

310606/310506

Roll No.

Total No. of Pages: 3

**310606/310506**

**B. Tech. III - Sem. (Main) Exam., (Academic Session 2021- 2022)**

**Electrical Engineering**

**3EE4 – 06 Analog Electronics**

**Common EE/EEE**

**Time: 2½ Hours**

**Maximum Marks: 120**  
**Min. Passing Marks:**

**Instructions to Candidates:**

**Part – A:** Short answer questions (up to 25 words)  $6 \times 3$  marks = 18 marks.  
Candidates have to answer **six** questions out of **ten**

**Part – B:** Analytical/Problem solving questions  $3 \times 10$  marks = 30 marks.  
Candidates have to answer **three** questions out of **seven**.

**Part – C:** Descriptive/Analytical/Problem Solving questions  $3 \times 24$  marks = 72 marks.  
Candidates have to answer **three** 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 material is permitted during examination.  
(Mentioned in form No. 205)*

1. NIL

2. NIL

**PART – A**

Q.1 What is Bias? What is the need for biasing?

Q.2 What do you mean by operational amplifier?

Q.3 What do you mean by a zero crossing detector?

Q.4 List the broad classification of ADCs.

- Q.5 What is rectifier efficiency?
- Q.6 What is the need for an instrumentation amplifier?
- Q.7 What do you mean by sample and hold circuit?
- Q.8 Explain the function of peak detector.
- Q.9 Define slew rate and gain-bandwidth product.
- Q.10 What is positive and negative clipping?

### **PART – B**

- Q.1 Explain the internal structure of an operational amplifier with a neat block diagram.
- Q.2 Explain the working of biased clamper with circuit diagram. Write the applications of clampers.
- Q.3 Write the short notes on -
- ✓(A) Square Wave Generator
  - (B) Precision Rectifier
  - ✓(C) Active Filters
- Q.4 Explain the working and V-I characteristics of P-N junction diode.
- Q.5 What is Power Amplifier? In what respects does it differ from a Voltage Amplifier? Why heat sink are needed. <https://www.btubikaner.com>
- Q.6 A Wien Bridge Oscillator circuit is required to generate a sinusoidal waveform of 5,200Hz (5.2kHz). Calculate the values of the frequency determining resistors  $R_1$  &  $R_2$  and the two capacitors  $C_1$  &  $C_2$  to produce the required frequency.
- Q.7 Explain the working of full wave rectifier and differences between full wave and half wave rectifier.

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## PART – C

- Q.1 Draw the circuit diagram of an RC Phase Shift Oscillator and obtain an expression for its frequency of oscillation.
- Q.2 Describe the construction and working principle of n-channel depletion MOSFET. Draw the drain and transfer characteristics of it.
- Q.3 Explain the working principle of voltage regulator with neat circuit diagram.
- Q.4 Write the short notes on -
- (A) P, PI and PID controllers
  - (B) Hysteresis comparator
- Q.5 Explain the structure and I-V characteristics of a BJT with circuit diagram.

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