

### **Inauguration of Certificate Course on Basic Electronic** Instrumentation







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### **Course Contents**

### **UNIT-I Philosophy of Measurements**

- Methods of measurement
- Measurement system
- 1. Essential Requirement of Indicating Instruments
  - 1. Deflecting torque
    - 2. Controlling torque
    - 3. Damping torque or restoring torque
    - i. Air friction damping
    - ii. Eddy current damping
  - Classification of instrument systems
  - \* Characteristics of instruments & measurement Systems
  - \* Errors in measurement & its analysis.
- 2. Analog Measurement of Electrical Quantities-
  - Electrodynamic, Thermocouple,
    - Electrostatic & Rectifier type ammeters & voltmeters,
    - \* Electrodynamic wattmeter,
    - Three Phase wattmeter
    - \* Power in three phase systems
    - \* Errors & remedies in wattmeter
    - \* Energy meter.

#### **UNIT-II: Instrument Transformers**

- CT and PT their errors
- \* Applications of CT and PT in the extension of instrument range
- Introduction to measurement of speed frequency
- Introduction to measurement of power factor

#### **UNIT-III: Measurement of Parameters**

- Different methods of measuring low
- medium and high resistances
- measurement of inductance & capacitance with the help of AC Bridges
- ✤ Q meter.

### **UNIT-IV: AC Potentiometers and**

#### **UNIT-V: Digital Instruments for Measurements**

 Digital Measurement of Electrical Quantities-Concept of digital measurement, Block diagram

- Study of digital voltmeter,
- Frequency meter,
- Spectrum analyser,
- \* Electronic multimeter.
- Cathode Ray Oscilloscope-
- Basic CRO circuit (block diagram), Cathode Ray Tube (CRT) & its components, Applications of CRO in measurement,
- Lissajous Pattern, Dual trace & dual beam oscilloscopes.

### Certificate Course: Basic Elemenic

# Attendance Register of

Year, Class Instrumentation

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# Basic Electronic Instrumentation

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### Government Degree College , Mahabubabad

### **Certificate Course on: Basic Electronic Instrumentation**

### **QUESTION PAPER : ELECTRONIC INSTRUMENTATION**

### Max Marks:100

#### Note:

- Question number 1-5 carries 2 Marks
- Question number 6-15 carries 3 Marks
- Question number 16-20 carries 12 Marks

Q.1. Which of the following instruments indicate the instantaneous value of the electrical quantity being measured at the time at which it is being measured ?

- (a) Absolute instruments
- (b) Indicating instruments
- (c) Recording instruments
- (d) Integrating instruments

<ul> <li>Q.2.Which of the following are integrating instruments ?</li> <li>(a) Ammeters</li> <li>(b) Voltmeters</li> <li>(c) Wattmeters</li> <li>(d) Ampere-hour and watt-hour meters</li> </ul>	(	)
<ul> <li>Q.3. Most common form of A.C. meters met with in every day domestic and industrial installations are <ul> <li>(a) mercury motor meters</li> <li>(b) commutator motor meters</li> <li>(c) induction type single phase energy meters</li> <li>(d) all of the above</li> </ul> </li> </ul>	(	)
<ul> <li>Q.4. The disc of an instrument using eddy current damping should be of <ul> <li>(a) conducting and magnetic material</li> <li>(b) non-conducting and magnetic material</li> <li>(c) conducting and non-magnetic material</li> <li>(d) none of the above</li> </ul> </li> </ul>	(	)
<ul> <li>Q.5. The resistance in the circuit of the moving coil of a dynamometer wattmeter should be</li> <li>(a) almost zero</li> <li>(b) low</li> <li>(c) high</li> <li>(d) none of the above</li> </ul>	(	)

### Q.6. In a low power factor wattmeter, the pressure coil is connected ( )

- (a) to the supply side of the current coil
- (b) to the load side of the current coil

