MCQ on Electrical Measuring Instruments with Answers Pdf

1. Which of the following indicating instrument, has/have linear scale ?

1. Moving iron meter.

2. PMMC meter.

3. Thermocouple meter.

4. Rectifier type meter.

Select the correct answer using code given below : Code:

(a) Only 1 and 2

(b) Only 2 and 3

(c) Only 3 and 4

(d) Only 2

Answer: (d) Only 2

2. Which of the following instruments will have poorest overloading capacity ?

(a) Moving coil instruments.

(b) Induction type instruments.

(c) Permanent magnet instruments.

(d) Hotwire instruments.

Answer: (d) Hotwire instruments.

3. Which of the following instrument is free from hysteresis and eddy current errors ?

(a) Moving iron instrument.

(b) Electrostatic instrument.

(c) Moving coil permanent magnet type instrument.

(d) Moving coil dynamometer type instrument.

Answer: (b) Electrostatic instrument.

4. Which voltmeter would you select for measuring 50,000 V direct current ?

(a) Moving coil voltmeter.

(b) Hot wire voltmeter.

(c) Electrodynamometer.

(d) Electrostatic voltmeter.

Answer: (d) Electrostatic voltmeter.

5. What is the correct sequence of the following types of ammeters and voltmeters with increasing accuracy ?

1. Moving iron.

2. Moving coil permanent magnet.

3. Induction.

Select the correct answer using the codes given below. Codes:

(a) 1, 3, 2

(b) 1, 2, 3

(c) 3, 1, 2

(d) 2, 1, 3

Answer: (c) 3, 1, 2

6. To increase current measurement range of an ammeter, it is
(a) shunted by a high resistance.

(b) put in series with a high resistance.

(c) put in series with a low resistance.

(d) shunted by a low resistance.

Answer: (d) shunted by a low resistance.

7. How can a milliammeter be used as a voltmeter ?
(a) By connecting a low resistance in parallel with the instrument.

(b) By connecting a high resistance in parallel with the instrument.

(c) By connecting a low resistance in series with the instrument.

(d) By connecting a high resistance in series with the instrument.

Answer: (d) By connecting a high resistance in series with the instrument.

8. The primary current in a CT is dictated by

(a) the secondary burden.

(b) the core of the transformer.

(c) the load current.

(d) none of the above.

Answer: (c) the load current.

9. The secondary of a CT is never left open-circuited because otherwise

(a) heat dissipation in the core will be very large.

(b) the core will be saturated and permanently magnetized rendering it useless.

(c) dangerously high emfs will be induced in the secondary.

(d) all of the above.

Answer: (d) all of the above.

10. Consider the following statements regarding the causes of error in current transformers.

1. Some exciting mmf is required by the primary winding to produce a flux.

2. The flux density in the core is not a linear function of the magnetizing force.

3. There is some magnetic leakage in the secondary winding.

4. There is significant power consumption in the metering circuit.

Of these statements

(a) 1 and 2 are correct.

(b) 1, 2 and 3 are correct.

(c) 2 and 4 are correct.

(d) 1, 3 and 4 are correct.

Answer: (d) 1, 3 and 4 are correct.

11. Consider the following statements : A current transformer is used for measurement of large currents to

1. isolate the instrument from a high voltage bus bar.

2. increase the accuracy of measurement.

3. decrease the cost of measuring arrangements.

4. extend the range of measurement of a conventional ammeter on ac.

Which of these statements are correct ?

(a) 1 and 2.

(b) 2 and 3.

(c) 3 and 4.

(d) 1 and 4.

Answer: (d) 1 and 4.

12. Instrument transformers are known to introduce magnitude and phase errors in measurements. These are primarily due to

(a) improper connections on the primary side.

(b) measurement errors inherent in the meter connected to the transformer secondary

(c) open and short circuit parameters of the instrument transformers.

(d) none of the above.

