Electrical and electronics Measurements MCQs for Electrical Engineering

01 – Fundamental Of Measurement

Content of Chapter:-

1.1 Measurement: signi cance, unit. Fundamental quantities and standards.

1.2 Instruments: absolute & secondary instruments, analog and digital instruments, mechanical, electrical and
electronic instruments.

1.3 Static and Dynamic characteristics, types of error.

1.4 Calibration: need and procedure.

1. In a measuring instrument, dead space is de ned as the

a. Range of di erent input values over which there is no change in output values

b. Range of di erent output values for the same input values

c. Either (a) or (b)

d. None of these

2. In a spring controlled type indicating instruments, if the controlling torque is equal to the de ecting torque then

a. Angle of de ection will be maximum

b. Current owing through it will be maximum

c. Angle of de ection will be zero

d. Angle of de ection will be directly proportional to the current owing through it.

3. In measuring instruments, spiral springs are provided to

a. Lead current
b. Produce controlling torque
c. Produce damping torque
d. Lead current and produce controlling torque

4. In an electrodynamic instrument, the number of control springs present is / are
a. **Two** b. One
c. Four d. Zero

5. A moving iron instrument can be used for
a. D.C.only b. A.C.only
c. Both D.C. and A.C. d. None of the above

6. The gravity controlled instrument has crowded scale because current is proportional to
a. Balancing weight b. Deflection angle
c. Sine of deflection angle d. None of these.

7. Systematic errors are
a. Instrumental errors
b. b. Environmental errors
c. Observational errors
d. All of the above

8. 25.The electrical power to a Megger is provided by

a. Battery

b. Permanent magnet D.C. generator

c. A.C.generation

d. Any of the above

9. For measuring a very high resistance we should use

a. Kelvin's double bridge

b. b. Wheat stone bridge

c. Megger

d. None of the above

10. The function of shunt in an ammeter is to

a. By pass the current

b. Increase the sensitivity of the ammeter.

c. Increase the resistance of ammeter.

d. None of the above.

11. _____instruments are those which measure the total quantity of electricity delivered in a particular time.

a. Absolute

b. Indicating

c. Recording

d. Integrating

12.A_____device prevents the oscillation of the moving system and enables the latter to reach its final position quickly

a. Deflecting

b. Damping

c. Controlling d. None of the above

13. The electrical power to a Megger is provided by

a. Battery

b. Permanent magnet D.C. generator

c. A.C.generation

d. Any of the above

14. Two holes in the disc of energy meter are drilled at the opposite sides of the spindle to

a. Improve its ventilation

b. Eliminate creeping at no load.

c. Increase its deflecting torque

d. Increase its braking torque

15. The pointer of an indicating instrument should be

a. Very light

b. Very heavy

c. Either A OR B

d. Neither A nor B.

16. Which of the following devices may be used for extending the range of instruments?

a. Shunts

b. Multipliers

c. Current transformers

d. All of the above.

17. The ratio of maximum displacement deviation to full scale deviation of the instrument is called

a. Static sensitivity

b. Dynamic deviation

c. Linearity

d. Precision or accuracy

18. An ammeter is a

a. Secondary instrument

b. Absolute instrument

c. Recording instrument

d. Integrating instrument

19. A multi-range instrument has

a. Multiple shunt or series resistances inside the meter

b. Multi-coil arrangement

c. Variable turns of coil

d. Multi range meters inside the measurement system.

20.A moving coil instrument has a resistance of 10 Ω and gives full scale deflection at 0.5 V potential difference across it. How can it be adapted to measure a current upto 100 A?

a.by connecting shunt resistance of 0.005 Ω across the meter (Ans.)

b.by connecting shunt resistance of 0.05 Ω across the meter

c.by connecting shunt resistance of 5 Ω across the meter

d.by connecting shunt resistance of 10 Ω across the meter.