(c) in any of the two meters at connection

(d) none of the above

Q.7. A 0-300V voltmeter has the error of + 2% of FSD. What would be the range of reading if true voltage is 30 ( )

- (a) 24-30V (b) 29.4-30.6V (c) 20-30V (d) none of the above
- Q.8. A arsenal movement is rated at 50 micro A. Its sensitivity is : (

)

(

)

(a) 20000 ohm/V (b) 200000hm/V (c) 200 ohm/V (d)None of the above

Q.9. In a 3-phase power measurement by two wattmeter method, both the watt meters had		
identical readings. The power factor of the load was	(	)
(a) unity		

- (6) 0.8 lagging
- (c) 0.8 leading
- (d) zero

Q.10. The adjustment of position of shading bands, in an energy meter is done to provide ) (

- (a) friction compensation
- (b) creep compensation
- (c) braking torque
- (d) none of the above
- Q.11. The electrical power to a meggar is provided by
  - (a) battery
  - (b) permanent magnet D.C. generator
  - (c) AC. generator
  - (d) any of the above
- Q.12. It is required to measure the true open circuit e.m.f. of a battery. The best device is ) ( (a) D.C. voltmeter
  - (b) Ammeter and a known resistance
  - (c) D.C. potentiometer
  - (d) None of the above

#### Q.13. To measure a resistance with the help of a potentiometer it is ( )

- (a) necessary to standardize the potentiometer
- (b) not necessary to standardize the potentiometer
- (c) necessary to use a volt ratio box in conjunction with the potentiometer
- (d) none of the above

Q.14. To achieve high accuracy, the slide wire of a potentiometer should be ) ( (a) as long as possible

- (b) as short as possible

(c) neither too small not too large(d) very thick

Q.15. In an AC. co-ordinate potentiometer, the currents in the phase and quadrature potentiometer are adjusted to be

( )

- (a) out of phase by  $90^{\circ}$
- (6) out of phase by  $60^{\circ}$
- (c) out of phase by  $30^{\circ}$
- (d) out of phase by  $0^{\circ}$
- (e) out of phase by 180°

Q.16 (A).Explain any two methods for measurement of medium measurement.

Q.16 (B). In a potentiometer system with a standard cell of emf of 1.08 V, the galvanometer shows zero deflection for a balanced point of 100 cm. What is the emf of a cell which balances at 150 cm?

Q.17. A Crompton potentiometer consist of resistance dial having 15 steps of 10  $\Omega$  each and a series connected slide wire of 10  $\Omega$  is divided in 100divisions. If the working current of potentiometer is 10mA and each division of slide wire can be rea accurately up to 1/5 of its span, calculate the resolution of potentiometer.

Q.18(A).Explain de sauty's bridge with help of balance equation?

Q.18 (B).Explain how the range of ammeter can be increased?

Q.19(A). Explain the electro dynamo meter type instrument with derivation.

Q.19(B).Explain the operation of ac voltmeter using half wave rectifier and full wave rectifier.

Q.20(A). Discuss different type of Standards of measurement. Classify and explain the different type of Standards of measurement.

Q.20(B). Explain with block diagram, the operation of ramp type DVM.



**GOVERNMENT DEGREE COLLEGE** 

MAHABUBABAD - MAHABUBABAD(Dist.), Telangana-506101.

Accredited by NAAC with "B" Grade (CGPA 2.44/4.00)



# DEPARTMENT OF PHYSICS

# Certificate

-----of Participation and Completion------

This is to certify that Sk. Ajith, III B. Sc MPCs (EM), GOVERNMENT DEGREE COLLEGE, MAHABUBABAD has participated and successfully completed the certificate course on "Basic Electronic Instrumentation" organised by Department of Physics, Government Degree College, Mahabubabad, Mahabubabad (Dist.), Telangana, INDIA commenced from 05-08-2019 to 26-09-2019.

Certificate generated on November, 06 of 2019.

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Sri.R. Venugopal Convenor & Asst.Professor of Physics Government Degree College, Mahabubabad

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