Answer: (c) open and short circuit parameters of the instrument transformers.

13. A current transformer has a phase error of 3°. The phase angle between the primary and secondary currents is

(b) 3°

(b) 177°

(c) 180°

(d) 183°

Answer: (b) 177°

14. What is clamp-on ammeter used for ?

(a) Low ac current.

(b) High ac current.

(c) Low dc current.

(d) High dc current.

Answer: (b) High ac current.

15. In case of a PT with the increase in load on secondary side

(a) both of the ratio error and phase angle increase.

(b) the ratio error increases but phase angle decreases.

(c) the ratio error decreases but phase angle increases.

(d) both of the ratio error and phase angle error decrease.

Answer: (a) both of the ratio error and phase angle increase.

16. The moving coil in a dynamometer wattmeter is connected

(a) in series with the fixed coil.

(b) across the supply.

(c) in series with the load.

(d) across the load.

Answer: (b) across the supply.

17. Dynamometer type wattmeters are suitable for

(a) both ac and dc circuits.

(b) only ac circuits.

(c) only dc circuits.

(d) only high voltage ac circuits.

Answer: (a) both ac and dc circuits.

18. The pressure coil of a dynamometer type wattmeter is

(a) highly inductive.

(b) highly resistive.

(c) purely resistive.

(d) purely inductive.

Answer: (b) highly resistive.

19. In a statement "the wattmeter commonly used for power measurement at commercial frequencies is of the X type. This meter consists of two coil systems, the fixed system being the Y coil and the moving system being the Z coil " X, Y and Z stand respectively for

(a) dynamometer, voltage and current.

(b) dynamometer, current and voltage.

(c) induction, voltage and current.

(d) induction, current and voltage.

Answer: (b) dynamometer, current and voltage.

20. A dynamometer type wattmeter responds to the
(a) average value of active power.

(b) average value of reactive power.

(c) peak value of active power.

(d) peak value of reactive power.

Answer: (a) average value of active power.

21. Which one of the following is the correct statement ? Due to inductance in the pressure coil the dynamometer wattmeter
(a) reads low on lagging pf and high on leading pf.

(b) reads high on lagging pf and low on leading pf.

(c) reading is not affected at all.

(d) always reads low.

Answer: (b) reads high on lagging pf and low on leading pf.

22. Due to the effect of inductance in the pressure coil, a dynamometer type wattmeter

(a) reads low on lagging power factor and high on leading power factor.

(b) reads high on lagging power factor and low on leading power factor.

(c) reading is independent of the power factor.

(d) always reads lower than the actual value.

Answer: (b) reads high on lagging power factor and low on leading power factor.

23. In a low pf wattmeter the compensating coil is connected

(a) in series with the current coil.

(b) in series with the pressure coil.

(c) across the current coil.

(d) across the potential coil.

Answer: (b) in series with the pressure coil.

24. Consider the following statements:

(i) The compensating coil of a low power factor wattmeter compensates the effect of the impedance of the current coil.

(ii) The compensating coil of a low power factor wattmeter compensates the effect of the impedance of the voltage coil circuit.

(a) (i) is true but (ii) is false.

(b) (i) is false but (ii) is true.

(c) both (i) and (ii) are true.

(d) both (i) and (ii) are false.

Answer: (b) (i) is false but (ii) is true.

25. In a low power factor wattmeter, why is a compensating coil employed ?

(a) To neutralize the capacitive effect of pressure coil.

(b) To compensate for inductance of pressure coil.

(c) To compensate for the error caused by power loss in the pressure coil.

(d) To compensate for the error caused by eddy currents.

Answer: (c) To compensate for the error caused by power loss in the pressure coil.

26. The error caused by pressure coil inductance in a wattmeter is compensated by connecting a

(a) capacitor across a part of series resistance in the pressure coil circuit.

(b) capacitor in series with the series resistance in the pressure coil circuit.

(c) capacitor across a part of a series inductor in the pressure coil circuit.

