

R16

Code No: 135AN

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, January/February - 2023

ELECTRICAL MEASUREMENTS AND INSTRUMENTATION

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 75

Note: i) Question paper consists of Part A, Part B.

ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.

iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART - A

(25 Marks)

- 1.a) What are the advantages of M. I instrument? [2]
- b) State the various methods of providing damping torque in indicating instruments. [3]
- c) What is the purpose of transfer instrument in potentiometers? [2]
- d) State the differences between C. T and P. T. [3]
- e) Two wattmeter method used to measure power in 3-phase balanced system, the readings of two wattmeter's given same, what is the power factor of the load? [2]
- f) State various errors present in 3-phase energy meter. [3]
- g) Draw the circuit for Anderson's bridge. [2]
- h) What are the applications of Schering Bridge? [3]
- i) Define Gauge factor. [2]
- j) State the principle of operation of thermistors. [3]

PART - B

(50 Marks)

- 2.a) The pointer of a moving coil instrument gives full scale deflection of 20mA. The potential difference across the meter when carrying 20mA is 400mV. Determine i) the shunt resistance required to design 0- 200A range ammeter.
ii) the series resistance required to design 0- 1000V range voltmeter.
- b) Explain the principle of working of attracted disc type Electrostatic voltmeter and mention its applications. [4+6]

OR

3. Explain the working of PMMC instrument. State the errors present in them. [10]
4. Explain the Principle and working of Polar type AC potentiometer with a neat sketch. [10]

OR

5. Why Potential transformer is needed? And list different errors occurred in PTs. How to minimize them? [10]

QA QA QA QA QA QA QA G

6.a) How could you extend the range of wattmeter using instrument transformers? Elaborate.

b) Explain the construction and operation of Merz price maximum demand meters. [5+5]

QA QA QA QA **OR** QA QA G

7.a) How can you test energy meter by phantom loading? Explain.

b) Explain the construction and working of three element dynamometer wattmeter. [5+5]

8.a) How could you measure medium resistance using Wheatstone bridge? Elaborate.

b) Construct the circuit for Maxwell's bridge and develop relation for unknown Inductance. [5+5]

QA QA QA QA **OR** QA QA QA QA G

9.a) How could you measure Low resistance using kelvins double bridge? Discuss with the help of diagram.

b) Construct the circuit of Desauty's Bridge and develop relation for unknown capacitance. [5+5]

10.a) Explain the principle of piezo electric transducer? And mention its advantages and Applications.

b) How could you measure Acceleration? Explain any one of such method. [5+5]

QA QA QA QA **OR** QA QA QA QA G

11.a) Explain the principle of operation of Thermocouple and mention its advantages.

b) Discuss principle of operation of Capacitance transducers and list their applications. [5+5]

QA QA QA ~~---ooOoo---~~ QA QA QA G

QA QA QA QA QA QA QA G

QA QA QA QA QA QA QA G

QA QA QA QA QA QA QA G