PAPER ID-310907

**Roll No:** |   |   |   |   |   |   |   |   |   |   |   |   |

# B TECH
## (SEM-III) THEORY EXAMINATION 2020-21
## ELECTRONICS ENGINEERING

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

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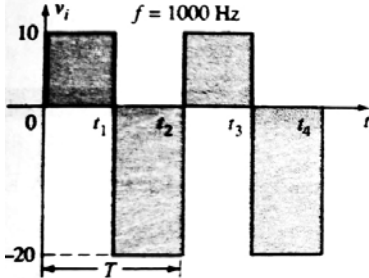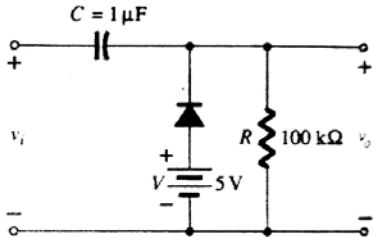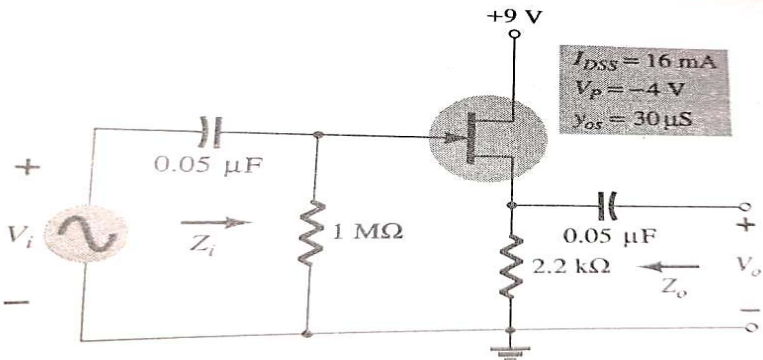
## SECTION A

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

| Q no. | Question | Marks | CO |
|---|---|---|---|
| a. | Compare drift current with diffusion current? | 2 | CO1 |
| b. | State the advantages and disadvantages of LCD. | 2 | CO1 |
| c. | Define ripple factor. List the values of ripple factor for HWR, FWR & Bridge rectifier? | 2 | CO2 |
| d. | What is the significance of using regulator in power supplies? | 2 | CO2 |
| e. | Define pinch off. Why do depletion regions do not touch of pinch off? | 2 | CO3 |
| f. | What do you mean by stability factor? | 2 | CO3 |
| g. | Define input offset voltage. | 2 | CO4 |
| h. | What do you mean by summing amplifier? | 2 | CO4 |
| i. | State the advantages of digital voltmeters. | 2 | CO5 |
| j. | What are the applications of digital multimeter (DMM)? | 2 | CO5 |

## SECTION B

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

| Q no. | Question | Marks | CO |
|---|---|---|---|
| a. | Explain the Concepts of Transition capacitance, Diffusion capacitance with the suitable mathematical expression and diagrams. | 10 | CO1 |
| b. | Determine $v_o$ for the network of figure, for the input indicated.  | 10 | CO2 |
| c. | A dc analysis of the source-follower network of figure results in $V_{GS_Q} = -2.86\,V$ and $I_{D_Q} = 4.56\,mA$ <br> (i) Determine $g_m$ <br> (ii) Find $r_d$ <br> (iii) Determine $Z_i$ <br> (iv) Calculate $Z_o$ with and without $r_d$ <br> (v) Determine $A_v$ with and without $r_d$  | 10 | CO3 |
| d. | Recognise the following circuit and explain it. Also find out expression for $V_o$. Give its advanages and disadvantages. | 10 | CO4 |

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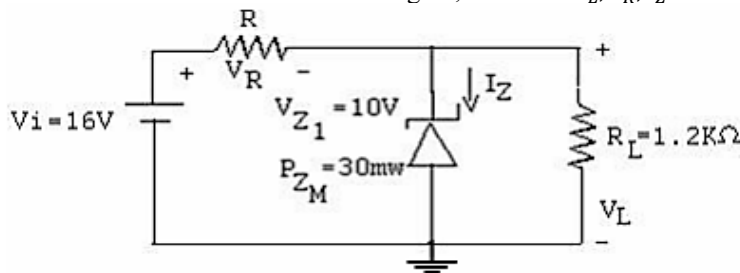| | | Marks | CO |
|---|---|---|---|
| e. | Discuss of digital storage oscilloscope with its block diagram. List out the applications of digital storage oscilloscope. | 10 | CO5 |

**SECTION C**

**3.** **Attempt any *one* part of the following:**

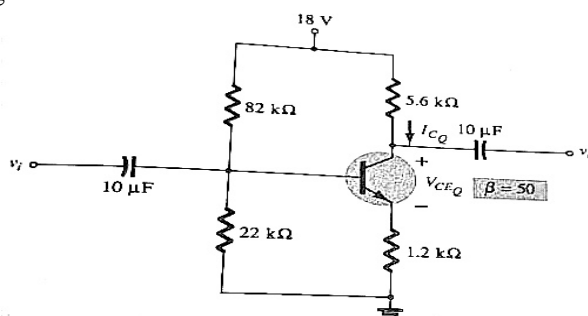| Q no. | Question | Marks | CO |
|---|---|---|---|
| a. | Define Tunneling phenomenon. Explain the principle of operation of operation and characteristics of Tunnel Diode with the help of energy band diagrams. | 10 | CO1 |
| b. | How LED is different with conventional diode? Explain its working principle with suitable diagrams. | 10 | CO1 |

**4.** **Attempt any *one* part of the following:**

| | | | |
|---|---|---|---|
| a. | With a neat circuit diagram and waveforms explain the working of full wave bridge rectifier and show that its ripple factor is 0.48. | 10 | CO2 |
| b. | For the Zener diode circuit shown in figure, determine $V_L, V_R, I_Z$ & $R$ . | 10 | CO2 |



**5.** **Attempt any *one* part of the following:**

| | | | |
|---|---|---|---|
| a. | Draw and explain construction and operation of Enhancement mode MOSFET with its Characteristics? | 10 | CO3 |
| b. | What is the various biasing scheme for BJT? Which one is best among them and why? Determine the DC bias voltage $VCE_Q$ and the current $IcQ$ for the voltage-divider configuration of given figure: | 10 | CO3 |



**6.** **Attempt any *one* part of the following:**

| | | | |
|---|---|---|---|
| a. | What do you mean by inverting amplifier? For the inverting amplifier if the input voltages are $3V, 5V$ and $7V$ and corresponding resistances are $3K\Omega, 5K\Omega$ and $7K\Omega$ respectively and feedback resistor is $5K\Omega$. Calculate the output voltage. | 10 | CO4 |
| b. | Draw the circuit of closed loop differential amplifier using one op-amp. Derive the expression of its output voltage. | 10 | CO4 |

**7.** **Attempt any *one* part of the following:**

| | | | |
|---|---|---|---|
| a. | Explain the following in context of CRO: (i) Sweep time, (ii) Deflection sensitivity, (iii) Vertical and horizontal deflection plates, (iv) Lissajous figure., (v) CRT | 10 | CO5 |
| b. | Explain RAMP type digital multimeters with suitable diagram. How it works State the advantages of ramp type DMM. | 10 | CO5 |