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Pages: 2

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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S3 (R, S) / S1 (PT) (S, FE) Examination December 2023 (2019 Scheme)

Course Code: EET203

Course Name: MEASUREMENTS AND INSTRUMENTATION

Max. Marks: 100

Duration: 3 Hours

PART A

Answer all questions. Each question carries 3 marks

		Marks
1	Find the multiplying factor of a shunt of 200 ohms resistance used with PMMC of 1000 Ohms resistance	(3)
2	What are the different standards of measurements?	(3)
3	What is a TOD meter?	(3)
4	Write short note on smart metering	(3)
5	Describe the loss of charge method for the measurement of insulation resistance	(3)
6	How earth resistance is measured using earth tester	(3)
7	Explain the construction of flux meter	(3)
8	Write short note on silicon temperature sensors	(3)
9	Briefly explain how time base generator helps in displaying a voltage signal on the screen of CRO.	(3)
10	Explain the flow measurement using ultrasonic transducer?	(3)

PART B

Answer any one full question from each module. Each question carries 14 marks

Module 1

11	With the help of neat diagram describe the construction and working of attraction type and repulsion type moving iron instrument.	(14)
12 a	Discuss different types of damping. What is the necessity of damping and how damping is provided in PMMC instrument?	(8)
12 b	Draw the block diagram of a typical measurement system and indicate the functional elements in detail	(6)

Module 2

- 13 Using equivalent circuit and phasor diagram, derive the expression for transformation ratio and phase angle error of a current transformer (14)
- 14 a Explain the measurement of three phase power using two wattmeter method? (7)
- 14 b W_1 and W_2 reads -1000W and 2000W respectively when connected to 400 V supply. The load is balanced. Find the line current and power factor. State whether the load is inductive or capacitive (7)

Module 3

- 15 a Explain how frequency is measured using Wien's bridge. Also derive the equation for frequency when $R_1=R_2=R$ and $C_1=C_2=C$ (8)
- 15 b With the help of neat diagram explain the calibration of Wattmeter using DC potentiometer (6)
- 16 a With the help of neat diagram explain how high voltage is tested using the method of sphere gap. (10)
- 16 b Write short note on DC hall effect sensors (4)

Module 4

- 17 What is a Lloyd-Fisher square? Explain the measurement of iron losses in a magnetic material employing Lloyd-Fisher square using wattmeter method (14)
- 18 a Explain the working principle of Resistance temperature detector? (7)
- 18 b Describe the method for determination of hysteresis loop of magnetic material Using step-by step method. (7)

Module 5

- 19 a Explain how CRO can be used to measure frequency and phase angle (8)
- 19 b With neat figure explain the working of ramp type digital voltmeter (6)
- 20 a Explain the measurement of any non-electrical quantity employing load cell (7)
- 20 b Explain the constructional details and principle of operation of LVDT with neat figures. (7)
