Printed Pages: 03 **Sub Code: EC201**

Paper Id: 131201 **Roll No.** | | | | | | | | | | |

B.TECH.
(SEM IV) THEORY EXAMINATION 2018-19
ELECTRONICS ENGINEERING

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

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

SECTION A

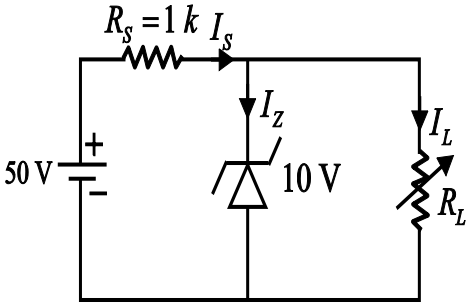
1. Attempt *all* questions in brief. 2 x 10 = 20

a. If V_T=26mV, I_O=1μA, η=1 and V_D=0.3V then determine the value of diode current I_D.
b. Enlist at least two differences between DMOSFET and EMOSFET.
c. List the four specifications of unregulated power supply.
d. What are Lissajous figure?
e. What are the necessary blocks in multimeter for measuring AC voltage ?
f. If CMRR=40dB and A_{CM}=2dB then determine the value of A_D.
g. Give biasing condition of E-B and C-B junction of BJT to operate in an active region.
h. A half wave rectifier is fed from secondary of a transformer whose output voltage is 12.6 V, find out the rectified DC output voltage.
i. What kind of resistances are present in a diode?
j. Draw the PIN diagram of IC 741.

SECTION B

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

a. Explain the working of Digital Voltmeter and Digital Multi Meter giving their block diagram.
b. Explain the formation of depletion region for p-n junction diode. Discuss the effect of biasing and draw its V-I characteristics showing the effect of temperature .
c. Explain Zener diode as a voltage regulator. For the following circuit, determine the range of R_L and I_L such that Zener diode is in breakdown condition. Assume $I_{Z\max} = 32$ mA.



d. Draw the circuit diagram of Op-Amp as Integrator and Differentiator. Also derive the output voltage expression for both.

e. An ac supply of 230 V rms is applied to HWR circuit through transformer having turns ratio $\frac{N_1}{N_2} = \frac{4}{1}$. Assume that the diode is ideal and the load resistance is 300 Ω. Find

(i) DC output voltage. (ii) V_{rms}

(iii) PIV (iv) I_{rms}.

(v) Maximum value of power delivered to the load.

(vi) Average value of power delivered to the load.

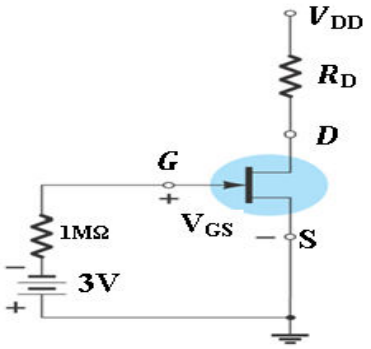
SECTION C

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

(a) Draw and explain the circuit of a full-wave voltage doubler.Also explain briefly the basic function of a filter and also mention its elements.

(b) Explain the working of n-channel JFET with suitable diagram. Also draw its drain and transfer characteristics. For the given circuit, calculate following parameters:

(i) V_{GSQ} (ii) I_{DQ} (iii) V_{DS} (iv) V_S (v) V_D (vi) V_G

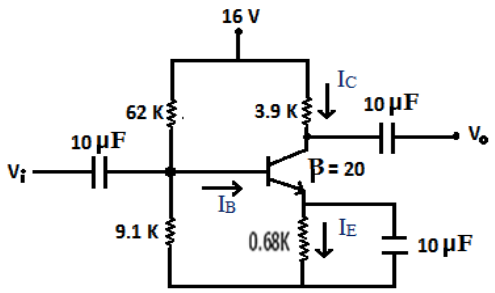


4. Attempt any *one* part of the following: 10 x 1 = 10

(a) Draw the block diagram of CRO and explain the function of each block. How CRO can be used to measure (i) voltage (ii) frequency (iii) phase difference.

(b) Assuming silicon transistor in the given circuit, determine:

(i) I_{BQ} (ii) I_{CQ} (iii) V_{CEQ} (iv) V_E (v)V_C.



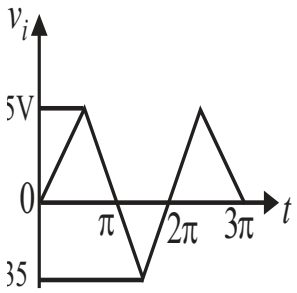
5. Attempt any *one* part of the following: 10 x 1 = 10

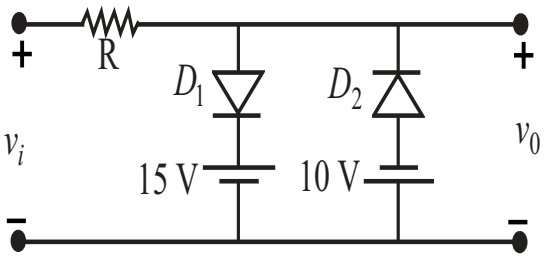
(a) Draw the circuit diagram of difference amplifier using OP-AMP. Derive the expression for its output voltage. Design an inverting amplifier with a gain of -9 and input resistance of 10K ohm.

(b) Draw the CE configuration circuit of NPN transistor and explain its input and output characteristics. Also derive the stability factor S for the emitter bias configuration.

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

(a) Draw and explain the output waveform *for* circuit. Assume that the diodes are Si.





(b) Explain Schottky diode and varactor diode with their applications.

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

(a) Draw and explain the working of bridge rectifier with input and output waveforms. calculate ripple factor and efficiency.

(b) Explain following term

(i) Zero crossing detector using OPAMP
(ii) Buffer amplifier (OPAMP)
(iii) Slew Rate
(iv) CMRR
(v) virtual ground condition
(vi) mobility