

310606/310506	Roll No. _____	Total No of Pages: <u>2</u>
310606/310506 B. Tech. III - Sem. (Main / Back) Exam., February - 2021 Electrical Engineering 3EE4-06 Analog Electronic Common EE/EEE		

Time: 3 Hours

Maximum Marks: 120

Instructions to Candidates:

Part – A: Short answer questions (up to 25 words) 10×2 marks = 20 marks.
All ten questions are compulsory.

Part – B: Analytical/Problem Solving questions (up to 100 words) 5×8 marks = 40 marks. Candidates have to answer five questions out of seven.

Part – C: Descriptive/Analytical/Problem Solving questions 4×15 marks = 60 marks. Candidates have to answer four questions out of five.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting materials is permitted during examination.
(Mentioned in form No. 205)

1. NIL

2. NIL

PART - A

- ~~Q.1~~ What is PIV of a diode in a rectifier circuit? [2]
- ~~Q.2~~ What is P-N junction diode? Draw its V-I characteristics. [2]
- ~~Q.3~~ What is value of ripple factor for a half wave and full wave rectifier? [2]
- ~~Q.4~~ On the basis of electronic properties, how can you differentiate between Si & GeAs? [2]
- ~~Q.5~~ What are the three – regions of operations of MOS-transistor? [2]
- ~~Q.6~~ Explain why an ordinary transistor is called bipolar. [2]
- ~~Q.7~~ Explain Slew rate and Band – width for Ideal OP-AMP. [2]

- Q.8 Differentiate oscillator and amplifier. [2]
Q.9 What is the Q - point in transistor? [2]
Q.10 Compare the active and passive filters. [2]

PART - B

- Q.1 What do you mean by the peak inverse voltage of the diode? Show that when a capacitor is connected across the load resistance of a half wave rectifier circuit and then the peak inverse voltage of the diode is approximately twice the peak voltage of the input signals. [8]
Q.2 What is Early effect? Explain how it affects the BJT characteristics in CB configuration. [8]
Q.3 Explain Biasing techniques of MOSFETs. [8]
Q.4 What is differential amplifier? Why are differential amplifiers preferred over single ended amplifier? [8]
Q.5 Design a Wien Bridge oscillator that will oscillate at 2 kHz. [8]
Q.6 Draw and explain the operation of a Triangular wave generator. [8]
Q.7 Write a short note on Analog to Digital Conversion. [8]

PART - C

- Q.1 (a) A Si diode has a saturation current of $5 \mu\text{A}$ at room temperature of 300°K . Determine its value at 400°K . [7]
(b) A BJT has a base current of $200 \mu\text{A}$ and emitter current of $20 \mu\text{A}$. Determine collector current and β . [8]
Q.2 (a) Draw the circuit diagram of CE configuration. Sketch the output characteristics and indicate the active, saturation and cut-off region. [8]
(b) Define 'current controlled device' and 'voltage controlled device'. [7]
Q.3 Explain the working of n-channel MOSFET with suitable circuit diagram. What is the difference between enhancement and depletion mode of operation? [15]
Q.4 Draw and explain the working of R-C phase shift oscillator and also derive an expression for its frequency of oscillation. [15]
Q.5 Explain in detail Zero crossing detector. [15]