

KADI SARVA VISHWAVIDHYALAYA

B.E. Semester III Examination (Dec-2016)

Subject Code: - EE-303 Subject Name: - Electrical Measurement & Measuring Instruments

Date:- 24/12/2016

Time:- 10:30am to 1:30pm

Total Marks:- 70

Instructions:

1. Answer each section in separate Answer Sheet.
 2. Use of scientific calculator is permitted.
 3. All questions are **Compulsory**.
 4. Indicate **clearly**, the options you attempt along with it's with respective question number.
 5. Use the last page of main supplementary of **rough work**.

Section – I

- | | | |
|------------|---|---|
| Q.1 | (A) Derive the General Equation for Bridge Balance. | 5 |
| | (B) Derive the Torque and Force Equation of Electrostatic Type Instruments. | 5 |
| | (C) Which difficulties occurs during high resistance measurement and what is use of guard circuit. | 5 |
| OR | | |
| | (C) Explain constructional details & working of an Electrodynamometer type 3-phase power factor meter. | 5 |
| Q.2 | (A) Explain loss of charge method for high resistance measurement. | 5 |
| | (B) Define (i) Accuracy (ii) Precession (iii) True Value (iv) Resolution (v) Error | 5 |
| OR | | |
| Q.2 | (A) Describe construction and working of PMMC instrument | 5 |
| | (B) A 3-ph 850V motor load has a p.f of 0.85. Two wattmeter's connected to measure the input. The input to be 80kW. Find the reading of each wattmeter. | 5 |
| Q.3 | (A) What is a standard of measurement? Describe the method of measurements. | 5 |
| | (B) What is energy? Discuss construction of induction type single phase energy meter. | 5 |
| OR | | |
| Q.3 | (A) Show that in two wattmeter method of power measurement for 3-Ø balanced load system, the total power consumed is the sum of reading of two wattmeter. | 5 |
| | (B) What is an 'ammeter shunt'? Explain how it is used in case of ammeters. | 5 |

Section - II

- Q.4** (A) Derive equation for De Sauty's bridge for capacitance measurement with diagram. 5
(B) What methods are used for frequency measurement? Explain any one method in detail. 5
(C) Explain the working principle of A.C. potentiometer. 5
OR
(C) What is Potentiometer? Explain the Basic Circuit of Potentiometer. 5
- Q.5** (A) Explain Inductance – Capacitance Bridge and Give the Advantage and Disadvantage of Inductance – Capacitance Bridge. 5
(B) Explain the limitations of the bridge measurement and their minimization. 5
OR
Q.5 (A) Which methods use for Measurement of Low Resistance, Explain any one method. 5
(B) Explain Application of A.C. Potentiometers. 5
- Q.6** (A) What is Ground Fault? Explain Murray loop test. 5
(B) Explain construction and working of Moving Iron instruments. 5
OR
Q.6 (A) What is Short Circuit Fault? Discuss the Varley loop test. 5
(B) Describe working of low voltage Schering Bridge. Derive the equation of capacitance and dissipation factor. 5

KADI SARVA VISHWAVIDHYALAYA

B.E. Semester III (EE) Examination (Dec/2015)

Subject Code: - EE-303 Subject Name: - Electrical Measurement & Measuring Instruments

Date:- 03/12/2015

Time:- 10:30am to 1:30pm

Total Marks:- 70

Instructions:

1. Answer each section in separate Answer Sheet.
2. Use of scientific calculator is permitted.
3. All questions are **Compulsory**.
4. Indicate **clearly**, the options you attempt along with it's with respective question number.
5. Use the last page of main supplementary of **rough work**.

