

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-III (NEW) EXAMINATION – WINTER 2021****Subject Code:3134104****Date:23-02-2022****Subject Name:Electronic Devices and Circuits****Time:10:30 AM TO 01:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

MARKS

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|------------|--|-----------|
| Q.1 | (a) Explain p and n semiconductor formation in detail. | 03 |
| | (b) Explain the function of LED with neat sketch. | 04 |
| | (c) Draw half wave rectifier circuit. Draw waveform for voltage across diode, diode current with R and RC load | 07 |
| Q.2 | (a) Differentiate between current shunt feedback and voltage shunt feedback. | 03 |
| | (b) Write a short note on Varactor diode. | 04 |
| | (c) Draw Ebers-Moll model and π -model of a transistor. | 07 |
| | OR | |
| | (c) Draw and explain bridge rectifier circuit with capacitor filter. | 07 |
| Q.3 | (a) Explain transistor construction with size and doping level of each region. | 03 |
| | (b) Differentiate FET and BJT. | 04 |
| | (c) Explain how the swamped amplifier works and list three of its advantage | 07 |
| | OR | |
| Q.3 | (a) Draw V-I characteristics of Zener diode | 03 |
| | (b) Explain Transistor as a switch | 04 |
| | (c) Explain Darlington pair in detail. Also derive its current gain. | 07 |
| Q.4 | (a) Draw and explain the input and output characteristics of common emitter configuration. | 03 |
| | (b) Classify the power amplifier based on classes of operation, type of coupling and frequency range. | 04 |
| | (c) Explain the voltage divider bias circuit in detail. | 07 |
| | OR | |
| Q.4 | (a) Explain the Fixed bias circuit in detail. | 03 |
| | (b) Explain the difference of class A and class B operation of an amplifier. | 04 |
| | (c) Explain the T Model of a transistor. | 07 |
| Q.5 | (a) Describe JFET applications as analog switch | 03 |
| | (b) Differentiate Ohmic region and Saturation region of JFET. | 04 |
| | (c) Explain construction, operation and characteristic of P-channel Enhancement type MOSFET in detail. | 07 |
| | OR | |
| Q.5 | (a) Compare E MOSFET with D MOSFET. | 03 |
| | (b) Summarize all four negative feedback amplifier with input output resistance and voltage gain. | 04 |
| | (c) Draw and explain class B push-pull amplifier. | 07 |