21. In indicating instruments the springs are mainly used to

a. conduct the current to the coils

b. hold the pivot in position

c. control the pointer movement (Ans.)
d. reduce the vibration of the pointer

22. In hot wire instrument, the sensing wire is made of
a. Copper b. Silver
c. Platinum-iridium
d. Copper-Nickel

23. An ammeter is inserted in _____
1. **Series in a circuit and current to be measured flows through it**
2. Series in a circuit and part of the current to be measured flows through it
3. Parallel in a circuit and current to be measured flows through it
4. Parallel in a circuit and only part of the current to the measured flows through it.

24. An ammeter is convertible to a voltmeter by
1. Changing the scale
2. Putting a large resistance in parallel with the actual measuring part of the instrument
3. Putting a large resistance in series with the actual measuring part of the instrument
4. Simply installing the instrument in parallel with the circuit

25. Which of the following material will be preferred as a shunt for extending the range of measurement of a voltmeter?
1. Copper
2. Steel
3. Aluminum
4. Manganin

26. What should be the size of the slide wire of the potentiometer to make it to achieve high accuracy?
1. **As long as possible**
2. As short as possible
3. 1 meter
4. Neither too thin nor too thick.

27. A resistance of 75 Ohms is connected in shunt of a galvanometer, having an internal resistance of 25 Ohms, to convert it into an ammeter. What is the value of current (in A) flowing through the galvanometer, if the total current in the circuit is 5 A?

1. 2
2. 2.5
3. 3.65
4. **3.75.**

28. A moving coil milli ammeter having a resistance of 10 ohms gives full-scale deflection when a current of 5 mA is passed through it. If the instrument is to be used to measure current upto 1 A.

1. A resistance of 0.502 Ω must be connected in series with the instrument
2. A resistance of 0.502 Ω must be connected in parallel to the load
3. **A resistance of 0.502 Ω must be connected parallel with the resistance of the ammeter**
4. A resistance 0.50 Ω must be connected in series with the load

Formulae: $Rs = ImRm/(I - Im) = (0.005 \times 10)/(1 - 0.005$

29. A PMMC type voltmeter, having a full-scale reading of 250 V and an internal resistance of 400 kiloohms, is connected with the series resistance of 100 kilo-ohms. Calculate the sensitivity of the voltmeter (in Ohms/Volts).

1.2400
2. **2000**
3.20000
4.24000

Sensitivity (S) = (Rm + Rs)/Vfd

30. In eddy-current damping systems, the disc is usually made of

1. Non-conducting and Non-magnetic material.
2. Non-conducting and magnetic material.
3. Conducting and magnetic material.
4. **Conducting and Non-magnetic material.**

31. A repulsion type ammeter when used on A.C circuit reads

1. Peak value of current
2. **R.M.S value of the current**
3. Mean value of current
4. Equivalent D.C value of the current

32. Eddy current damping is not used on repulsion type instrument because

1. **The presence of a permanent magnet required for damping would affect the deflection and hence the reading of the instrument**
2. The presence of permanent magnet will result in overheating of the coil
3. An uneven scale will be required and the instrument will require calibration every time
4. Excessive vibrations will result in the disc due to eddy; currents, thereby affecting its accuracy.

33. The error due to hysteresis in moving iron type instrument is minimized by using

1. **Stainless steel**

2. High speed steel
3. Silver coating
4. Perm alloy

34. If damping torque is not provided in an instrument
1. An instrument will show full wave of qua ntity even under small values
2. The pointer will move only when full rated load is provided
3. The pointer will oscillate about its final deflected position and will never come to rest even under steady conditions
4. The pointer will oscillate about its final deflected position for quite sometime before coming to rest

35. When the damping of an instrument is adjusted to enable the pointer to rise quickly to its deflected position without overshooting in that case the instrument is said to be
1. **Dead beat**
2. Off-Beat
3. Over damped
4. Under damped

36. When the damping force is more than the optimum, the instrument will become
1. Dead
2. Oscillating
3. Slow and lethargic
4. Fast and sensitive

37. In moving iron type ammeter the coils has
1. A large number of turns of thick wire
2. Large number of turn of thin wire
3. Few turns of thin wire
4. Few turns of thick wire