(d) capacitor in series with the series inductor in the pressure coil circuit.

Answer: (a) capacitor across a part of series resistance in the pressure coil circuit.

27. Electrodynamic type wattmeter have large errors while measuring power in ac circuits at low power factor conditions, since the voltage across and the current through the

(a) current coil are not in phase.

(b) current coil are not in quadrature.

(c) pressure coil are not in phase.

(d) pressure coil are not in quadrature.

Answer: (c) pressure coil are not in phase.

28. The current and potential coils of a wattmeter were accidentally interchanged while connecting. After energizing the circuit, it was observed that the wattmeter did not show the reading. This could be due to

(a) damage to the potential coil.

(b) damage to the current coil.

(c) damage to both potential and current coils.

(d) loose contact.

Answer: (b) damage to the current coil.

29. The magnetic field responsible for the production of the deflecting torque in an accurate dynamometer type wattmeter, being very weak, the 'accuracy of the measurement can be increased by providing a

(a) Magnetic shield around the instrument.

(b) Compensating winding along with the pressure coil.

(c) Astatic arrangement to the moving system of the instrument.

(d) Capacitance shunt across a portion of the pressure coil.

Answer: (c) Astatic arrangement to the moving system of the instrument.

30. Which one of the following methods decreases the error due to connections in a dynamometer type wattmeter ?

(a) Using bifilar compensating winding in place of current coil.

(b) Using non-inductive pressure coil circuit.

(c) Using a capacitor across a part of high resistance of pressure coil circuit.

(d) Using a swamping resistance.

Answer: (a) Using bifilar compensating winding in place of current coil.

31. How can the power supplied to a frequency heating system be measured?

(a) By dynamometer wattmeter.

(b) By induction wattmeter.

(c) By thermocouple type wattmeter.

(d) By moving iron ammeter and voltmeter.

Answer: (c) By thermocouple type wattmeter.

32. In the power measurement by ammeter-voltmeter method, if the voltmeter is connected across the load, then the value of the power will be

(a) the power consumed by the load.

(b) the sum of power consumed by the load and ammeter.

(c) the sum of power consumed by the load and voltmeter.

(d) the sum of power consumed by the load, ammeter and voltmeter.

Answer: (c) the sum of power consumed by the load and voltmeter.

33. In calibration of dynamometer wattmeter by potentiometer, phantom loading arrangement is used because

(a) the arrangement gives accurate results.

(b) the power consumed in calibration work is minimum.

(c) the method gives quick results.

(d) the on site calibration is possible.

Answer: (b) the power consumed in calibration work is minimum.

34. The two wattmeter method is used to measure active power on a three-phase, three-wire system. If the phase voltage is unbalanced, then the power reading is

(a) affected by both negative sequence and zero sequence voltages.

(b) affected by negative sequence voltages but not by zero sequence voltages.

(c) affected by zero sequence voltages but not by negative sequence voltages.

(d) not affected by negative or zero sequence voltages.

Answer: (d) not affected by negative or zero sequence voltages.

35. In the case of power measurements by the two wattmeter method in a balanced 3-phase system with a pure inductive load,

(a) both the wattmeters will indicate the same value but of opposite sign.

(b) both the wattmeters will indicate zero.

(c) both the wattmeters will indicate the same value and of the same sign.

(d) one wattmeter will indicate zero and the other will indicate some non zero value.

Answer: (a) both the wattmeters will indicate the same value but of opposite sign.

36. If the power factor is below 0.5 in two wattmeter method of power measurement

(a) one of the wattmeter will give negative deflection.

(b) both the wattmeters will give negative deflection.

