SLR-TC – 427

Seat No.	

Set P

B.E. (Electrical Engineering) (Part – II) (New CGPA) Examination, 2018
POWER QUALITY (Elective – II)

Day and Date : Tuesday, 22-5-2018 Max. Marks : 70
Time : 2.30 p.m. to 5.30 p.m.

***Instructions** : 1) Q. No. **1** is **compulsory**. It should be solved in **first 30 minutes** in Answer Book Page No. **3**. **Each** question carries **one** mark.*

*2) **Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.***

MCQ/Objective Type Questions

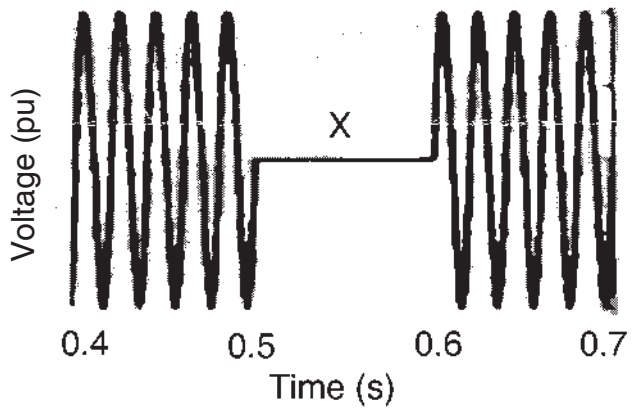
Duration : 30 Minutes Marks : 14

1. Choose the correct answer : **(14×1=14)**

1) Most common cause of unbalancing is
   a) Single phase loads b) Three phase loads
   c) Arc furnace d) ASDs

2) Starting of induction motor usually results to
   a) Sag b) Swell c) Transients d) Flicker

3) Part of a sine wave marked X represents



   a) Harmonics b) Sag
   c) Momentary interruption d) Sustained interruption

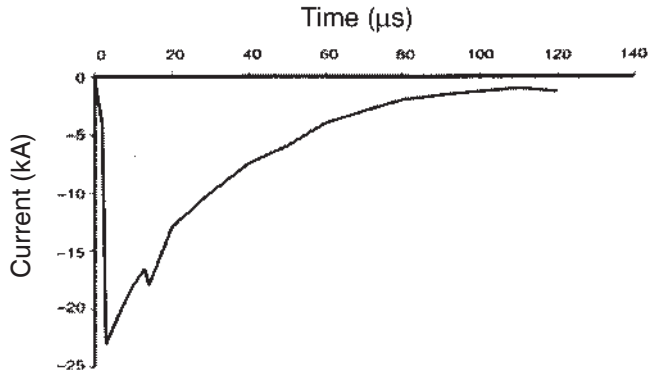
4) The duration of voltage sag can be
   a) Less than a minute b) Several hours
   c) Several minutes d) Not defined

P.T.O.

5) Which surge arrester is also known as gapless arrester ?
   a) SiC arrester b) ZnO arrester c) Both a) and b) d) None of these

6) Power system faults can result to
   a) Sags b) Swells
   c) Both sag and swell d) None of the above

7) Following waveform represents



   a) Harmonics b) Impulsive transient
   c) Oscillatory transient d) Flicker

8) IEEE standard 519 is related to
   a) Power Quality monitoring b) Flicker
   c) Harmonics d) Grounding

9) If fundamental frequency is 50 Hz. Then frequency of 25 Hz can be considered as
   a) Harmonics b) Subharmonics
   c) Interharmonics d) None of the above

10) Shunt passive filter provides _____ impedance path at the tuned frequency.
   a) Low b) Can't predict c) High d) None of these

11) Series passive filters are used for mitigation of _____ harmonics.
   a) Current b) Voltage c) Power d) None of these

12) There should be _____ neutral to ground bond in the system.
   a) Two b) Three c) Only one d) Any number

13) Which of the following is not objective of power quality monitoring ?
   a) To characterize system performance
   b) To characterize specific problems
   c) To do predictive maintenance
   d) To perform stability study

14) High frequency power quality events usually last for _____ duration.
   a) Short b) Long c) Can't predict d) None of these

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B.E. (Electrical Engineering) (Part – II) (New CGPA) Examination, 2018
POWER QUALITY (Elective – II)

Day and Date : Tuesday, 22-5-2018 Marks : 56
Time : 2.30 p.m. to 5.30 p.m.

SECTION – I

2. Solve **any four** questions : **(4×4=16)**
   1) Define power quality. Why power quality is important now a day ? Explain in brief.
   2) With neat diagram, define and explain the causes and effects of unbalance.
   3) Explain the need of power quality standards. Explain power quality standards.
   4) Explain various causes of transient overvoltage in a power system.
   5) Explain different methods of preventing fault.

3. Solve **any two** questions : **(2×6=12)**
   1) Explain with neat diagram working of following equipments :
      a) Online UPS.
      b) Dynamic Voltage Restorer (DVR).
   2) With neat diagram explain CBEMA and ITIC curve.
   3) Define, explain the causes and effects of the following power quality problems :
      a) Overvoltage b) Flicker.

SECTION – II

4. Solve **any four** questions : **(4×4=16)**
   1) Define following terms :
      a) Displacement power factor.
      b) True power factor.
   2) Define and write equation of following harmonic indices :
      a) Individual Harmonic Distortion.
      b) Total Harmonic Distortion.
      c) Total Demand Distortion.

3) Explain various effects of harmonics in a power system.

4) 12 pulse PWM variable speed drive has following specifications :

Output : 0 to 250 V, 0-150 Hz, 10A, 6 KVA

Harmonic spectrum for the drive is as given in the table :

Order	1	3	11	13	15	17	23	25	35	37
Angle (Degree)	0°	60°	52°	–34°	163°	45°	67°	–96°	15°	67°
Magnitude r.m.s.% of fundamental	100	9	40	30	6	20	15	3	10	8

Calculate total harmonic distortion in current.

5) Define power quality monitoring. Enlist various power quality monitoring equipments.

5. Solve **any two** questions : **(2×6=12)**

1) a) With neat diagram explain why triplen harmonics become an important issue for grounded-wye systems with current flowing on the neutral.

b) With neat diagram explain the flow of triplen harmonic current in a star-star and star-delta connected transformer.

2) Define grounding. Explain reasons of grounding. Explain different problems associated with wiring and grounding.

3) Explain with neat diagram operation of shunt active filter and series passive filter used for harmonic mitigation.

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