PAPER ID-411407

Roll No:

BTECH
(SEM I) THEORY EXAMINATION 2021-22
BASIC ELECTRONICS

Time: 3 Hours   *Total Marks: 70*

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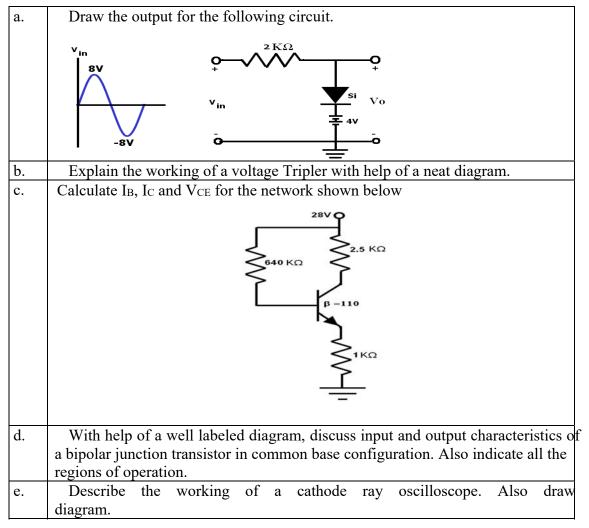
SECTION A

1.   Attempt *all* questions in brief.   2 x 7 = 14

a.	Derive the relation between current amplification factor- alpha (α) and beta (β).
b.	Differentiate between Zener and avalanche breakdown.
c.	Write any two characteristics of an ideal operational amplifier.
d.	What are the advantages of frequency modulation over amplitude modulation?
e.	Differentiate between depletion and enhancement type MOSFET.
f.	Define the term slew rate.
g.	Draw the circuit of Zener diode as voltage regulator.

SECTION B

2.   Attempt any *three* of the following: 7 x 3 = 21

a.	Draw the output for the following circuit.
b.	Explain the working of a voltage Tripler with help of a neat diagram.
c.	Calculate I_B, I_C and V_{CE} for the network shown below
d.	With help of a well labeled diagram, discuss input and output characteristics of a bipolar junction transistor in common base configuration. Also indicate all the regions of operation.
e.	Describe the working of a cathode ray oscilloscope. Also draw its block diagram.

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SECTION C

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

(a)	Describe the construction and working of a depletion type MOSFET. Also draw its transfer characteristics.
(b)	Draw and explain the working principle of center tap full wave rectifier with input and output waveforms. Also derive the expression for rectification efficiency.

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

(a)	Write short note on (a) Tunnel diode (b) Liquid crystal display.
(b)	Discuss digital storage oscilloscope and compare it with an analog oscilloscope.

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

(a)	A 320 W carrier is simultaneously modulated by two audio waves with modulation % of 45 and 60. What is the sideband power radiated?
(b)	Explain the working of operational amplifier as integrator and differentiator.

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

(a)	Discuss in detail the diffusion and transition capacitance of a PN junction diode.
(b)	What do you mean by the term modulation? Why it is needed.

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

(a)	What do you mean by common mode operation of an operational amplifier? Define the terms - input offset voltage and output offset voltage.
(b)	Determine the currents I_1, I_2, and I_{D2} for the network shown below