(c) both the wattmeters will give positive deflection.
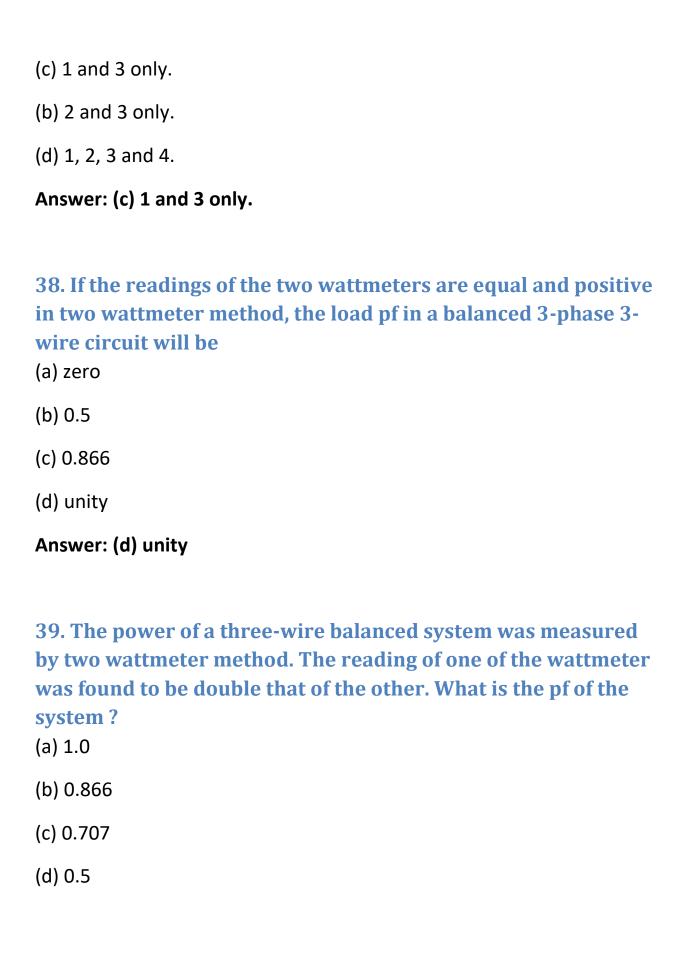
(d) both the wattmeters will not give any deflection.

Answer: (a) one of the wattmeter will give negative deflection.

37. Consider the following statements regarding measurement of 3-phase power by two-wattmeter method; one of the wattmeter reads negative implying:

1. Power factor is less than 0.5.

2. Power flow is in the reverse direction.

3. Load power factor angle is greater than 60°.

4. Load is unbalanced.

Which of the above statements are correct?

(a) 1 and 2 only.

(c) 1 and 3 only.

(b) 2 and 3 only.

(d) 1, 2, 3 and 4.

Answer: (c) 1 and 3 only.

38. If the readings of the two wattmeters are equal and positive in two wattmeter method, the load pf in a balanced 3-phase 3-wire circuit will be

(a) zero

(b) 0.5

(c) 0.866

(d) unity

Answer: (d) unity

39. The power of a three-wire balanced system was measured by two wattmeter method. The reading of one of the wattmeter was found to be double that of the other. What is the pf of the system ?

(a) 1.0

(b) 0.866

(c) 0.707

(d) 0.5

Answer: (b) 0.866

40. Which of the following statements are correct in case of a power factor meter ?

1. The deflection is proportional to the phase angle between field coil and crossed coil.

2. The restoring torque is provided by a controlling torque.

3. It consists of two coils mounted at right angles to each other.

Select the correct answer using the code given below :

(a) 1 and 2.

(b) 2 and 3.

(c) 1 and 3.

(d) 1, 2 and 3.

Answer: (c) 1 and 3.

41. Consider the following statements regarding the controlling torque:

1. It is not present in power factor meter.

2. It opposes the deflecting torque.

3. It is provided by air friction or by fluid friction.

Which of these statements are correct?

(a) 1, 2 and 3.

(b) 1 and 3 only.

(c) 2 and 3 only.

(d) 1 and 2 only.

Answer: (d) 1 and 2 only.

