

**'T' Scheme**

**Sample Question Paper**

**Program Name** : Electrical Engineering Program Group  
**Program Code** : EE/EP/EU  
**Semester** : Third  
**Course Title** : Electrical and Electronic Measurements  
**Max. Marks** : 70

**22325**

**Time: 3 Hrs.**

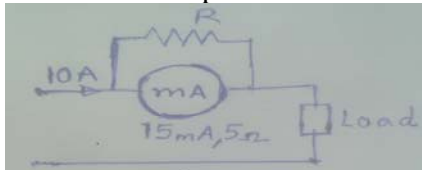
**Instructions:**

- (1) All questions are compulsory.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data if necessary.
- (5) Preferably, write the answers in sequential order.

**Q.1 Attempt any FIVE of the following.**

**10 Marks**

- a. Define the following terms with respect to measuring instrument :  
i) Accuracy ii) Sensitivity
- b. State the meaning of i) Deflecting Torque ii) Damping Torque.
- c. State the working principle of dynamometer type wattmeter.
- d. State any two benefits of Electronic Energy meter.
- e. Electronic Energy meter is also called as static energy meter, justify your answer.
- f. In the given diagram the range of meter having internal resistance of 5 ohm, has to be extended to read from 15mA to 10Amp. calculate the value of R



- g. In a circuit, power is to be measured with a wattmeter having specification of 15A / 400V, 1500 watts full scale deflection. The reading of wattmeter was 750 watts. State the value of actual power consumed by the load.

**Q.2 Attempt any Three of the following.**

**12 Marks**

- a. Describe with relevant sketch Instrumental errors and observational errors in measuring instruments.
- b. Compare the analog ammeter and voltmeter on the basis of following points:  
i) Connection in the circuit                      ii) resistance  
iii) Circuit symbol                                      iv) Extension of range
- c. Describe the process of calibration of D.C. voltmeter using D.C. potentiometer.
- d. A moving coil instrument gives full scale deflection of 24 mA. When P.D. across it is 72 mV. Determine the value of:  
i) Series resistance for full scale deflection of 600 V  
ii) Find the power consumption in meter.

**Q.3) Attempt any Three of the following.**

**12 Marks**

- a. CT is used to extend the range of ammeter in an electrical circuit. Explain the effect of open circuited secondary on the function of CT.
- b. One wattmeter of range 20A/300V is to be used to measure the power in variable load single phase circuit. Suggest the connection of wattmeter with sketch for measurement of power in case of i) lower and ii) higher value of load.
- c. A wattmeter with its current coil in line R and pressure coil across Y and B reads 3.2kW for a balanced load of 0.6 lagging p.f. The supply voltage is 400 V. Determine the following :
  - i) current
  - ii) power
  - and iii) reactive volt ampere of the load.
- d. Explain the working of single phase electronic energy meter with relevant sketch.

**Q.4) Attempt any Three of the following.**

**12 Marks**

- a. Draw a neat labeled block diagram of 3-phase electronic energy meter.
- b. Draw the neat labeled diagram showing the controls available on front panel of general purpose CRO.
- c. Explain the working principle of phase sequence indicator with relevant constructional diagram.
- d. Describe the construction of Weston type frequency meter with labeled diagram
- e. Describe the functions of following components of CRT :
  - i) Electron gun
  - ii) vertical amplifier
  - iii) horizontal amplifier
  - iv) time base generator

**Q.5) Attempt any Two of the following.**

**12 Marks**

- a. Explain the working of PMMC instrument with a labeled sketch.
- b. Explain the working of maximum demand indicator with a neat sketch.
- c.
  - i) Draw a neat diagram of kelvin double bridge
  - ii) A four terminal resistor of approximately 50 micro ohm resistance was measured by means of Kelvin double bridge having the following component resistance  
Standard resistor = 100.03 micro ohm Inner ratio arm = 100.31ohm and 200 ohm  
Outer ratio arm = 100.24 ohm and 200 ohm Resistance of link connecting the standard and the unknown resistance = 700 micro ohm.  
Calculate the unknown resistance to the nearest 0.01 micro ohm.

**Q.6) Attempt any Two of the following.**

**12 Marks**

- a. Describe with sketch the process of calibration of single phase electronic energy meter using direct loading.
  - b. Explain with labeled sketches the working of function generator with the help of labeled block diagram.
  - c. Explain with labeled sketches the construction and working of synchroscope .
-

**'I' Scheme**

**Sample Question Paper**

(40% of 5-Unit curriculum and 50% of 6-Unit curriculum)

**Program Name** : **Electrical Engineering Program Group**  
**Program Code** : **EE/EP/EU**  
**Semester** : **Third**  
**Course Title** : **Electrical and Electronic Measurements**  
**Max. Marks** : **20**

22325

**Time: 1 Hour**

**Instructions:**

- (1) All questions are compulsory.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data if necessary.
- (5) Preferably, write the answers in sequential order.

**Q.1 Attempt any FOUR.**

**08 Marks**

- a. State the essential requirements of indicating instruments
- b. Differentiate between null and deflection type instruments
- c. State the advantages of PMMC instrument.
- d. Design multirange dc voltmeter of range 0-100 V. Assume full scale deflection current is 5mA and internal resistance of meter is 500 ohm
- e. Draw the neat labeled circuit diagram for measurement of power in 3-phase circuit using two wattmeter method
- f. In a circuit, power is to be measured with a wattmeter having specification of 15A / 400V, 1500 watts full scale deflection. The reading of wattmeter was 750 watts. State the value of actual power consumed by the load.

**Q.2 Attempt any THREE.**

**12 Marks**

- a. List any eight static characteristics of measuring instrument.
- b. Describe gross error and instrumental error in measuring instruments.
- c. Explain the working of PMMI meter with neat sketch.
- d. CT is used to extend the range of ammeter in an electrical circuit. Explain the effect of open circuited secondary on the function of CT
- e. A wattmeter with its current coil in line R and pressure coil across Y and B reads 3.2kW for a balanced load of 0.6 lagging p.f. The supply voltage is 400 V. Determine the following :
  - i) current
  - ii) power
  - and
  - iii) reactive volt ampere of the load
- f. Describe the construction of dynamometer type single phase wattmeter

**'I' Scheme**

**Sample Test Paper - II**

(60% of 5-Unit curriculum and 50% of 6-Unit curriculum)

**Program Name** : **Electrical Engineering Program Group**  
**Program Code** : **EE/EP/EU**  
**Semester** : **Third**  
**Course Title** : **Electrical and Electronic Measurements**  
**Max. Marks** : **20**

22325

**Time: 1 Hour**

**Instructions:**

- (1) All questions are compulsory.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data if necessary.
- (5) Preferably, write the answers in sequential order.

**Q.1 Attempt any FOUR.**

**08 Marks**

- a) State the working principle of single phase electronic energy meter.
- b) List any four errors occurring in single phase electronic energy meter.
- c) Give the classification of resistances stating their values.
- d) State the working principle of phase sequence indicator.
- e) Draw a neat block diagram of single beam CRO.
- f) State the significance of function generator.

**Q.2 Attempt any THREE.**

**12 Marks**

- a) Explain with a neat diagram the calibration of single phase electronic energy meter using direct loading.
- b) Draw a neat labeled block diagram of 3-phase electronic energy meter.
- c) Describe with a neat sketch the construction of ferromagnetic type frequency meter.
- d) Explain the working of Synchroscope with neat sketch.
- e) Explain the working of signal generator with basic block diagram.
- f) State the applications and advantages of tri vector meter.