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Total Number of Pages: 02

**B.Tech**  
**BE2101**

**2<sup>nd</sup> Semester Back Examination 2015-16**  
**BASIC ELECTRONICS**

**BRANCH: ALL**

**Time: 3 Hours**

**Max Marks: 70**

**Q.CODE: W458**

**Answer Question No.1 which is compulsory and any five from the rest.**

**The figures in the right hand margin indicate marks.**

**Q1 Answer the following questions:**

**(2 x 10)**

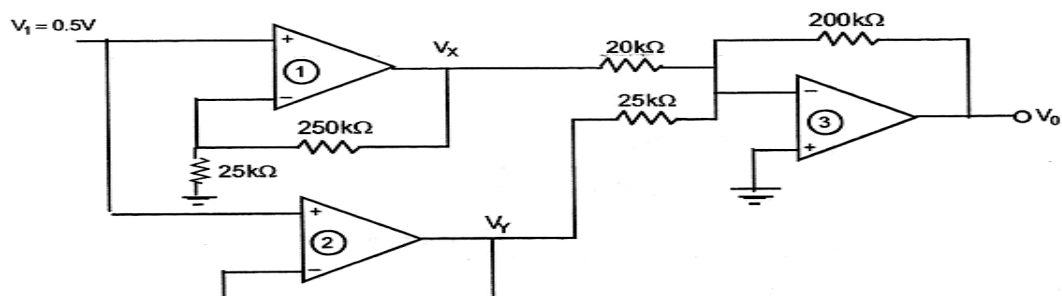
- What is a virtual ground concept in an op-amp?
- Define Bark Hausen criterion?
- Define avalanche break-down voltage & Zener break-down Voltage.
- Distinguish between Self bias and fixed bias circuit.
- A particular logic inverter is specified to have  $V_{IL} = 1.3$  v,  $V_{OL} = 0$ v,  $V_{IH} = 1.7$  v,  $V_{OH} = 3.3$  v. Find the high & low noise Margins  $NM_H$  &  $NM_L$ ?
- Write down the advantages of negative feedback?
- Implement the logic circuit of the following expression  
 $X = A' + BC$  by using NAND gate only.  
 $Y = A'B + C$  by using NOR gate only.
- Define the term thermal runaway in case of transistor.
- Distinguish between Combinational logic circuit & Sequential logic circuit.
- Write down the relationship between  $I_{CO}$  &  $I_{CEO}$ ?

**Q2 a) Explain the input and output characteristics of transistor in CE configuration.**

**(5)**

**b) Calculate the output Voltage  $V_o$  in the following circuit.**

**(5)**



**Q3 a) An amplifier is operating from  $\pm 8$ v power supply. It is supplied with a sinusoidal voltage having 1v peak & gives a sinusoidal voltage o/p of 6v peak to a 1kΩ load. The amplifier receives a current of 7.5 mA from each of this two power supplies. The input current of the amplifier is sinusoidal with 0.2 mA peak.**

**(5)**

Find

Voltage gain

Current gain

Power gain

Power drawn from the dc supply

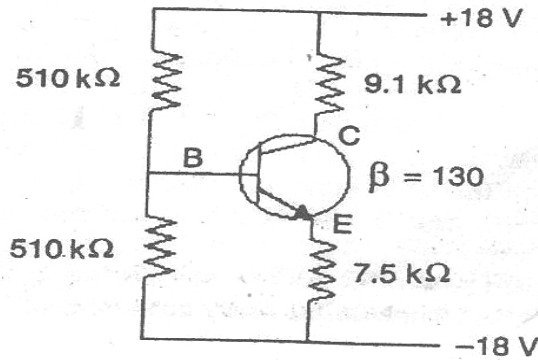
The power dissipated in the amplifier

Amplifier efficiency.

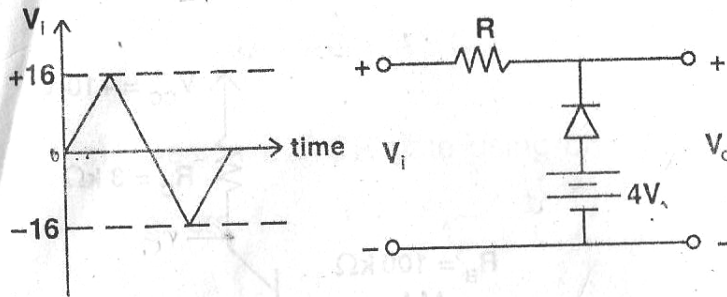
**b) What is a Signal generator? Explain the operation of a Signal generator with necessary block diagram.**

**(5)**

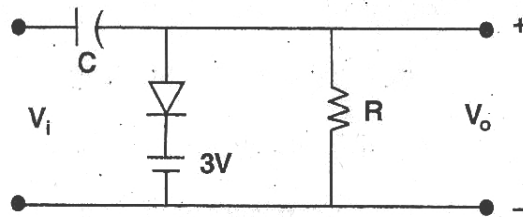
- Q4 a)** Briefly explain about the block diagram of CRO. (5)  
**b)** From the given circuit determine the dc values of  $I_B, I_C, V_{CE}, V_E$  &  $V_B$ . (5)



- Q5 a)** Determine the output voltage  $V_0$  for the following network and draw its output waveform. Assume Silicon diode. (5)



- b)** Draw the output waveform  $V_0$  for the given circuit. Assume  $V_i = 5V$  square wave. What happens to the output waveforms when the diode is reversed? (5)



- Q6 a)** Explain briefly about Center tapped type full wave rectifier and also discuss about the merits & demerits of it. (5)

- b)** A Ge diode carries a current of 10mA when forward bias of 0.2 V is applied. Estimate the reverse saturation current. Calculate the voltage needed for the diode currents of 1 mA. Estimate the reverse saturation current at  $20^\circ$  above the temperature when forward bias voltage of 0.2 V is applied. (5)

- Q7 a)** Which are the gates known as universal gate and why? Also verify the universal properties of NAND gate. (5)

- b)** Implement the following expression by using a 4:1 MUX. (5)  
 $F(A, B, C) = \sum m(1, 2, 6, 7)$

- Q8 Answer the following questions (any two) (5 x 2)**

- a)** Instrumentation amplifier.  
**b)** Ideal Characteristics of op-amp.  
**c)** Crystal oscillator