

**UNIVERSITY OF PUNE**  
**[4361]-105**  
**F. E. Examination – 2013**  
**BASIC ELECTRONICS ENGINEERING**  
**(2012 Pattern)**

[Time : 2 Hours]

[Max. Marks : 50]

Total No. of Questions : 08

[Total No. of Printed Pages :3]

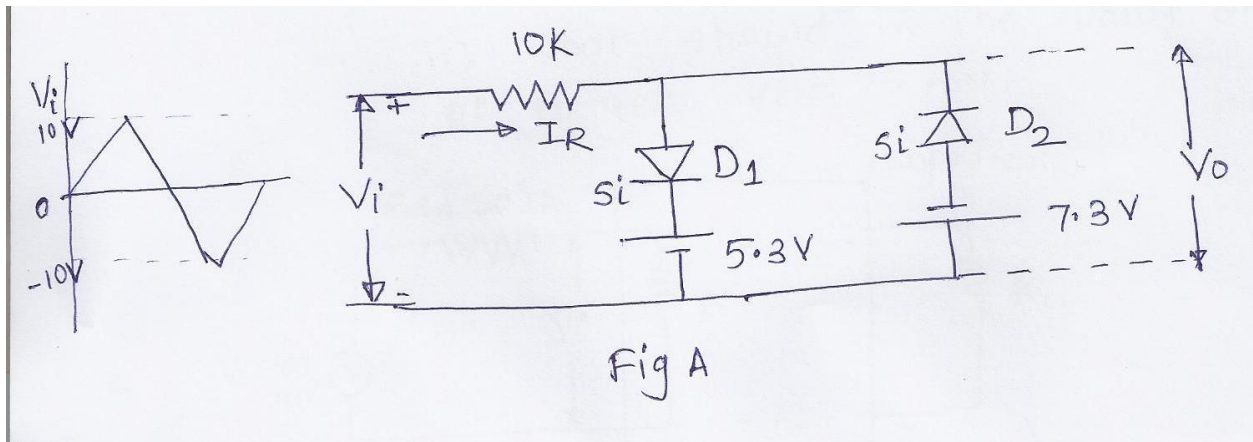
**Instructions :**

- (1) Black figures to the right indicate full marks.
- (2) Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.
- (3) Assume suitable data, if necessary.

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Q1) A) Sketch  $I_R$  and  $V_o$  w. r. t time for the network shown in fig. A. [06]  
Assume both the diodes are silicon type with  $V_f = 0.7$  V



B) For a BJT as a switch why CB and cc configurations are not preferred. [02]

C) Explain how  $R_i$  and  $R_o$  affect the performance of the BJT voltage amplifier. [04]

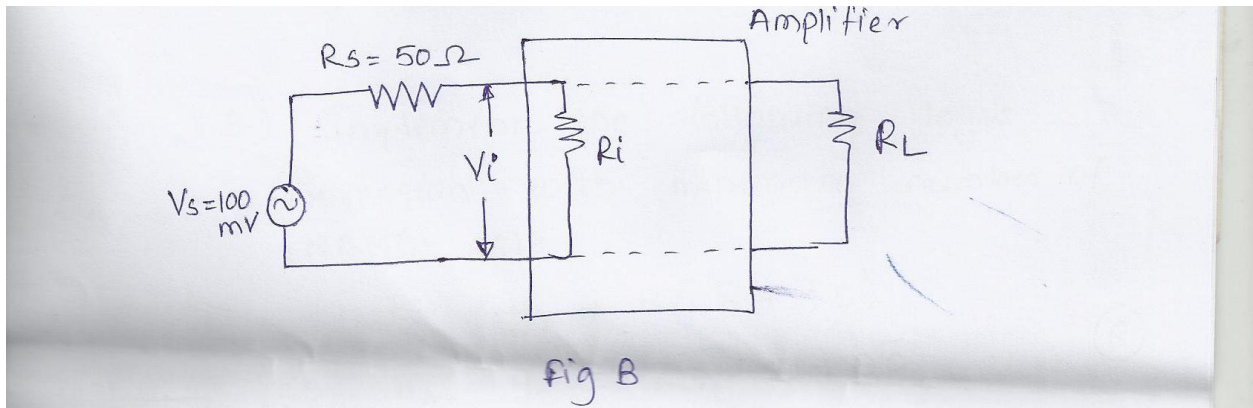
OR

Q2) A) Explain with V-I characteristics the working of zener diode as voltage regulator. [06]

B) In the voltage amplifier shown in Fig B,  $V_s=100\text{mV}$   $R_s=50\ \Omega$  [06]

i) Calculate input voltage  $V_i$  if the input resistance  $R_i$  is  $600\ \Omega$

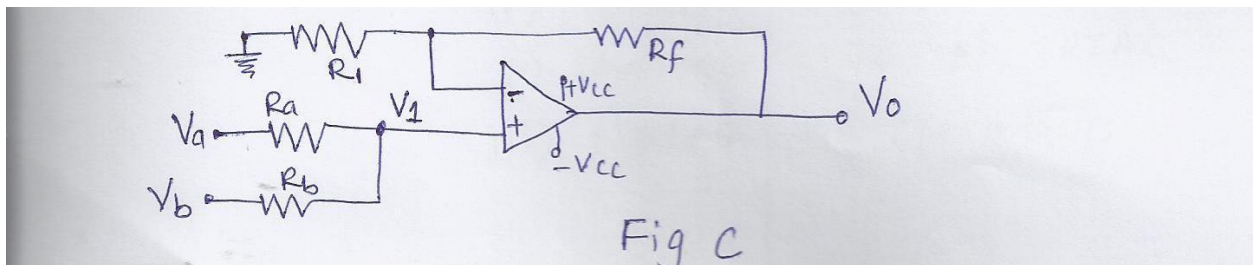
ii) What should be the value of  $R_i$  to get  $V_i = 75\ \text{mV}$



Q3) A) In fig. C if  $V_a = +2\text{V}$   $V_b = +4\text{V}$  [04]

$R_a = R_b = R_1 = 1\ \text{k}\ \Omega$  and  $R_f = 3\ \text{k}\ \Omega$

determine the voltage  $V_1$  at non-inverting terminal of OP-AMP and output voltage  $V_o$



- B) Draw the block diagram of full adder using two half adder, [06]  
explain its working with proper expression for sum and carry  
C) Explain how EX-OR gate can be used as an inverter. [02]

**OR**

- Q4) A) With neat waveform explain IC555 in astable mode. [06]  
B) Implement the following logic expression with minimum [06]  
number of NAND gate.

i)  $y_1 = B (\bar{D} + \bar{C}D)$

ii)  $y_2 = AB + CD + B\bar{C}$

- Q5) A) Explain in detail, the selection criteria for transducer. [06]  
B) Explain in detail [07]  
i) construction of TRIAC  
ii) characteristics of TRIAC  
iii) modes of operation

**OR**

- Q6) A) Explain with block diagram an electronic weighing machine. [06]  
B) Explain the construction of DIAC w.r.t [07]  
i) Characteristics  
ii) Application

- Q7) A) What is the importance of modulation index. Draw the AM [08]  
waveform for  
i) Linear modulation  
ii) Over modulation  
iii) Modulation index = 0

- B) Explain the basic structure of mobile phone system. [05]

**OR**

- Q8) A) With respect to FM explain [08]  
i) Frequency deviation  
ii) Modulation index  
iii) Deviation ratio  
iv) Frequency spectrum of FM  
B) Write a note on co-axial cable and optical fibre cable. [05]