38. In repulsion type instrument the force of repulsion is approximately proportional to
1. Current
2. Square of current
3. The inverse of the current
4. The inverse of the square of the current

39. In moving iron type instrument because of the hysteresis in the iron parts of the moving system the reading is
1. **Higher on descending value but lower on ascending values**
2. Higher on ascending values but lower and descending values
3. Higher on the both ascending as well as descending values
4. Lower on the both ascending as well as descending values

40. Which of the following statements is incorrect about the hot wire instruments?

1. Their reading is independent of the wave form
2. Their reading is independent of frequency
3. They are unaffected by stray fields
4. **Their response is instantaneous.**

41. Voltmeter sensitivity is defined as

1. **Reciprocal of the full-scale deflection current**
2. Volts per ohm
3. Ohms per volts
4. Its degree of sensitiveness to impulse change

UNIT:-2

Content of Chapter:-

2.1 Analog meter: PMMC and PMMI, construction, working and salient features.

2.2 DC Ammeters: basic, multi-range, universal shunt.

2.3 DC voltmeters: basic, multi-range, simple numerical concept of loading effect and sensitivity.

2.4 AC voltmeter: rectifier type (half and full wave)

2.5 Ohm meter: Series and shunt.

2.6 Clamp-on meter.

2.7 DC voltmeters: basic, multi-range, simple numerical concept of loading effect and sensitivity.

2.8 AC voltmeter: rectifier type (half and full wave)

2.9 Ohm meter: Series and shunt.

2.10 Clamp-on meter.

1. Moving iron and PMMC instruments can be distinguished from each other by looking at:
a. Pointer
b. Terminal size
c. **Scale**
d. Scale range

2. Preferred material for permanent magnet is:
a. Stainless steel
b. **b. Alnico**
c. Tungsten steel
d. Soft iron

3. Air -friction damping is used in the instruments which is:
a. Moving iron
b. **b. Moving coil**
c. Induction
d. Hot wire

4. PMMC instrument gives uniform scale because:
a. It uses spring control
b. It uses eddy current damping
c. The deflection torque is proportional to the instrument current
d. **Both (a) and (c)**

5. An instrument that is capable of measuring only dc is;
a. Moving coil
b. **b. Moving iron**
c. Thermo couple
d. None of the above

6. Ohmmeter is basically
a. **An Ammeter**
b. b. A Voltmeter
c. A Multimeter
d. None of the above

7. Which of the following are integrating instruments ?
(a) Ammeters
(b) Voltmeters
(c) Wattmeter's
(d) Ampere-hour and watt-hour meters

8. The spring material used in a spring control device should have the following property.
(a) Should be non-magnetic
(b) Most be of low temperature co-efficient
(c) Should have low specific resistance

(d) Should not be subjected to fatigue

(e) All of the above.

9. For handling greater currents induction wattmeter are used in conjunction with .....

1. potential transformer

2. current transformer

3. power transformer

4. all of the above

10. An instrument's reliability means

a. The extent to which the characteristics remain linear

b. The life of the instrument

c. The degree to which the repeatability continues to remain within specific limits

d. All of the above

11. Moving parts of instruments are supported in ..... bearings

a. Jeweled

b. Ball

c. Roller

d. Bush

12. The meter constant of single phase energy meter is expressed in terms of

A. Revolutions/kWh

B. kW/kWh

C. Amps/Kw

D. Volts/kWh

13. A balanced three-phase star-connected load draws power from a 440 V supply. The two connected watt meters, W1 and W2, indicate 5 kW and 1200 W. Calculate the total power.

1. 5 kW

2. 6,200 kW

3. 62 kW

4. 6,200 W

14. The reading on the ammeters connected for the three ammeter method of power measurement is 2.0 A, 4A and 6A in the non-inductive resistor, the load and the main respectively. The terminal voltage is 300V. The non-inductive resistance of the load is

1. **150 ohms**
2. 75 ohms
3. 50 ohms
4. 25 ohms

15. A clamp-on ammeter measures current flow by using:

a. Shunting current through a mili-ammeter

b. Differential current flow between two conductors

c. A basic transformer principle

d. A portion of circuit resistance

16. In measurement, what do you call the degree of exactness compared to the expected value of the variable being measured?

