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Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Seventh Semester B.Tech Degree (S, FE) Examination May 2024 (2015 Scheme)



Course Code: EE465

Course Name: Power Quality

Max. Marks: 100

Duration: 3 Hours

PART A

Answer all questions, each carries 5 marks.

Marks

- | | | |
|---|--|-----|
| 1 | Mention the major reasons for the growing concern about the quality of electric power by both utilities and end users. | (5) |
| 2 | Discuss any two sources of harmonics | (5) |
| 3 | Illustrate how FFT can be used for harmonic analysis. | (5) |
| 4 | Enumerate the factors to be considered for choosing the power quality monitoring locations. | (5) |
| 5 | With neat diagram, explain the working of a series active filter. | (5) |
| 6 | Discuss the limitations of passive filters | (5) |
| 7 | Explain power frequency fields. | (5) |
| 8 | Mention any two power quality issues of grid connected renewable energy sources | (5) |

PART B

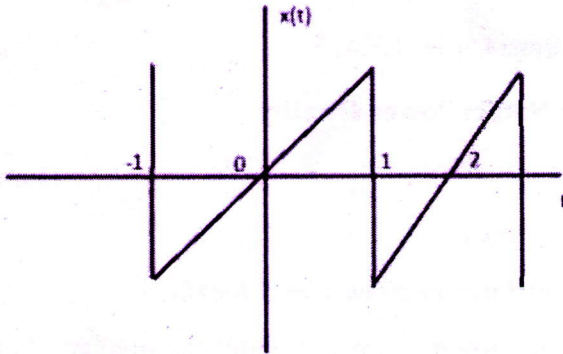
Answer any two full questions, each carries 10 marks.

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|----|---|------|
| 9 | Define waveform distortion. Explain the waveform distortion categories | (10) |
| 10 | a) Explain the various long duration voltage variations. | (5) |
| | b) Discuss briefly with suitable waveform the mechanism of harmonic generation | (5) |
| 11 | A three phase purely resistive load of 50 kW rating is supplied directly from a 50 Hz three phase 415 V bus. At the time of measuring, the load was consuming 41.5 kW and the voltage waveform contained 11 V of fifth harmonic and 8V of seventh harmonic. Find THD and TDD assuming that the load resistance varies with the square root of harmonic order h. | (10) |

PART C

Answer any two full questions, each carries 10 marks.

- 12 Find the amplitude of the 3rd harmonic of given waveform using fourier series technique. Peak value is unity. (10)



- 13 a) Obtain the magnitude and phase angle of second order harmonic of the given signal using DFT: $x(n) = \{2, 0, 0, 1\}$ (5)
 b) Write short note on Power line disturbance analyzer (5)
- 14 What are the major power quality monitoring considerations? (10)

PART D

Answer any two full questions, each carries 10 marks.

- 15 With neat diagram, explain the various configurations of a hybrid active filter. (10)
- 16 a) Comment on the role of filters in harmonic elimination process.. (5)
 b) Distinguish between conducted emission and radiated emission (5)
- 17 Describe the working of any two Power Quality Conditioners for Smart Grid. (10)
