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Question Paper Code	12339
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**B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2023**

Third Semester

**Electrical and Electronics Engineering  
20EPC301 - ANALOG ELECTRONICS**

(Regulations 2020)

Duration: 3 Hours

Max. Marks: 100

**PART - A (10 × 2 = 20 Marks)**

Answer ALL Questions

- |   | <i>Marks,<br/>K-Level, CO</i> |
|---|-------------------------------|
| 1. Define biasing of BJT.                                   | <i>2,K1,CO1</i>               |
| 2. Compare MOSFET with JFET.                                | <i>2,K2,CO1</i>               |
| 3. Give the Barkhausen criteria for oscillation.            | <i>2,K2,CO2</i>               |
| 4. List out some applications of Class C tuned amplifier.   | <i>2,K1,CO2</i>               |
| 5. State the ideal characteristics of an OP-AMP.            | <i>2,K1,CO3</i>               |
| 6. Draw the circuit configuration for Integrator in Op-Amp. | <i>2,K2,CO3</i>               |
| 7. Interpret the function of Zero crossing Detector.        | <i>2,K2,CO4</i>               |
| 8. Differentiate active and passive clippers.               | <i>2,K2,CO4</i>               |
| 9. Name any three applications of 555 Timer.                | <i>2,K2,CO5</i>               |
| 10. Label the components of variable voltage regulator.     | <i>2,K1,CO5</i>               |

**PART - B (5 × 13 = 65 Marks)**

Answer ALL Questions

11. a) With neat diagram explain the working of Enhancement MOSFET & Depletion MOSFET with its necessary characteristics curve. *13,K2,CO1*
- OR**
- b) Outline the characteristics of FET obtained from the operation by varying  $V_{GS}$ ,  $V_{DS}$  and  $I_D$ . *13,K2,CO1*
12. a) Derive the equation for maximum value of efficiency of Class A Transformer-Coupled amplifier. *13,K3,CO2*
- OR**
- b) Obtain the expression for condition for frequency of oscillation in RC phase shift oscillator and also explain its circuit diagram. *13,K3,CO2*
13. a) Draw the inverting amplifier circuit and non-inverting amplifier circuit of an op-amp in closed loop configuration. Obtain the expression for the closed loop gain for both amplifiers. *13,K4,CO3*

**OR**

- b) For a max frequency of 100 Hz, design a differentiator and adder circuit and draw the frequency response for the same. *13,K4,CO3*

14. a) Illustrate the working of successive approximation type A/D converter with a neat diagram. *13,K3,CO4*

**OR**

- b) Sketch an instrumentation amplifier using 3 Op-Amp and derive its output voltage equation. *13,K3,CO4*

15. a) Discuss the functional diagram of 555 timers and explain its PWM operation. *13,K2,CO1*

**OR**

- b) Explain the operation and working of ICL8038 Function generator IC with its neat sketch. *13,K2,CO1*

**PART - C (1 × 15 = 15 Marks)**

16. a) Model the circuit diagram of class B push pull amplifier and compare it with complementary symmetry amplifier configuration. *15,K5,CO2*

**OR**

- b) Design the circuit diagram of an emitter coupled BJT differential amplifier and derive expressions for differential gain, common mode gain, CMRR, input impedance and output impedance. *15,K5,CO1*