

6E3115

B.Tech. VI Sem. (Main/Back) Exam, May/June-2014

Electrical Engineering

**6EE6.2 POWER SYSTEM INSTRUMENTATION**

Time: 3 Hours

Maximum Marks: 80

Min. Passing Marks: 24

**Instructions to Candidates:**

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly.

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.

1. \_\_\_\_\_ 2. \_\_\_\_\_

**Unit-I**

- Q.1 (a) The following 10 observations were recorded when measuring a voltage 41.7, 42.0, 41.8, 42.0, 42.1, 41.9, 42.0, 41.9, 42.5, 41.8.

Find: [8]

(i) Probable error of one reading.

(ii) Standard deviation.

- (b) Define the following for Gaussian distribution of data: [8]

(i) Precision index

(ii) Standard deviation of mean.

**OR**

- Q.1 (a) A circuit was tuned for resonance by eight different students and the values of resonant frequency in KHz were recorded as 432, 447, 444, 435, 446, 444, 436 and 441. calculate. [8]

(i) Standard deviation

(ii) Variance.

**P.12**

[8]

(b) Define the following with suitable examples:

- (i) Systematic errors.
- (ii) Random errors.

**UNIT-II**

[8]

**Q.2** (a) Explain the following characteristics of transducers:

- (i) Input characteristics.
- (ii) Transfer characteristics.

(b) Explain the Construction and working principle of K-type thermocouple.

[8]

**OR**

[8]

**Q.2** (a) Explain the following with suitable diagrams:

- (i) Bourden tubes.
- (ii) Bellows

(b) Explain the construction and working principle of seismic accelerators with suitable examples.

[8]

**UNIT-III**

**Q.3** (a) Explain the working principle of function generator with block diagram.

[8]

(b) Explain the importance of sample and hold circuit with suitable diagrams.

[8]

**OR**

**Q.3** (a) Explain the working of frequency to voltage converters.

[8]

(b) Discuss about the shielding and grounding circuit with suitable applications, advantages and disadvantages.

[8]

**UNIT-IV**

**Q.4** (a) What do you mean by power factor. Explain the method of measurement of power factor.

[8]

(b) Discuss about the active and reactive Power in the different plants.

[8]

**OR**

**Q.4** (a) Explain the working principle of single phase induction type energy meter.

[8]

(b) Discuss about the various methods of phase angle and frequency measurements with neat sketches.

[8]

**UNIT-V**

- Q.5 Write short notes on the following:
- (a) Capacitive voltage transformers. [8]
  - (b) Transient performance of C.T. [8]

**OR**

- Q.5 Write the short notes on the following: [8]
- (a) Wilson compensation method for reduction of errors in current transformers.
  - (b) Protection circuits of current transformers. [8]

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