Section – I

Q.1 (A) Derive the Torque and Force Equation of Electrostatic Type Instruments. 5
(B) Write a types of Maximum demand indicator and explain average demand indicators. 5

(C) Describe the constructional detail of an attraction type moving iron instrument with help of Diagram. 5

OR

(C) What is energy? Discuss construction of induction type single phase energy meter. 5

Q.2 (A) Which difficulties occurs during high resistance measurement and what is use of guard circuit. 5

(B) Define (i) Creeping (ii) Precession (iii) True Value (iv) Resolution (v) Accuracy 5

OR

(A) Describe construction and working of PMMC instrument. 5

(B) What is an 'ammeter shunt'? Explain how it is used in case of ammeters. 5

Q.3 (A) Explain constructional details & working of an Electrodynamometer type 3-phase power factor meter. 5

(B) A 3-ph 700V motor load has a p.f of 0.8. Two wattmeter's connected to measure the input. The input to be 60kW. Find the reading of each wattmeter. 5

OR

(A) Show that in two wattmeter method of power measurement for 3-Ø balanced load system, the total power consumed is the sum of reading of two wattmeter. 5

(B) What is a standard of measurement? Describe the method of measurements. 5

Section – II

Q.4 (A) Give classification of Measurement of Inductance, Explain any one. 5

(B) What is short circuit fault in cable? Explain Varley loop test. 5

(C) Explain the working principle of A.C. potentiometer. 5

OR

(C) Give classification of Resistance and Explain Substitution method for medium Resistance. 5

Q.5 (A) What is Ground Fault? Explain Murray loop test. 5

(B) Explain Application of A.C. Potentiometers. 5

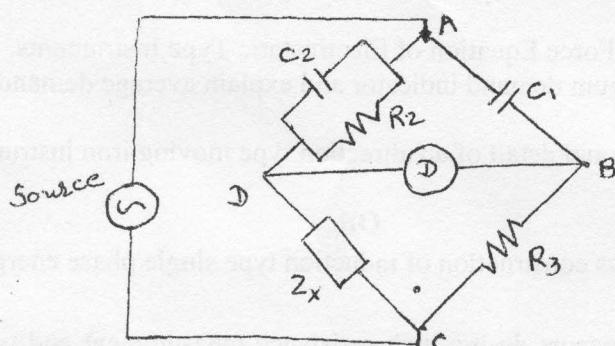
OR

(A) An a.c. bridge circuit working at 1khz have its arms as follows. 5

Arm AB: $C_1=0.2\mu F$ capacitance , arm BC: $R_3=500\Omega$ resistance

Arm CD: unknown impedance, arm DA: $R_2=300\Omega$ resistance in parallel with $0.1\mu F$ capacitor.

Find R and L or C constants of the arm CD considering it as a series circuit.



(B) Explain Inductance – Capacitance Bridge and Give the Advantage and Disadvantage of Inductance – Capacitance Bridge. 5

Q.6 (A) What is Potentiometer? Explain the Basic Circuit of Potentiometer. 5

(B) Derive the General Equation for Bridge Balance. 5

OR

(A) Explain the loss of charge method for measurements of insulation resistance of cables. 5

(B) Explain Maxwell's Bridge for measurement of self-inductance with vector diagram and also Derive balance equation. 5

KADI SARVA VISHWAVIDHYALAYA

B.E. Semester III

Subject Code: - EE-303 Subject Name: - Electrical Measurement & Measuring Instruments

Date:- 26/11/2013

Time:- 10:00 am to 1:00 pm

Total Marks:- 70

Instructions:

1. Answer each section in separate Answer Sheet.
2. Use of scientific calculator is permitted.
3. All questions are **Compulsory**.
4. Indicate **clearly**, the options you attempt along with it's with respective question number.
5. Use the last page of main supplementary of **rough work**.

Section – I

- Q.1** (A) What is measurement? Describe the Characteristics of measurements. 5
(B) Explain the Types of Errors. 5
(C) Give the comparison of Deflection and Null Type Instruments. 5

OR

- (C) What is a 'Voltage Multipliers'? Explain how it is used in case of Voltmeter. 5

- Q.2** (A) Describe the constructional detail of an Repulsion type moving iron instrument with help of Diagram. 5
(B) Describe the Construction of Electrodynamometer Type Instruments. 5

OR

- (A) Describe construction and working of PMMC instrument 5
(B) Discuss construction of induction type single phase energy meter. 5

