Reg. No. :
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# **Question Paper Code: 41345**

## B.E. / B.Tech. DEGREE EXAMINATION, NOV 2016

Fourth Semester

Electrical and Electronics Engineering

## 01UEE405 - ELECTRICAL MEASUREMENTS AND INSTRUMENTATION

(Regulation 2013)

Duration: Three hours

Answer ALL Questions.

Maximum: 100 Marks

PART A - (10 x 2 = 20 Marks)

- 1. How are the absolute and relative errors expressed mathematically?
- 2. Define static error and reproducibility.
- 3. List the possible causes of errors in moving iron instruments.
- 4. Define burden of an Instrument transformer.
- 5. Write the two conditions to be satisfied to make an AC bridge balance.
- 6. List the sources of electrostatic interference.
- 7. What is meant by drop out?
- 8. What are the functions of data logger?
- 9. Brief the need of sample and hold circuit in analog to digital converter.
- 10. What are optical detectors?

## PART - B (5 x 16 = 80 Marks)

- 11. (a) (i) The output voltage of an audio amplifier is 10V and 4V when delivering a power of 25W and 16W find open circuit voltage and output resistance of the amplifier. What is the maximum power that the amplifier will give? (8)
  - (ii) Explain how "method of least squares" can be used to find best linear function for given variable x and y.(8)

- (b) (i) 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, and 41.8 volt. Find (1) the mean (2) the standard deviation (3) range (8)
  - (ii) What is standard? Classify the standards of measurement (8)
- 12. (a) (i) How the range of DC ammeter and DC voltmeter can be extended? Derive the expressions to calculate shunt resistance and multiplier resistance. (8)
  - (ii) With a neat diagram, explain the construction, working principle of single phaseWattmeter. What is the importance of deflection torque in these instruments? (8)

### Or

- (b) With circuit and phasor diagram explain the measurement of power using instrument transformer. (16)
- 13. (a) (i) Explain in detail about laboratory type DC potentiometer. (8)
  - (ii) Explain how inductance is measured by using Maxwell's bridge. (8)

#### Or

- (b) (i) Describe about the multiple earth and earth loops. (8)
  - (ii) Explain the grounding techniques in detail to reduce the ground loop interference signal.
- 14. (a) Describe basic components of magnetic tape recorder used for instrumentation applications using direct recording techniques and discuss its advantages and disadvantages. (16)

### Or

	(b)	(i)	Explain the block diagram of a general purpose oscilloscope and also	describe
			about the observation of waveform on CRO.	(10)
		(ii)	Explain with a neat sketch about Dot matrix display.	(6)
15.	(a)	(i)	Explain the resistive transducer with respective to potentiometer.	(4)
		(ii)	Explain the capacitive transducer.	(6)
		(iii)	) Describe the piezoelectric transducer and give the formula for coefficient.	coupling (6)

### Or

(b) Explain the working principle of piezoelectric transducer with neat sketch. (16)