

QUESTION BANK
ON
ELECTRICAL MEASUREMENT & INSTRUMENTATION



NILASAILA INSTITUTE OF SCIENCE & TECHNOLOGY
SERGARH-756060, BALASORE (ODISHA)
(Approved by AICTE & affiliated to SCTE&VT, Odisha)

ELECTRICAL MEASUREMENT & INSTRUMENTATION

BRANCH –ELECTRICAL ENGINEERING

SEMESTER -4th

SL.NO	TOPICS NAME	PAGE.NO
01	MEASURING INSTRUMENTS	3-3
02	ANALOG AMMETERS AND VOLT METERS	4-4
03	WATT METERS AND MEASUREMENT OF POWER	5-5
04	ENERGY METERS AND MEASUREMENT OF ENERGY	6-6
05	MEASUREMENT OF SPEED,FREQUENCY AND POWER FACTOR	7-7
06	MEASUREMENT OF RESISTANCE,INDUCTANCE AND CAPACITANCE	8-9
07	SENSORS AND TRANSDUCER	9-10
08	OSCILLOSCOPE	10-10

PREPARED BY :

ER. BISWAJIT PARIDA

(CHAPTER-1)

MEASURING INSTRUMENTS

1 Answer the following questions . (2 marks each)

- A) What is electrical measurement & instrumentation?
- B) Define accuracy ?
- C) What is deflecting torque ?
- D) What is controlling torque ?
- E) What is damping torque ?
- F) Define sensitivity ?
- G) What do you understand calibration of a measuring instrument ?
- H) Define tolerance ?
- I) Define resolutions ?

2. Answer the following questions . (5 marks each)

- A) Explain deflecting,controlling & damping torque in indicating type instrument.
- B) What are the errors in measuring instruments describe briefly.
- C) Explain the damping arrangement in indicating instruments .

3. Answer the following questions. (10 marks each)

- A) Briefly explain about the controlling torque.
- B) Explain about the air damping ,eddy current damping & fluid friction damping.
- C) Describe secondary instruments.

(CHAPTER-2)

ANALOG AMMETERS AND VOLT METERS

1 Answer the following questions . (2 marks each)

- A) What is analog type ammeters & volt meters ?
- B) What is the advantage of using shunt and multipliers ?
- C) What is the function of multimeter ?
- D) Why voltmeter is connected in parallel & ammeter in series with the load ?
- E) What is moving iron type instruments ?
- F) Define precision ?
- G) What is moving iron type instruments ?
- H) Define dynamometer ?
- I) What is PMMC ?

2. Answer the following questions . (5 marks each)

- A) Discuss about the PMMC instrument with sketch ?
- B) Explain the working principle of rectifier type instrument ?
- C) Describe the working principle of synchrosopes ?

3. Answer the following questions . (10 marks each)

- A) Explain the working principle of rectifier type instruments.
- B) Describe about the dynamometer instruments with neat sketch.
- C) Explain about the PMMC type instruments.
- D) Explain the induction type instruments.
- E) Explain about the MI type instruments with its principle of operation.

(CHAPTER-3)

WATT METERS AND MEASUREMENT OF POWER

1. Answer the following question . (2 marks each)

- A) What is multiplying factor is a watt meter ?
- B) Which type of damping system is used in case of permanent magnet moving coil ?
- C) What are the main advantages of permanent magnet moving coil instruments ?
- D) What is dynamometer type watt meter ?
- E) Define induction type watt meter ?
- F) What is precision ?

2. Answer the following question . (5 marks each)

- A) Explain error in wattmeter due to different correction ?
- B) Discuss dynamometer type watt meter ?
- C) State different types of errors in dynamometer type instruments for watt meter ?
- D) Explain measurement of 3-phase power of two watt meter method ?

3. Answer the following questions. (10 marks each)

- A) Explain the principle operation of dynamometer type watt meter.
- B) State the errors in dynamometer type watt meter.
- C) Briefly discuss about the induction type watt meter.
- D) Explain the LPF type watt meter.
- E) Explain the UPF type watt meter.

(CHAPTER-4)

ENERGY METERS AND MEASUREMENT OF ENERGY

1 Answer the following question . (2 marks each)

- A) What is energy meters ?
- B) Define induction type energy meters ?
- C) What is speed error energy meter ?
- D) What is the use of tachometer ?
- E) What is clam on ammeter ?
- F) Write the major cause of creeping in a single phase induction type energy meter ?
- G) How can you measure both ac and dc quantities ?