42. Which of the following statements is correct?

(a) Dynamometer type synchroscope is more commonly used as it is more accurate than moving iron type.

(b) The moving iron synchroscope is more commonly used as it is cheap in cost, robust in construction and suitable for continuous operation.

(c) Weston type synchroscope is more commonly used as it is cheap in cost and robust in construction.

(d) none of the above.

Answer: (b) The moving iron synchroscope is more commonly used as it is cheap in cost, robust in construction and suitable for continuous operation.

43. Low resistors are provided with four terminals in order to

(a) eliminate the thermoelectric emf effect.

(b) facilitate the connection of current and voltage circuits.

(c) make the resistance value definite irrespective of the nature of contacts at the current terminals.

(d) eliminate the effect of connecting leads.

Answer: (d) eliminate the effect of connecting leads.

44. For low resistance (from few micro ohms to one ohm) measurement, which bridge is used ?

(a) Wheatstone bridge.

(b) Kelvin bridge.

(c) Guarded Wheatstone bridge.

(d) Maxwell bridge.

Answer: (b) Kelvin bridge.

45. Which one of the following bridges will be used for the measurement of very low resistance?

(a) Kelvin bridge.

(b) Maxwell's bridge.

(c) Wheatstone bridge.

(d) Hay's bridge.

Answer: (a) Kelvin bridge.

46. The accuracy of Kelvin's double bridge for the measurement of low resistance is high because the bridge

(a) uses two pairs or resistance arms.

(b) has medium value resistances in the ratio arms.

(c) uses a low resistance link between standard and test resistances.

(d) uses a null indicating galvanometer.

Answer: (a) uses two pairs or resistance arms.

47. In a Kelvin's double bridge two sets of readings are taken when measuring low resistance, one with current in one direction and the other with direction of current reversed. This is done to

(a) eliminate the effect of contact resistance.

(b) eliminate the effect of resistance of leads.

(c) correct for the effect of changes in battery voltage.

(d) eliminate the effect of thermoelectric emfs.

Answer: (d) eliminate the effect of thermoelectric emfs.

48. A Wheatstone bridge cannot be employed for measurement of very low resistance as it introduces error on account of

(a) contact resistance.

(b) resistance of connecting leads.

(c) thermoelectric emfs.

(d) all of the above.

Answer: (d) all of the above.

49. In measurement of resistance by Carey Foster bridge no error is introduced due to

(a) contact resistance.

(b) connecting leads.

(c) thermoelectric emfs.

(d) all of these.

Answer: (d) all of these.

50. The sensitivity of a Wheatstone bridge depends upon

(a) galvanometer current sensitivity.

(b) galvanometer resistance.

(c) bridge supply voltage.

(d) all of the above.

Answer: (d) all of the above.

51. High resistances are provided with a guard terminal in order to

(a) protect the resistance against stray electrostatic field.

(b) bypass the leakage current.

(c) protect the resistance against overloads.

(d) protect the resistance against stray electromagnetic field.

Answer: (b) bypass the leakage current.

52. A high resistance cannot be measured by simple ammeter-voltmeter principle because

(a) voltmeter rating will be too high.

(b) ammeter rating will be too low.

(c) leakage current cannot be neglected.

(d) power loss will be high.

Answer: (c) leakage current cannot be neglected.

53. When a capacitor was connected to the terminal of an ohmmeter the pointer indicated a low resistance initially and then slowly came to infinity position. This shows that the capacitor is

(a) short-circuited.

(b) all right.

(c) open-circuited.

(d) weak.

Answer: (b) all right.

54. The shunt type ohmmeter is not suitable for high resistance measurements because

(a) very low resistance of the meter would short the high unknown resistance.

(b) scale is highly cramped for high resistance values.

(c) full scale value of the meter may be exceeded.

(d) battery cannot supply the necessary current for proper meter deflection.

Answer: (b) scale is highly cramped for high resistance values.