A. precision

B. accuracy

C. sharpness

D. correctness

17. In measurements, the sum of a set of numbers divided by the total number of pieces of data in the given set is called

A. geometric mean

B. algebraic mean

C. arithmetic mean

D. effective value

18. When an instrument is subjected to harsh environments such as high temperature, strong magnetic, electrostatic or electromagnetic field, it may have detrimental effects and cause errors known as

A. Observational errors

B. Environmental errors

C. Instrument errors

D. Gross errors

19. Errors introduced by the observer or user.

A. Observational errors

B. Environmental errors

C. Instrument errors

D. Gross errors

20. Errors in analog meter reading due to your physical position with respect to the meter scale.

A. parallax error

B. angular error

C. linear error

D. deviation

21. What do you call the difference between any number within the set of numbers and the arithmetic mean of that set of numbers?

A. parallax error

B. angular error

C. linear error

D. deviation

21. An instrument or device having recognized permanent or stable value that is used as a reference.

A. standard instrument/device

B. reference instrument/device

C. fixed instrument/device

D. ideal instrument/device

22. A permanent-magnet moving-coil instrument.
A. induction instrument
B. D'Arsonval meter movement
C. moving-iron instrument
D. moving-magnet instrument

23. An instrument which depends on current in one or more foxed-coils acting on one or more pieces of soft iron, at least one of which is movable.
A. moving-magnet instrument
B. moving-iron instrument
C. D'Arsonval meter movement
D. induction instrument

24. The smallest change in a measured variable to which an instrument will respond.
A. quantize value
B. resolution
C. minimum
D. step size

25. A device or mechanism used to determine the value of a quantity under observation.
A. measuring kit
B. evaluator
C. instrument
D. sensor

26. What is the basic unit for measuring current flow?
A. coulomb
B. ampere
C. atomic weight
D. volt

27. An instrument used to detect and measure the presence of electrical current is generally called
A. D'Arsonval meter
B. electrodynamometer
C. galvanometer
D. potentiometer

28. What is the common type of meter movement?
A. Fixed coil
B. Farad
C. D'Arsonval
D. Digital

29. What is that device, which depends on the action of a movable permanent magnet, in aligning itself in the resultant field, produced either by a fixed permanent magnet and adjacent coil or coils carrying current, or by two or more current-carrying coils whose axes are displaced by a fixed angle?

A. D'Arsonval meter movement

B. induction instrument

C. moving-magnet instrument

D. moving-iron instrument

30. What ammeter is mostly used in measuring high-frequency currents?

A. electrostatic

B. moving-coil

C. dynamometer

D. thermocouple

31. Measurement of high dc-voltages is usually done by using

A. Electrostatic

B. moving-coil

C. dynamometer

D. thermocouple

32. Measuring instrument that can be used only to measure voltages.

A. electrostatic

B. thermocouple

C. dynamometer

D. permanent-magnet moving-coil

33. This instrument measures temperatures by electric means, especially temperatures beyond the range of mercury thermometers.

A. pyrometer

B. electrostatic instrument

C. moving-magnet instrument

D. permanent-magnet moving-coil instrument

34. This instrument refers to that one, which measures the intensity of the radiation, received from any portion of the sky.

A. megaohmmeter

B. pyranometer

C. Megger

D. galvanometer

35. What is the normal indication on a megger (megohmmeter) when checking insulation?

A. one

B. infinity

C. middle of scale

D. zero

36. Resistance measuring instrument particularly used in determining the insulation resistance.

A. mega ohmmeter

B. Megger

C. galvanometer

D. A or B are correct

37. An electrodynamic meter is used to measure power

A. hook-on type voltmeter

B. wattmeter

C. watt-hour meter

D. multi-meter

38. A device used to mechanically measure the output power of a motor.

A. dynamometer

B. Megger

C. concentric-vane instrument

D. radial-vane instrument

UNIT:-3

– Measurement of Electric power

Content of Chapter:-

3.1 Dynamometer type wattmeter: construction and working

3.2 Range Multiplying factor and extension of range.

3.3 Errors and compensating

3.4 Active and reactive power measurement: one, two and three wattmeter method.

3.5 Effect of power factor on wattmeter reading in two wattmeter method.

3.6 Maximum demand Indicator.

3.7 Four quadrant meter

3.8 **phase Sequence**.