2. Answer the following questions. (5 marks each)

- A) Explain single phase induction type energy meter with neat & sketch diagram.
- B) What is speed error of energy meter and how it will be compensated.
- C) Describe the principle of single phase induction type energy meter.
- D) What is creeping error in energy meter and how it can be reduced.

3. Answer the following questions. (10marks each)

- A) Explain the principle & construction of single phase induction type energy meter.
- B) Explain the speed error of energy meter and it will be compensated.
- C) Describe the neat diagram explain the energy meter & derives the expression for deflecting torque.

(CHAPTER-5)

MEASUREMENT OF SPEED, FREQUENCY AND POWER FACTOR

1. Answer the following questions . (2 marks each)

- A) What is the use of tachometer ?
- B) What is phase sequence ?
- C) What is the use of tong tester ?
- D) Define tachometer ?
- E) Define dynamometer type single phase power factor meter ?
- F) What is 3-phase power factor meter ?

2. Answer the following questions . (5 marks each)

- A) Explain mechanical resonance type frequency meter.
- B) Explain dynamometer type single phase power factor meter .
- C) Describe the 3-phase power factor meter .
- D) Explain the working principles of tachometer.

3. Answer the following questions . (10marks each)

- A) Explain the construction and principle of single phase dynamometer type power factor meter.
- B) Describe the principle and operation of mechanical resonance type frequency meter .
- C) Explain the working principles of 3-phase power factor meter with proper diagram.
- D) Describe about tachometer .

(CHAPTER-6)

MEASUREMENT OF RESISTANCE, INDUCTANCE AND CAPACITANCE

1. Answer the following questions . (2 marks each)

- A) Name the different types of resistance ?
- B) What is the function of multimeter ?
- C) What is clamp-on ammeters ?
- D) What is Maxwell bridge method ?
- E) What is wheat stone bridge method ?
- F) What is megger ?

- G) What is analog multimeter ?
- H) Define schering bridge method ?
- I) State digital type multimeter ?
- J) Define resistance by potentiometer method ?

2. Answer the following questions . (5 marks each)

- A) Explain inductance measurement by Maxwell bridge method .
- B) Explain principle and operation of megger .
- C) Describe measurement of medium resistance by wheat stone bridge method.
- D) Briefly discuss about digital multimeter .
- E) Describe the measurement of capacitance by schering bridge method .

3. Answer the following questions . (10marks each)

- A) Explain measurement of high resistance by loss of charge method .
- B) Explain measurement of capacitance by L.C.R bridge method .
- C) Explain measurement of capacitance by De-sauty bridge method .
- D) Explain the construction and working principle of schering bridge method.
- E) Briefly explain about the Maxwell bridge method .

(CHAPTER-7)

SENSORS AND TRANSDUCER

1. Answer the following question . (2 marks each)

- A) What is transducer ?
- B) Define sensing element ?
- C) What is detector element ?
- D) What is transduction element ?
- E) What is resistive transducer ?
- F) Write linear potentiometer .
- G) What is angular motion potentiometer ?
- H) Define thermistor .
- I) What is strain gauge ?
- J) What is inductive transducer ?
- K) Write LVDT .

2. Answer the following questions. (5 marks each)

- A) Explain about the resistive transducer .
- B) Explain about thermistor .
- C) Describe the principle of strain gauge .
- D) Write general principle of capacitive transducer.

3. Answer the following questions. (10marks each)

- A) Explain the principle & construction of LVDT .
- B) Explain the inductive and capacitive transducer .
- C) Describe the piezo electric transducer and hall effect.
- D) Explain about thermistor and resistance thermometers.

(CHAPTER-8)

OSCILLOSCOPE

1. Answer the following question . (2 marks each)

- A) What is AC volatge ?
- B) What is cathode ray tube ?
- C) What is AC current ?
- D) What is frequency ?
- E) What oscilloscope ?

2. Answer the following questions. (5 marks each)

- A) Explain working principle of cathode ray tube .
- B) Describe the DC voltage,current & AC voltage,current,phase & frequency .

3. Answer the following questions. (10marks each)

- A) Explain the principle & construction of Oscilloscope.
- B) Explain operation of cathode Ray tube.