- Q.3** (A) Describe the constructional detail of an Electrodynamometer Wattmeter with help of Diagram. 5
(B) Explain constructional details & working of a Moving Iron power factor meter. 5

OR

- (A) Show that in two wattmeter method of power measurement for $3-\varnothing$ balanced load system, the total power consumed is the sum of reading of two wattmeter. 5
(B) Explain constructional details & working of an Electrodynamometer type 3-phase power factor meter. 5

Section – II

- Q.4** (A) Derive the General Equation for Bridge Balance. 5
(B) Explain Maxwell's Induction Bridge with vector diagram and also Derive balance equation. 5
(C) Explain the working principle and Types of A.C. potentiometer. 5
OR
(C) Explain Maxwell's Inductance – Capacitance Bridge and Give the Advantage and Disadvantage of Inductance – Capacitance Bridge. 5
- Q.5** (A) What is Potentiometer? Explain the Basic Circuit of Potentiometer. 5
(B) Give classification of Resistance and Explain Ammeter-Voltmeter for medium Resistance. 5
OR
(A) Explain Kelvin Double Bridge Method of Measurement of Low Resistance. 5
(B) Explain the Application of D.C. potentiometer. 5
- Q.6** (A) Explain Murray loop test. 5
(B) Explain De Sauty's Bridge with vector diagram and also Derive balance equation. 5
OR
(A) What is Short Circuit Fault? Discuss the Varley loop test. 5
(B) Explain Electro-dynamometer type Synchronoscope. 5

KADI SARVA VISHWAVIDHYALAYA

B.E. Semester III

Subject Code: - EE-303 Subject Name: - Electrical Measurement & Measuring Instruments

Date:- 25/04/2014

Time:- 10:30 to 1:30

Total Marks:- 70

Instructions:

1. Answer each section in separate Answer Sheet.
 2. Use of scientific calculator is permitted.
 3. All questions are **Compulsory**.
 4. Indicate **clearly**, the options you attempt along with it's with respective question number.
 5. Use the last page of main supplementary of **rough work**.

Section – I

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|-----|--|-------------|
| Q.1 | <p>(A) Define (i) Accuracy (ii) Precession (iii) True Value (iv) Resolution (v) Error
 (B) Classify various measuring instruments and discuss Null type and deflection type instruments.
 (C) What is a standard of measurement? Describe various standards of measurements.</p> | 5
5
5 |
| | OR | |
| | <p>(C) What are the shunts and multipliers? Mention their application.</p> | 5 |
| Q.2 | <p>(A) Describe construction and working of PMMC instrument.
 (B) Explain how two wattmeters are used to measured power of a 3-phase balance load.</p> | 5
5 |
| | OR | |
| | <p>(A) Derive the torque equation for induction type single phase energy meter.
 (B) Write short notes on Maximum Demand Indicator.</p> | 5
5 |
| Q.3 | <p>(A) Explain the working principle of A.C. potentiometer. State the application of AC potentiometer.
 (B) Explain constructional details & working of an Electrodynamometer type 3-phase power factor meter.</p> | 5
5 |
| | OR | |
| | <p>(A) Give classification of errors in detail and explain their remedies in brief.
 (B) Describe the construction and working of Weston type frequency meter.</p> | 5
5 |

Section – II

- Q.4** (A) Explain Anderson bridge with vector diagram and also derive balance equation. 5
(B) A 3-ph 500V motor load has a p.f of 0.4. Two wattmeter's connected to measure the input. 5
The input to be 30kW. Find the reading of each wattmeter.
(C) Explain construction and working of Moving Iron instruments. 5
- OR**
- (C) Explain Owen bridge with vector diagram. 5
- Q.5** (A) Limitation for the bridge measurement and their minimization. 5
(B) Give classification of Resistance and Explain Substitution method for medium Resistance. 5
- OR**
- (A) Which methods use for Measurement of Low Resistance, Explain any one method. 5
(B) Explain Maxwell's bridge for measurement of self inductance. 5
- Q.6** (A) Explain Murray loop test for location cable fault. 5
(B) Explain Schering Bridge with diagram. 5
- OR**
- (A) Discuss the Varley loop test method for detection of cable fault. 5
(B) Write short notes on Electro-dynamometer type Synchronoscope? 5