1. A dynamometer type wattmeter has

(A) Square law scale (B) Non-linear scale

(C) Logarithmic scale (D) Uniform scale

Answer: - Option D

2. Which of the following methods is used to shield a dynamometer type wattmeter against stray fields?

(A) Meter components are made of non-magnetic materials (B) Meter is housed in a soft iron case

(C) Neutral wire connection is provided (D) Meter is earthed

Answer: - Option B

3. A wattmeter will be free from the effects of power factor and frequency variations in case

A. Voltage coil resistance is zero
B. Damping is not provided
C. Pressure coil inductance is zero
D. A capacitance is connected in parallel to pressure coil
Answer: - Option A

4. The minimum number of wattmeter's required to measure power in an unbalanced three-wire system is

(A) One (B) Two
(C) Three (D) Four
Answer: - Option B

5. An induction wattmeter measures

A. Only the true power
B. The reactive power
C. The apparent power
D. The true power and the reactive power
Answer: - Option A

6. The resistance in the circuit of the moving coil of a dynamometer wattmeter should be

A. Almost zero
B. Low
C. High
D. None of the above
Answer: - Option C

7. A dynamometer wattmeter can be used for

A. Both D.C. and A.C.
B. D.C. only
C. A.C. only
D. Any of the above
Answer: - Option A

8. The pressure coil of a wattmeter should be connected on the supply side of the current coil when

(A) Load impedance is high
(B) Load impedance is low
(C) Supply voltage is low
(D) None of the above
Answer:-Option A

9. In a low power factor wattmeter the pressure coil is connected

A. To the supply side of the current coil

B. To the load side of the current coil
C. In any of the two meters at connection
D. None of the above
Answer: - Option B

10. In a low power factor wattmeter the compensating coil is connected
A. In series with current coil
B. In parallel with current coil
C. In series with pressure coil
D. In parallel with pressure coil
Answer: Option C

11. The power consumed in a circuit element will be least when the phase difference between the current and voltage is
(A) 180°
(B) 90°
(C) 60°
(D) 0°
Answer: - Option B
Explanation: -Power=V*I*cos Φ=V*I*cos(90)=0

12. In a 3-phase power measurement by two wattmeter method, both the wattmeter's had identical readings. The power factor of the load was
A. Unity
B. 0.8 lagging
C. 0.8 leading
D. Zero

13. In a 3-phase power measurement by two wattmeter method the reading of one of the wattmeter was zero. The power factor of the load must be
A. Unity
B. 0.5
C. 0.3
D. Zero
Answer: - Option B

14. Wattmeter cannot be designed on the principle of
A. Electrostatic instrument
B. Thermocouple instrument
C. Moving iron instrument
D. Electrodynamic instrument
Answer: - Option C

15. The readings of a dynamometer type wattmeter can be highly erratic a
A. Low frequencies
B .Fluctuating loads
C .Low power factors

D. High voltages

Answer: - Option C

16. In L-C connected wattmeter, compensated coil is used. The error in the wattmeter is due to power consumed by the

a. Current coil

b. Potential coil

c. Inductor

d. Capacitor

Answer: - Option B

17. in any A.C. circuit always

(A) Apparent power is more than actual power

(B) Reactive power is more than apparent power

(C) Actual power is more than reactive power

(D) Reactive power is more than actual power

Answer: Option A

18. Magnitude of current at resonance in R-L-C circuit

(A) Depends upon the magnitude of R

(B) Depends upon the magnitude of L

(C) Depends upon the magnitude of C

(D) Depends upon the magnitude of R, Land C

Answer: - Option A

Explanation: - Current=Voltage/impedance but for resonance only resistance is considered not impedance

