Printed Pages: 04 **Sub Code: EEC 201**

Paper Id: 131202 **Roll No.**

B.Tech
(SEM II) THEORY EXAMINATION 2017-18
ELECTRONICS ENGINEERING

Time: 3 Hours ***Total Marks: 100***

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. **2 x 10 = 20**

a) Define the terms intrinsic concentration and energy band gap of a semiconductor material.

b) Differentiate between avalanche and zener mechanisms related to zener breakdown.

c) Establish the relationship between I_{CBO} and I_{CEO}.

d) Define the drain to source saturation current of JFET

e) Enlist the characteristics of an ideal operational amplifier (op-amp)

f) Draw the circuit of a subtractor using op-amp and explain its working.

g) Explain the concept of universal gates in Boolean algebra.

h) What are logic gates? Explain the various types of logic gates with the help of logic symbols.

i) What do you understand by Virtual ground in an op-amp?

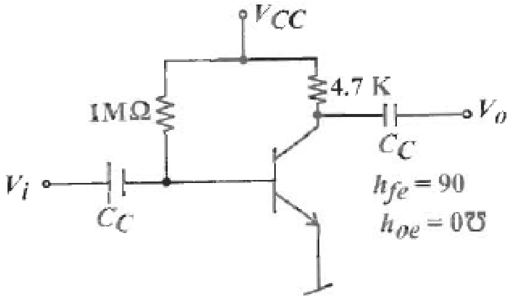
j) What are Lissajous figures? Why they are used?

SECTION B

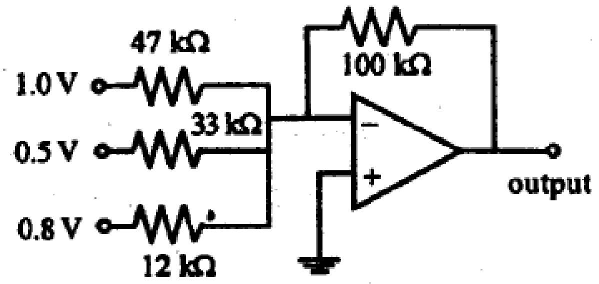
2. Attempt any *three* of the following: **10 x 3 = 30**

a) Define voltage regulation for a rectifier. What are ideal and practical values of voltage regulation for a rectifier? Calculate the voltage regulation for a full wave rectifier.

b) Determine V_{CC} for the following circuit if the Voltage gain $A_v = -200$.



c) Write a short note Op-Amp as adders. Determine the output voltage for the given figure.



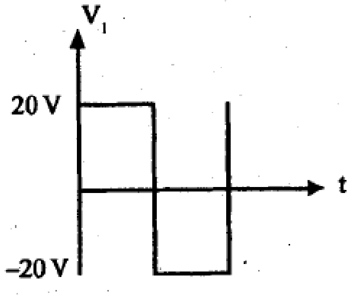
d) What do you understand by number system? Describe the methods for converting an integer number in decimal number system to all other number systems. Use suitable examples.

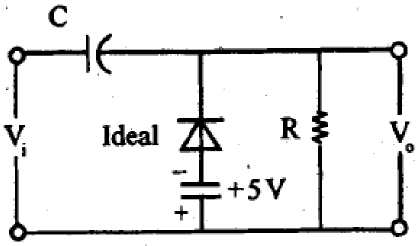
e) Explain the working and characteristic curve of Ramp type digital voltmeter with the help of a neat diagram.

SECTION C

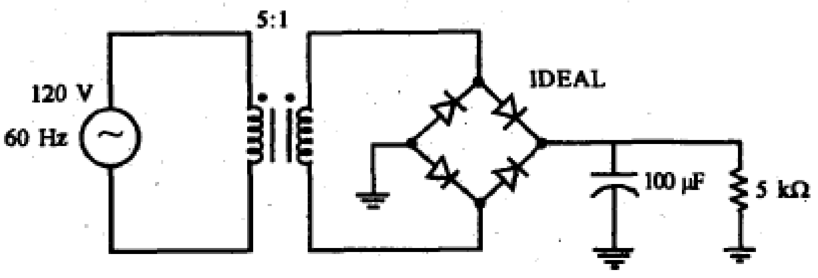
3. Attempt any *one* part of the following: 10 x 1 = 10

(a) Sketch V_O of the following network as shown in Figure.



