

Time: 3 hours

Max. Marks: 60

- N.B. (1) Question No. 1 is compulsory.
 (2) Attempt any three questions from remaining five questions.
 (3) All questions carry equal marks.
 (4) Assume suitable data, if required and state it clearly.

Q1. Attempt any five.

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- Differentiate between a voltage and power amplifier.
- What is IGBT? Give its applications.
- Compare the center-tapped and bridge full-wave rectifiers
- Define the DC load line for a BJT. Explain how it helps determine the region of operation of the transistor with the help of a collector current (I_c) vs. collector-emitter voltage (V_{ce}) graph.
- Differentiate between Avalanche breakdown and Zener Break down in a diode
- List and explain the applications of power electronic devices in industries and consumer electronics.
- Draw and explain capacitor filter

Q2. a) Explain working of full wave bridge rectifiers with waveforms.

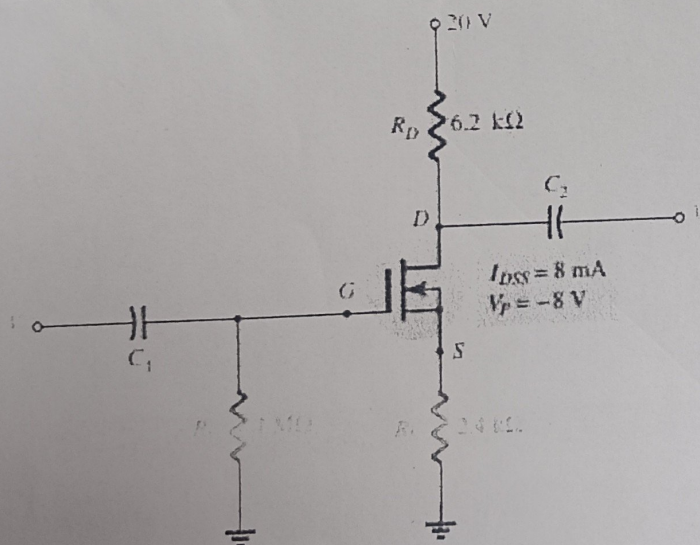
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b) Draw and describe combinational clipper circuits and its characteristics.

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Q3. a) Find I_{DQ} and V_{GSQ}

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b) Explain the analysis of a voltage divider bias circuit for a MOSFET. How does this biasing method improve stability?

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- Q4 a) A MOSFET in a common-source configuration is connected with a drain supply $V_{DD}=12V$ and a drain resistor $R_D=1k\Omega$. Calculate and plot the DC load line. Find the drain current I_D when $V_{DS}=6V$ 8
- b) Discuss Class AB power amplifiers. Explain how Class AB combines the advantages of Class A and Class B amplifiers and state its efficiency and distortion characteristics. 7
- Q5. a) Describe the construction, working, and characteristics of a power MOSFET 7
- b) Derive an expression of Voltage Gain, Input Impedance and Output Impedance for BJT CE amplifier using hybrid- π model 8
- Q6. a) Describe various transistor biasing methods of BJT and derive stability factor for voltage divider bias. 7
- b) Describe the construction and working of SCR. Draw its characteristics.