KADI SARVA VISHWAVIDHYALAYA

B.E. Semester III

Subject Code: - EE-303

Subject Name: - Electrical Measurement & Measuring Instruments

Date:- 15/11/2014

Time:- 10:30 to 1:30

Total Marks:- 70

Instructions:

1. Answer each section in separate Answer Sheet.
2. Use of scientific calculator is permitted.
3. All questions are **Compulsory**.
4. Indicate **clearly**, the options you attempt along with it's with respective question number.
5. Use the last page of main supplementary of **rough work**.

Section – I

Q.1 (A) What is a standard of measurement? Describe the method of measurements. 5

(B) Define (i) Accuracy (ii) Precession (iii) True Value (iv) Resolution (v) Error 5

(C) Explain the working principle of A.C. potentiometer. State the applications of AC potentiometer. 5

OR

(C) Explain the operating principle of Electrodynamometer type Instrument. 5

Q.2 (A) Describe the constructional detail of an attraction type moving iron instrument with help of Diagram. 5

(B) Derive the Torque and Force Equation of Electrostatic Type Instruments. 5

OR

(A) Describe construction and working of PMMC instrument 5

(B) State the advantages and disadvantages of Electrostatic Instruments. 5

Q.3 (A) Explain construction and working of Moving Iron instruments. 5

(B) A 3-ph 500V motor load has a p.f of 0.4. Two wattmeter's connected to measure the input. The input to be 30kW. Find the reading of each wattmeter. 5

OR

(A) Show that in two wattmeter method of power measurement for 3-Ø balanced load system, the total power consumed is the sum of reading of two wattmeter. 5

(B) The inductance of a moving iron ammeter is given by the expression : 5

$L = (10 + 50 \theta^2) \mu\text{H}$ Where θ is the angular deflection in radians from zero position. If the deflection for a current of 5A is 30° , find the angular deflection in radians for a current of 10 A. Also determine the spring constant.

Section - II

Q.4 (A) Derive the General Equation for Bridge Balance. 5

(B) Explain Maxwell's Bridge for measurement of self-inductance with vector diagram and also derive balance equation. 5

(C) Explain voltmeter-ammeter method for measurement of resistance. 5

OR

(C) Explain Inductance - Capacitance Bridge and Give the Advantage and Disadvantage of Inductance - Capacitance Bridge. 5

Q.5 (A) State advantage and limitation of wheatstone bridge also gives application of Wheatstone bridge. 5

(B) Discuss Kelvin double bridge for low resis. Measurement. 5

OR

(A) Which methods use for Measurement of high Resistance, Explain any one method. 5

(B) A Kelvin double bridge has each of the ratio arms $P=Q=p=q=1000\text{ohm}$. The e.m.f of the battery is 100v and resis. 50hm is included in the ckt. The galvanometer has a resis. Of 500ohm and the resis. Of the link connecting the unknown resis. To the standard resis. May be neglected. the bridge is balanced when standard resis. S-0.001ohm.

- (a) Determine value of unknown resis.
- (b) Determine the current through the unknown resis. And at balance.
- (c) Determine the deflection of the galvanometer when the unknown resis. R is changed by 0.1% from its value at balance.

The galvanometer has sensitivity of 200 mm/uA.

Q.6 (A) What is Ground Fault? Explain Murray loop test. 5

(B) derive balance condition for wien's bridge and write advantage and application for that. 5

OR

(A) What is Short Circuit Fault? Discuss the Varley loop test. 5

(B) In a maxwell's inductance comparison bridge arm ab consists of a coil with inductance L1 and resistance r1 in series with a non-inductive resistance R. the arm bc and ad are each of non-inductive resistance of 100ohm. Arm ad consists of standard variable inductor L2 of resistance 32.7ohm. balance is obtain when L2=47.8mh and R=1.36ohm. find resistance and inductance of the coil in arm ab. 5