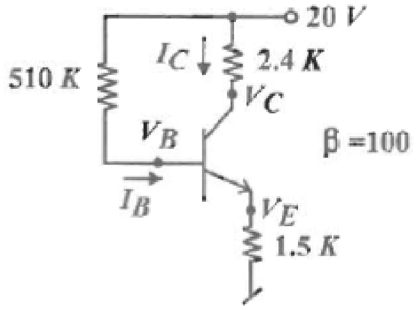


b) Determine the **DC** load voltage and ripple voltage for the circuit as shown in figure.

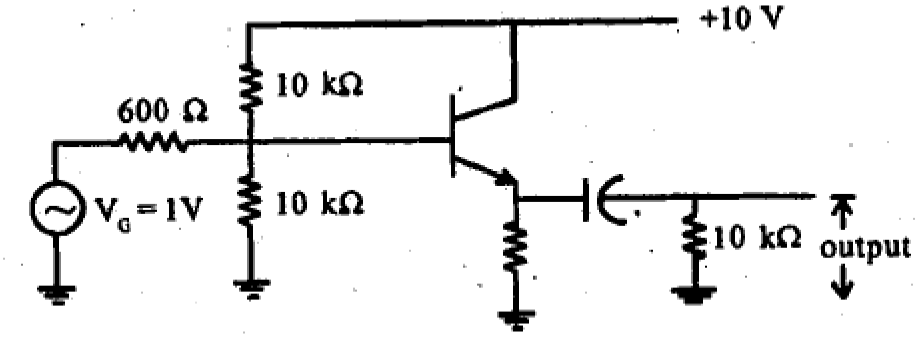


4. Attempt any *one* part of the following: 10 x 1 = 10

(a) Determine I_C, V_E, V_B, V_C and I_B for the following circuit.



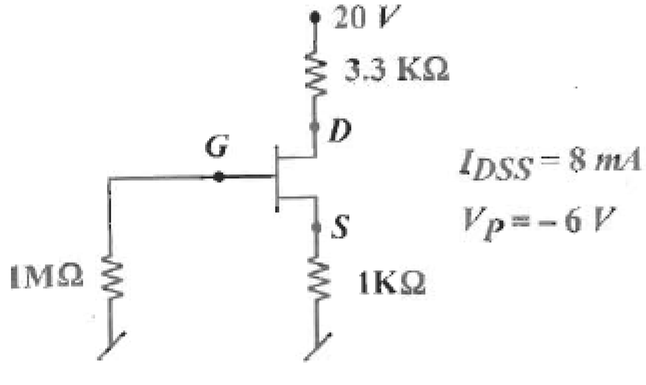
(b) A common collector amplifier has a potential divider bias using $V_{CC} = 10V$, $R_E=4.3k\Omega$, $R_1=R_2=10k\Omega$. Determine the voltage Gain for the following circuit.



5. Attempt any *one* part of the following: 10 x 1 = 10

(a) Distinguish between enhancement type and depletion type MOSFETs. Draw the cross-section of N-channel enhancement type MOSFET. Explain and draw the transfer characteristics.

(b) Determine V_{GS}, I_D, V_{DS}, V_D, V_G and V_S for the following circuit



6. Attempt any *one* part of the following: 10 x 1 = 10

(a) (i) Write the various postulates for the Boolean algebra.

(ii) Convert the following function in to canonical form and express the function as sum of minterms.

$$F(A,B,C,D) = (A'B'D + A'B'C + ADC)$$

(b) (i) Simplify the following Boolean expression using k-map:

$$f(a,b,c,d) = \sum m(5,6,7,10,14,15) + d(9,11)$$

(ii) Simplify the following expression and implement with minimum NAND gate circuit.

$$f(A,B,C)=\overline{A}\overline{B}C+\overline{A}B\overline{C}+\overline{A}BC+A\overline{B}C+AB\overline{C}$$

7. Attempt any *one* part of the following: 10 x 1 = 10

(a) Explain the working of a digital multimeter with the help of a properly labeled block diagram. State some applications of digital multimeter

(b) Describe the procedure for measuring the phase and frequency of an input signal using CRO?