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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Fourth Semester B.Tech Degree (S,FE) Examination June 2022 (2015 scheme)

Course Code: EE208

Course Name: MEASUREMENTS AND INSTRUMENTATION (EE)

Max. Marks: 100 Duration: 3 Hours

PART A

Answer all questions, each carries 5 marks Marks

1		Describe the various operating forces needed for proper operation of an analog indicating instrument.	5
2		Explain the measurement of earth resistance using fall of potential method.	5
3		Write short notes on Phasor Measurement Units.	5
4		Explain the measurement of flux density in an iron ring specimen.	5
5		How capacitance is measured using a Schering bridge?	5
6		What are the applications of cathode ray oscilloscope?	5
7		Explain the construction and working of an LVDT.	5
8		How liquid level is measured using a transducer?	5

PART B

Answer any two questions, each carries 10 marks

9	a)	With figure explain the construction and working of attraction type moving iron instruments.	6
	b)	Explain systematic errors present in instruments.	4
10	a)	List any five effects produced by current and voltage which are utilized for the operation of analog instruments. Give examples of instruments that depend on these effects.	5
	b)	Explain the working of electronic energymeter	5
11	a)	List the general requirements for a material to be used as an ammeter shunt. Derive expressions for resistances of different sections of a universal shunt used for a 3 range ammeter.	5
	b)	A wattmeter is rated at 10A and 25V. The current coil has a resistance of 0.06Ω and a reactance of 0.02Ω. The potential coil circuit may be assumed to be purely	5

resistive having a resistance of 6250Ω. Find the error due to the two different connections (when pressure coil (i) is at input side (ii) is at the load side). The load is 10A at a power factor of 0.174 lagging. The voltage across the load is 25V.

PART C

Answer any two questions, each carries 10 marks

12 a) A current transformer with a bar primary has 300 turns in its secondary winding. The resistance and reactance of the secondary circuit are 1.5Ω and 1Ω respectively including the transformer winding. With 5A flowing in the secondary winding, the magnetising mmf is 100A and the iron loss is 1.2 watts. Determine the ratio error.(Assume nominal ratio to be equal to the turns ratio) 7

b) Define transformation ratio, nominal ratio and turns ratio of a potential transformer 3

13 a) Describe the Lloyd Fisher square for measurement of iron losses in a specimen of laminations. 5

b) Explain the measurement of rotational speed using proximity sensor. 5

14 a) Illustrate with figure, how a Hall effect sensor measures high d.c. currents? 5

b) Describe the method for determination of B-H curve of a magnetic material using step by step method. 5

PART D

Answer any two questions, each carries 10 marks

15 Explain how the following measurements can be made with the use of a CRO: 10
(i) Phase angle (ii) Frequency

16 a) How frequency is measured using a Wien bridge. 5

b) What are the main components of an analog data acquisition system? 5

17 a) How temperature is measured using thermocouples? 5

b) How flow is measured using an electromagnetic flow meter. 5

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