

0800EET203122003

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Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Third Semester B.Tech Degree Examination December 2020 (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 Explain the significance of measurements. (3)
- 2 How drift affects the input-output relationship? (3)
- 3 The deflection produced by an Electrodynamometer wattmeter is proportional to the power being measured. Justify with necessary equations. (3)
- 4 In single phase induction type Energy meter, why shunt magnet flux should be in exact quadrature with the applied voltage. How this is made possible? (3)
- 5 Explain any one method to measure the leakage resistance of capacitor. (3)
- 6 Construct a bridge circuit to measure the frequency in audio and high frequency oscillators. (3)
- 7 What are the principal requirements in magnetic measurements? (3)
- 8 With neat circuit explain the characteristics of photodiode. (3)
- 9 What is lissajous pattern and how does it vary with phase shift. (3)
- 10 List the merits and demerits of LVDT. (3)

**PART B**

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

**Module 1**

- 11(a) What is controlling force? Explain the various controlling systems used in an indicating instrument? (6)
- 11(b) Explain the various methods for producing damping torque with neat figures. (8)
- 12(a) With neat sketches explain the construction of a PMMC instrument. (8)
- 12(b) "PMMC instruments have uniform linear scale". Justify. (6)

**Module 2**

- 13 Derive the expression for transformation ratio and phase angle error of a potential transformer using its equivalent circuit and phasor diagram. (14)

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- 14(a) Explain the various errors in electro-dynamometer type wattmeter. (8)
- 14(b) With neat circuit show that the deflection produced by a wattmeter is proportional to the power consumed in the circuit. (6)

### Module 3

- 15(a) Explain how low resistance is measured using kelvins Double Bridge method. Derive the balance equation used. (7)
- 15(b) Explain any one method used for the measurement of earth resistance. What are the factors on which the resistance of earthing system depends? (7)
- 16(a) Explain how relative permittivity can be measured using Schering Bridge. (4)
- 16(b) With neat circuit diagram and phasor explain how capacitance is measured using Schering Bridge. What is dissipation factor and derive its equation. (10)

### Module 4

- 17(a) Explain with figure how BH Curve and Hysteresis loop can be determined using step by step method. (8)
- 17(b) List the salient features of thermistors. (6)
- 18(a) What are thermal sensors? Explain any three thermal sensors. With neat circuit show how temperature is measured using thermocouple. List the merits and demerits of using Thermocouple. (9)
- 18(b) What is photovoltaic cell? Explain its construction and characteristics with neat figure. (5)

### Module 5

- 19(a) Briefly explain LVDT with neat figures. What are the merits and demerits of LVDT? Also list down any two applications. (10)
- 19(b) Describe Digital Multimeter. (4)
- 20(a) With neat block diagram explain a general purpose oscilloscope. (10)
- 20(b) How frequency and phase is measured using Lissajous pattern. (4)

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