



\* R N - 8 0 8 9 / 3 0 0 \*

**RN-8089**

**B. E. - II (Sem. III) (Electrical) Examination**  
**May / June - 2010**

**Electrical & Electronic Measuring Instruments**  
*(As per GTU Syllabus)*

Time : 3 Hours]

[Total Marks : 100

**Instructions :**

(1)

नीचे दशविक निशानीवाणी विगतो उत्तरवडी पर अवश्य लपवी. Fillup strictly the details of signs on your answer book.	Seat No. :
Name of the Examination :	<input type="text"/>
<b>B. E. - 2 (Sem. 3) (Electrical)</b>	<input type="text"/>
Name of the Subject :	<input type="text"/>
<b>Electrical &amp; Electronic Measuring Instruments</b>	<input type="text"/>
Subject Code No. : <input type="text"/> 8 <input type="text"/> 0 <input type="text"/> 8 <input type="text"/> 9	<input type="text"/>
Section No. (1, 2,.....): <input type="text"/> 1&2	<input type="text"/>
	Student's Signature

(2) Attempt **all** the questions.

(3) Figures to the right indicate full marks.

### SECTION - I

- 1 (a) State 'true' or 'false' for the following statements : **5**
- (i) Instrument with 1% accuracy is more accurate than the one with 10% accuracy.
  - (ii) PMMC instruments can be used for measurement of AC power.
  - (iii) 'Shunts' are very high value resistances.
  - (iv) Controlling torque is must to get steady reading in analog instruments.
  - (v) Moving iron type instruments can be used for measurement of d.c. voltage and currents only.
- (b) Answer the following :
- (i) Define : True value, resolution. **2**
  - (ii) Define : 'Shunts'. **1**
  - (iii) What is 'underdamped system' in case of d'Arsonval galvanometer? **2**

- (c) Derive torque equation of a PMMC instrument and list advantages of such instruments. 10
- 2 (a) State advantages and disadvantages of moving iron type instruments. 7
- (b) Discuss dynamic behaviour of d'Arsonval galvanometer. 8

**OR**

- 2 (a) Explain "PMMC" instrument as voltmeter". 5
- (b) Explain various effects which can be used for operation of analog instruments. 10
- 3 Attempt any **three** : 15
- (i) Explain construction of D'Arsonval galvanometer.
- (ii) Discuss various damping systems used in analog instruments.
- (iii) Write a short note on "Hot wire instruments".
- (iv) Discuss errors in moving iron type instruments.
- (v) A 2 mA meter d'Arsonval movement with an internal resistance of  $120\ \Omega$  is to be converted into 0-50 mA ammeter. Calculate the shunt resistance required.

## SECTION - II

- 4 (a) State 'true' or 'false' for the following statements : 5
- (i) D.C. potentiometer can be used to measure resistance.
- (ii) Energymeters are deflection type instruments.
- (iii) Electronic voltmeters are better than analog deflection type voltmeters.
- (iv) Induction type instruments are generally used as energymeters.
- (v) Voltage of standard cell is 1.5 V.

- (b) Answer the following :
- (i) Define 'standardization' in case of potentiometers. 2
  - (ii) Explain 'creeping' in case of induction type energy meters. What compensation is used for it? 2
  - (iii) What do you mean by 'unit' in case of energy measurement ? 1
- (c) Answer the following :
- (i) Explain 'voltage ratio box' in case of potentiometer. 5
  - (ii) Draw practical wattmeter connections for measurement of single phase power. What error can be introduced because of connections? 5
- 5 (a) Explain in detail construction of single phase induction type energy meter. 10
- (b) List errors in electro-dynamometer type instruments. 5
- OR**
- 5 (a) Explain principle of d.c. potentiometer. 6
- (b) Power measurement by two wattmeter method for a certain three phase load gave following results : 6
- $W_1 = 5000 \text{ W}, W_2 = 3000 \text{ W}$
- Find total active power, reactive power and power factor of the load.
- (c) How can we measure d.c. power? - Explain. 3
- 6 Attempt any **three** : 15
- (i) Write a short note on "compensation used in induction type energy meters".
  - (ii) Discuss 'Basic Electronic Voltmeter'.
  - (iii) Write a short note on "Power Factor meter".
  - (iv) Discuss two wattmeter method for measurement of three phase power.
  - (v) Write a short note on "synchroscope".