University of Engineering & Management, Kolkata

End Semester Examination, November - December, 2022

Programme Name: B.Tech in CSE/CSE(AIML)/CSE(IOT)/CSBS

Semester: 3rd

Course Name: Analog Electronic Circuits

Course Code: ESCE301

Full Marks: 100 Time: 3 Hours

## Group - A

**Answer 10 questions. Each question carries 2 marks. (2 × 10)**

| | | |
|---|---|---|
| 1.A. | Demonstrate differential amplifier. | 2,CO2,Understand |
| | **Or** | |
| 1.B. | The slope of DC load line will depend on the value of collector resistor. Explain. | 2,CO2,Understand |
| 2.A. | Relate the function of regulation in power supply. | 2,CO2,Understand |
| | **Or** | |
| 2.B. | Explain the parameters cause instability in a Transistor. | 2,CO2,Understand |
| 3.A. | *Explain the names of topologies for negative feedback amplifier.* | 2,CO2,Understand |
| | **Or** | |
| 3.B. | Demonstrate the types of electronic oscillators available. | 2,CO2,Understand |
| 4.A. | Summarize the application of bias point in brief. | 2,CO2,Understand |
| | **Or** | |
| 4.B. | Relate the necessity of Transistor Amplifiers in Electronics. | 2,CO2,Understand |
| 5.A. | Define slew rate of an OPAMP. | 2,CO1,Remember |
| | **Or** | |
| 5.B. | What are the applications of 555 timer? | 2,CO1,Remember |
| 6.A. | Define line regulation in brief. | 2,CO1,Remember |
| | **Or** | |
| 6.B. | List all the basic amplifiers in feedback topologies. | 2,CO1,Remember |
| 7.A. | Define the Purpose of Filters in a circuit. | 2,CO1,Remember |
| | **Or** | |

| | | |
|---|---|---|
| 7.B. | State the Barkhausen criterion for oscillation. | 2,CO1,Remember |
| 8.A. | Explain the full form of Current gain in amplifier. | 2,CO1,Remember |
| | **Or** | |
| 8.B. | Explain the full form of Voltage gain in amplifier. | 2,CO1,Remember |
| 9.A. | Describe the riple factor of a Half wave rectifier. | 2,CO1,Remember |
| | **Or** | |
| 9.B. | State the types of feedback amplifier. | 2,CO1,Remember |
| 10.A. | Sketch the applications of oscillators. | 2,CO3,Apply |
| | **Or** | |
| 10.B. | Illustrate Multivibrator. | 2,CO3,Apply |

## Group - B

**Answer 8 questions. Each question carries 5 marks.** $(5 \times 8)$

| | | |
|---|---|---|
| 11.A. | Reframe the Advantages of RC Coupled Amplifier. | 5,CO5,Evaluate |
| | **Or** | |
| 11.B. | Evaluate Input Bias Current. | 5,CO5,Evaluate |
| 12.A. | Judge why is 555 timer called so. | 5,CO5,Evaluate |
| | **Or** | |
| 12.B. | Evaluate the meaning of Feedback fraction. | 5,CO5,Evaluate |
| 13.A. | Discuss where 555 timer is used. | 5,CO4,Analyze |
| | **Or** | |
| 13.B. | Illustrate the operation of Load Line. | 5,CO4,Analyze |
| 14.A. | Analyze the types of feedbacks present in amplifier. | 5,CO4,Analyze |
| | **Or** | |
| 14.B. | Categorize positive and negative IC regulators. | 5,CO4,Analyze |
| 15.A. | Show the operation of Series and Shunt feedbacks in amplifier. | 5,CO4,Analyze |
| | **Or** | |
| 15.B. | Demonstrate a feedback Amplifier. | 5,CO4,Analyze |
| 16.A. | Sketch the frequency response plot of an RC coupled amplifier and explain the same. | 5,CO3,Apply |
| | **Or** | |
| 16.B. | Show that total gain is equal to the product of gains of individual stages in a multi-stage amplifier. | 5,CO3,Apply |

17.A. Formulate the key components required in making an oscillator. **5,CO6,Create**

**Or**

17.B. Asseses the Transfer Characteristics curve of Op Amp. **5,CO6,Create**

18.A. Classify Time Constant? Define its importance. **5,CO5,Evaluate**

**Or**

18.B. Reframe the disadvantages of RC Coupled Amplifier. **5,CO5,Evaluate**

## Group - C

**Answer 4 questions. Each question carries 10 marks. (10 × 4)**

19.A. Design and explain RC coupled amplifier. Sketch a typical frequency response curve. Explain the salient points in it. **10,CO6,Create**

**Or**

19.B. Compile how op-amp can be used as a differentiator. **10,CO6,Create**

20.A. Reframe mathematically the ripple factor of a half wave rectifier is 1.21 and full wave rectifier is .48 **10,CO5,Evaluate**

**Or**

20.B. Explain the block diagram of op-amp. asses the op amp as an Integrator circuit. **10,CO5,Evaluate**

21.A. Classify the reason why voltage divider bias or self bias is better compare to another biasing technique with proper calculation. **10,CO4,Analyze**

**Or**

21.B. Explain the operation of crystal oscillator. **10,CO4,Analyze**

22.A. Show, the reason for fixing the operating point in the middle of the load line. also explain how amplification works in Transistor. **10,CO3,Apply**

**Or**

22.B. Sketch and explain full wave center tapped rectifier circuit. show the operation of bridge rectifier. **10,CO3,Apply**

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