Code No: R1922021 **R19** SET - 1

II B. Tech II Semester Supplementary Examinations, February - 2022
ELECTRICAL MEASUREMENTS & INSTRUMENTATION
(Electrical and Electronics Engineering)

Time: 3 hours Max. Marks: 75

Answer any **FIVE** Questions each Question from each unit
All Questions carry **Equal** Marks
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1	a)	Explain the following damping systems used in indicating instruments: i) Air friction damping ii) Fluid friction damping iii) Eddy current damping iv) Electromagnetic damping.	[8M]
	b)	A moving coil instrument gives a full-scale deflection of 10 mA when the potential difference across its terminals is 100mV. Calculate i) the shunt resistance for a full-scale deflection corresponding to 100A, ii) the series resistance for full scale reading with 1000V. Calculate the power dissipation in each case.	[7M]

Or

2	a)	Explain the working of Electrostatic instruments and derive the force and torque equations of Electrostatic instruments.	[8M]
	b)	List the disadvantages of Shunts and multipliers and how they can be overcome by Instrument transformers.	[7M]
3	a)	Draw the equivalent circuit of Electrodynamometer Wattmeter and derive the equation for deflection.	[8M]
	b)	In a dynamometer wattmeter the moving coil has 500 turns of mean diameter 30mm. Estimate the torque if the axes of the field and the moving coils are at (i) 60^o (ii) 90^o. When the flues density produced by field coils is $15x10^{-3}$ wb/m^2, the current in moving coil is 0.05A and the power factor is 0.866.	[7M]

Or

4	a)	Explain the features that need to be incorporated in an electrodynamometer wattmeter to make it a low power factor type of Wattmeter.	[8M]
	b)	Describe the constructional details and working of a single phase electrodynamometer type of power factor meter.	[7M]
5	a)	Derive the condition for balance for a Kelvin's double bridge for measurement of low resistance	[8M]
	b)	List the difficulties encountered in measurement of high resistances?	[7M]

Or

6	a)	Explain how an unknown capacitance can be measured by using a Schering bridge.	[8M]
	b)	List and explain the various sources of errors in ac bridges.	[7M]
7	a)	Explain the following: i)Resistive transducer ii) Capacitive transducer.	[8M]
	b)	A barium titanate pickup has the dimensions of 6 mm x 6 mm x 2 mm. The force acting on it is 10 N. The charge sensitivity of barium titanate is 250 pC/N and its permittivity is 12.5 x 10^{-9} F/m. If the modulus of elasticity of barium titanate is 12 x 10^6 N/m^2, calculate the strain. Also calculate the charge and the capacitance.	[7M]

Or

8	a)	List the major types of Strain gauges and explain each one in brief.	[8M]
	b)	Explain the working of piezo electric transducer and writes its advantages.	[7M]

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9 a) Explain the working of Ramp type digital Voltmeter with a neat block diagram and necessary timing diagram of Voltage to time conversion. [8M]

b) What is a power analyzer? List the advantages of power Analyzer. [7M]

Or

10 a) With a neat schematic block diagram explain the working of Digital Frequency Meter. [8M]

b) Discuss the working of digital frequencies meter. [7M]