

JK LAKSHMIPAT UNIVERSITY, JAIPUR

INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination (Special Back), April-May 2016

B. Tech in Electronics & Communication Engineering, Semester III

Roll No.....

ECE301: ELECTRONIC DEVICES &
CIRCUITS

Time: 3 hours

Max. Marks: 100

Instructions to students:

1. Do not write anything other than your roll number on question paper.
2. Assume suitable data wherever required and mention it clearly.
3. Writing appropriate units, nomenclature, and drawing neat sketches/schematics/ flow chart wherever, required are an integral part of the answer.

Q.1A Objective type multiple choice questions (10 questions @ 1 mark) 10

- i. A silicon diode measures a low value of resistance with the meter leads in both positions.
The trouble, if any, is
 - (a) the diode is open.
 - (b) the diode is shorted to ground.
 - (c) the diode is internally shorted.
 - (d) the diode is working correctly.
- ii. Under normal conditions a diode conducts current when it is
 - (a) Reverse-biased.
 - (b) Forward-biased.
 - (c) Avalanched.
 - (d) Saturated.
- iii. PIV is which of the following?
 - (a) Peak input voltage
 - (b) peak inverse voltage
 - (c) peak immediate voltage
 - (d) positive input voltage
- iv. In Bipolar Junction transistors, the type of configuration which will give both voltage gain and current gain is
 - a) CC
 - b) CB
 - c) CE
 - d) None
- v. A Zener diode is used for
 - (a) Voltage Regulation
 - (b) Rectification
 - (c) Blocking ac and dc
 - (d) None of these



- vi. JFET is:
- Unipolar transistor
 - Bipolar transistor
 - Tristate transistor
 - None
- vii. Which equation is correct for drain current in small signal model:
- $I_D = f(v_{GS}, v_{DS})$
 - $I_D = f(i_{DSS}, v_{DS})$
 - $I_D = f(i_{DSS}, v_{GS})$
 - None of these
- viii. The curve drawn between drain current I_D and drain to source Voltage V_{DS} with gate to source voltage V_{GS} as parameter is:
- Drain characteristics
 - Transfer Characteristics
 - Input characteristics
 - Output characteristics
- ix. Stability in operating point of transistor can be achieved as:
- Stabilization technique
 - Balancing technique
 - compensation technique
 - Both a and c
- x. In the active region, while the collector-base junction is _____-biased, the base-emitter is _____-biased.
- forward, forward
 - forward, reverse.
 - reverse, forward
 - reverse, reverse

Q.2 Short answer type questions (4 questions @ 2.5 marks) 10

- What is the value of base current if the current gain is 100 and collector current is 10mA?
- What is the value of the ac resistance of the emitter diode if the ac voltage across the emitter diode is 1mV and emitter current is 100 μ A?
- Write down the use of a common base amplifier.
- What is semiconductor? Define n-type semiconductor.

Q.3A Write the advantages of transistor, and explain why it is called "Bipolar Transistor"? 05

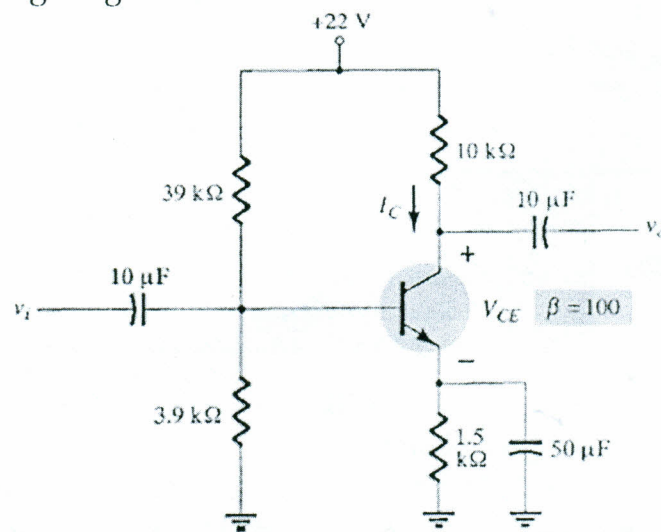
Q.3B If the base current of transistor is 30 μ A when the emitter current is 7.2 mA, what are the values of β and α ? 05

Q.4A State the advantages and disadvantages of FET over BJT. 05

Q.4B Explain Voltage Divider Bias biasing in detail with its circuit. 05

Q.5A Describe the relationship among the base, emitter and collector currents of a bipolar junction transistor. 05

Q.5B Determine the dc bias V_{CE} and the current I_C for the voltage-divider configuration of figure given below. 05



OR

Q.5B A copper wire of 2 mm diameter with conductivity of 5.8×10^7 S/m and electron mobility of 0.0032 m²/V-s is subjected to an electric field of 20 mV/m. Find (i) the charge density of free electrons (ii) the current density (iii) the current flowing in wire (iv) electron drift velocity

Q.6A A JFET has a pinch off voltage of -4 volts and the saturation current of 9 mA. Calculate the drain current if $V_{GS} = -2$ volts. 05

Q.6B Explain biased and unbiased NPN transistor in detail. 05

OR

Q.6B Explain biased and unbiased PNP transistor in detail.

Q.7 Explain the working of center taped full wave rectifier with waveforms. 10

Q.8 Explain the Zener breakdown and avalanche breakdown in pn-junction 10

OR

Q.8 Explain the application of JFET as a voltage regulator.

Q.9 Explain bridge rectifier in detail. 10

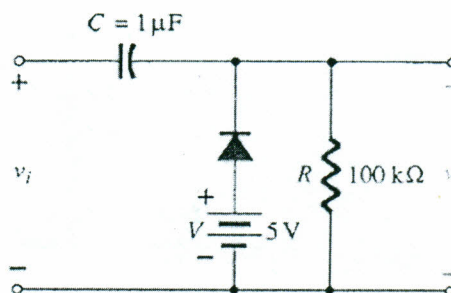
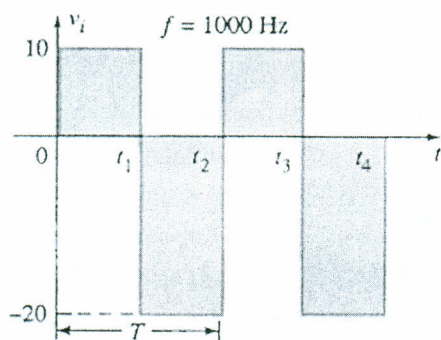
OR

Q.9 Explain any parallel or series clipper circuit in detail.



Q.10 Determine V_o for network given below.

10



OR

Q.10 Determine V_o for network given below.