55. Which one of the following is measured by the loss of charge method ?

(a) Low R.

(b) High R.

(c) Low L.

(d) High L.

Answer: (b) High R.

56. Low resistance from few ohms down to one micro-ohm is measured using which one of the following statements ?

(a) Ohmmeter.

(b) A series type ohmmeter.

(c) A shunt type ohmmeter.

(d) A voltmeter and an ammeter.

Answer: (d) A voltmeter and an ammeter.

57. The resistance of a shunt for a precision grade ammeter can be best measured by

(a) De Sauty bridge.

(b) Schering bridge.

(c) Maxwell bridge.

(d) Kelvin double bridge.

Answer: (d) Kelvin double bridge.

58. The Wheatstone bridge method of resistance measurements ideally suitable for the measurement of resistance values in the range of

(a) 0.001 Ω to 1 Ω

(b) 0.1 Ω to 100 Ω

(c) 100 Ω to 10 kΩ

(d) 100 kΩ to 10 MΩ

Answer: (b) 0.1 Ω to 100 Ω

59. The maximum sensitivity of a Wheatstone bridge is achieved when the bridge

(a) uses dc supply.

(b) uses ac supply.

(c) has unity arm ratio.

(d) has 1 : 2 arm ratio.

Answer: (c) has unity arm ratio.

60. The potentiometer is standardized for making it

(a) accurate.

(b) precise.

(c) accurate and direct reading.

(d) accurate and precise.

Answer: (c) accurate and direct reading.

61. In dc potentiometer measurements, a second reading is often taken after reversing the polarities of dc supply and the unknown voltage, and the average of the two readings is taken. This is done to eliminate the effects of

(a) ripples in, the dc supply.

(b) stray magnetic fields.

(c) stray thermal emfs.

(d) erroneous standardization.

Answer: (c) stray thermal emfs.

62. Consider the following statements. DC potentiometer is the best means available for measurement of dc voltages because

1. The precision in measurement is independent of the type of detector used.

2. It is based on null-balance technique.

3. It is possible to standardize before a measurement is undertaken.

4. It is possible to measure dc voltages ranging in value from mV to hundreds of volts.

Of these statements

(a) 2 and 3 are correct.

(b) 1 and 4 are correct.

(c) 2 and 4 are correct.

(d) 3 and 4 are correct.

Answer: (c) 2 and 4 are correct.

63. Maxwell inductance bridge is used for coils of Q value

(a) less than 1.

(b) less than 10.

(c) greater than 1 and less than 10.

(d) more than 100.

Answer: (c) greater than 1 and less than 10.

64. In an Anderson bridge, the unknown inductance is measured in term of known

(a) resistance.

(b) capacitance.

(c) inductance and resistance.

(d) resistance and capacitance.

Answer: (d) resistance and capacitance.

65. Hay's bridge is suitable for the measurement of which one of the following ?

(a) Inductance with Q < 10.

(b) Inductance with Q > 10.

(c) Capacitance with high dissipating factors.

(d) Capacitance with low dissipating factors.

Answer: (b) Inductance with Q > 10.

66. Which of the following bridges can be used for inductance measurement ?

1. Maxwell bridge.

2. Hay's bridge.

3. Wein bridge.

4. Wheatstone bridge.

Select the correct answer using the code given below:

(a) 1 and 2

(b) 2 and 3

(c) 3, 4 and 5

(d) 1 and 4

Answer: (a) 1 and 2

67. Inductance is measured by which one of the following?

(a) Wien bridge.

(b) Schering bridge.

(c) Maxwell bridge.

(d) Owen bridge.

Answer: (c) Maxwell bridge.

68. An imperfect capacitor is represented by a capacitance C in parallel with a resistance R. The value of the dissipation factor tan δ is

(a) ωCR

(b) $\omega^2 CR$

(c) $1/\omega^2 CR$

(d) $1/\omega CR$

Answer: (a) ωCR