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Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

Third Semester B.Tech Degree (S,FE) Examination January 2022 (2015 Scheme)

**Course Code: EC209**

**Course Name: ANALOG ELECTRONICS (MC)**

Max. Marks: 100

Duration: 3 Hours

**PART A**

*Answer all the questions, each carries 5 marks.*

Marks

- |   |   |     |
|---|---|-----|
| 1 | Explain the piece wise linear model of a diode with 0.7v.         | (5) |
| 2 | Mention the advantages and disadvantages of a negative feedback.  | (5) |
| 3 | What are cascaded amplifiers? Explain it.                         | (5) |
| 4 | Write a note on Darlington pairs.                                 | (5) |
| 5 | State and prove Barkhausen criteria.                              | (5) |
| 6 | Elaborate on the tank circuit of Hartley and Colpitts oscillator. | (5) |
| 7 | Define the terms free running, capture and lock range in PLL.     | (5) |
| 8 | Briefly explain 555 timer circuit.                                | (5) |

**PART B**

*Answer any three questions, each carries 10 marks.*

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|----|--|------|
| 9  | a) Draw the VI characteristics of Zener diode and explain its usage in a voltage regulator.                          | (10) |
| 10 | a) Elaborate the h-parameter two port model of a bipolar junction transistor.  | (10) |
| 11 | a) Why are FET called 'voltage controlled transistor'? Explain this concept in JFET.                                 | (10) |
| 12 | a) Which power amplifier has the highest efficiency? Analyse its efficiency using necessary equations and waveforms. | (10) |
| 13 | a) Distinguish single level clipper from a double level clipper.   | (5)  |
|    | b) Discuss the circuit diagram and waveform of negative and positive clampers.                                       | (5)  |

**PART C**

*Answer any two questions, each carries 15 marks.*

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| 14 | a) Elucidate the working of RC phase shift Oscillator with a neat circuit diagram. | (8) |
|    | b) Derive an equation for frequency of oscillations of RC phase shift oscillator.  | (7) |

- 15 a) Why are astable multivibrators called free running multivibrators? Justify your answer with circuit diagram using op-amp and waveform. (10)
- b) Obtain an expression to calculate the time constant for astable multivibrator using op-amp. (5)
- 16 a) Differentiate between online and offline UPS with block diagram. (5)
- b) Explain the construction and working of a UJT oscillator. (10)
- 17 a) List out the significance of PLL. Describe its block diagram. (9)
- b) Illustrate any one application of PLL. (6)

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