of  $V_i$  that will maintain  $V_L$  at 8 V and not exceed the maximum power rating of the Zener diode. 04



- d. Sketch  $V_o$  for the network of fig. for the input shown. 04



- e. Define operating point of transistor. What do you understand by stabilization of operating point? 04

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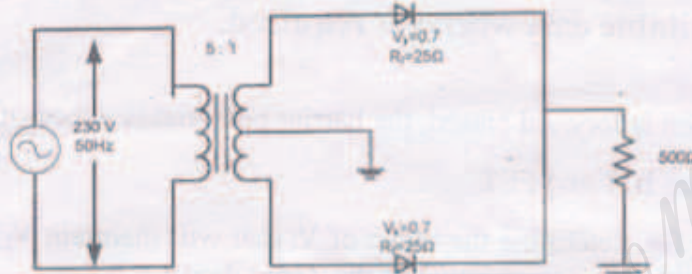
S. E (ETEA) 171 Rev Basic Electronics

Con. 2744-CO-9520-08.

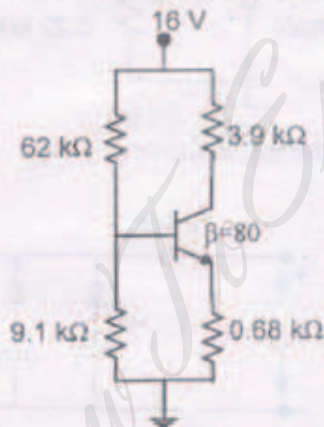
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2. a. Draw the circuit diagram of a capacitor filter with FWR. Derive the expression for ripple factor for such a circuit? 10
- b. For the circuit shown in fig, determine 10
1. d.c. output voltage
  2. Rectification efficiency
  3. PIV
  4. Output frequency.



3. a. Explain different types of biasing techniques used for BJT in detail. 10
- b. For the circuit shown, determine the  $I_{BQ}$ ,  $I_{CQ}$ ,  $V_{CEQ}$  and  $S_{ICQ}$ . 10



4. Design a single stage CE amplifier to meet following specifications:- 20
- $|A_v| \geq 100$ ,  $S=10$ ,  $f_L=20\text{Hz}$ , Use Transistor parameters as  $h_{FE}=h_{fe}=220$ ,  $h_{ie}=2.5\text{k}\Omega$  neglect  $h_{re}$  and  $h_{oe}$ .
5. a. Explain Hall effect and derive the equation for hall coefficient. 10
- b. What is polarization? Explain the types of polarization in details. 10
6. a. Give the methods used for biasing the JFET with operating point values. 08
- b. Design a single Stage CS amplifier for audio frequency range using JFET for the voltage gain of 12. Use JFET parameters as  $I_{DSS}=7\text{mA}$ ,  $V_p=-2.5\text{V}$ ,  $g_{m0}=5600\mu\text{mho}$ ,  $r_d=50\text{k}\Omega$ . 12
7. Write notes on 20
- 1) Types of capacitors
  - 2) Difference between series and shunt regulator.
  - 3) Solar cell and its applications.