Enrolment No./Seat No_____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE - SEMESTER–VI (NEW) EXAMINATION – SUMMER 2024**

**Subject Code:3160915 Date:17-05-2024**

**Subject Name:Electrical Measurement and Measuring Instruments**

**Time:10:30 AM TO 01:00 PM Total Marks:70**

**Instructions:**

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

| | | | MARKS |
|---|---|---|---|
| **Q.1** | **(a)** | Define 1) Sensitivity 2) Drift 3) Precision. | **03** |
| | **(b)** | Explain advantages of electrical transducer. | **04** |
| | **(c)** | Draw a functional block diagram of the measurement system. Also explain the function of each block in brief. | **07** |
| **Q.2** | **(a)** | Enlist pressure sensitive primary devices. Explain any one in brief. | **03** |
| | **(b)** | Explain working principle of strain gauge. | **04** |
| | **(c)** | Describe the working principle, construction and operation of R.T.D. Draw it's characteristics. | **07** |
| | | **OR** | |
| | **(c)** | Define transducer & give classification of transducers on different basis. | **07** |
| **Q.3** | **(a)** | List out drawback of Shunt and Multiplier. | **03** |
| | **(b)** | Describe the constructional detail of a PMMC instrument with the help of diagram. | **04** |
| | **(c)** | State and explain the methods of extension of range of Voltmeter. | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | Explain construction and working of Instrument transformers. | **03** |
| | **(b)** | Describe the constructional detail of a moving iron instrument with the help of diagram. | **04** |
| | **(c)** | Explain construction and working of Induction type single phase energy meter. Derive it's torque equation. . | **07** |
| **Q.4** | **(a)** | Enlist different methods of measurement for low, medium and high resistances. | **03** |
| | **(b)** | Explain the loss of charge method for measurements of insulation resistance. | **04** |
| | **(c)** | How the effect of contact resistance and resistance of the connecting leads are eliminated using kelvin's double bridge? Explain with neat diagram. | **07** |
| | | **OR** | |

| | | | |
|---|---|---|---|
| **Q.4** | **(a)** | Enlist different bridges used for the measurement of inductance. | **03** |
| | **(b)** | Draw neat diagram of Schering Bridge, derive the equations of balance. | **04** |
| | **(c)** | Explain Maxwell's inductance-capacitance bridge for measurement of inductance. Derive bridge balance equation. Also draw phasor diagram. | **07** |
| **Q.5** | **(a)** | What is clamp on meter? Write its applications. | **03** |
| | **(b)** | Explain measurement of capacitance with the help of De Sauty's Bridge. | **04** |
| | **(c)** | Explain block diagram of Digital Storage Oscilloscope .Enlist its applications. | **07** |

**OR**

| | | | |
|---|---|---|---|
| **Q.5** | **(a)** | Give comparison of Analog and Digital multimeter. | **03** |
| | **(b)** | Explain measurement of resistance with the help of Wheatstone Bridge. | **04** |
| | **(c)** | Describe the construction, working and application of megger with suitable diagram. | **07** |

**********