19. When a sinusoidal voltage is applied across R-L series circuit having R = XL, the phase angle will be

(A) Lag by 45º

(B) Lag by 90º

(C) Lead by 0 to 90º

(D) Lead by 90º

Answer: - Option C

20. What do you know about RL circuit?

(A) An electric circuit composed of resistors and inductors in series and driven by a voltage or current source

(B) Conductor

(C) an device composed of resistors and inductors driven by a voltage or current source

(D) None of the above

Answer: - Option A

21. To avoid wastage of power during calibration in dynamometer type wattmeter

a. Phantom loading is used

b. Brake magnet is used.

c. Spring is used.

d. Capacitance is used

Answer: - Option A

22. In a dynamometer type meter, the error due to connections would be minimum if

a. Capacitive reactance of pressure coil is greater than its inductive reactance

b. Capacitive reactance of pressure coil is equal to its inductive reactance

c. Capacitive reactance of pressure coil is lesser than its inductive reactance

d. Capacitive reactance of current coil is equal to its inductive reactance

Answer: - Option B

23. In wattmeter's, errors due to stray fields can be removed by

a. Proper instrument construction

b. Using brake magnet

c. Using shading ring

d. using two separate ac magnets.

Answer: - Option A

24. In some wattmeter's, a small capacitor is connected in parallel with the series resistor for

a. Reducing error due to inductance of the series resistor

b. Obtaining non inductive voltage coil current

c. Making resultant reactance capacitive

d. All of these

Answer: - Option D

25. What will happen if the current coil and potential coil of dynamometer type wattmeter is interchanged?

a. Potential coil will get damaged

b. Current coil will get damaged

c. Both current coil and potential coil will get damaged

d. Neither potential coil nor current coil will get damaged

Answer: - Option B

26. Due to the inductance in the pressure coil of dynamometer type wattmeter, the reading will be

a. High for both leading and lagging power factors

b. Low for both leading and lagging power factors

c. High for lagging power factor and low for leading power factor

d. Low for lagging power factor and high for leading power factor

Answer: - Option C

27. The dynamometer wattmeter's are

a. More accurate on dc supply

b. More accurate on ac supply

c. Equally accurate on both ac and dc supply

d. None of these

Answer: - Option C

28. Unit of inductive or capacitive Reactance is.....

(A) Ohm

(B) Hertz

(C) Siemens

(D) Second

Answer: - Option A

29. Unit of Impedance is.....

(A) Ohm

(B) Hertz

(C) Siemens

(D) Second

Answer: - Option A

30. In standard wattmeter's, the error caused by the voltage coil is overcome by

a. Connecting a high inductive resistance in series to the voltage coil

b. Connecting a high inductive resistance in parallel to the voltage coil

c. Connecting a compensating winding in series to the voltage coil

d. Connecting a compensating winding in parallel to the voltage coil

Answer: - Option C

31. In case of dc supply and in case of ac supply, the torque produced is

a. Directly proportional to power, inversely power to power

b. Directly proportional to power, directly proportional to power

c. Inversely proportional to power, inversely proportional to power

d. Inversely proportional to power, directly proportional to power

Answer: - Option B

32. A Merz price demand indicator indicates

A. Average maximum demand over a specified period of time

B. Maximum demand

C. Maximum energy consumption

Answer: - Option A

33. Reactance means.....

(A) Opposition to current by inductor

(B) Opposition to current by capacitor

(C) Both A & B

(D) none of these

Answer: - Option C

34. Synchronization of A.C. supply means _____

a) different phase sequence

b) same phase sequence

c) zero phase

d) using a transformer

Answer: - Option B

35. Disc rotation is determined by _____

a) the supply voltage

b) an arrow

c) the turns ratio

d) the load current

Answer: - Option B

36. A rotating phase sequence indicator consists of _____

a) 1 coil

b) 2 coils

c) 5 coils

d) 3 coils

Answer: - Option D

37. Phase sequence indicator gives the maximum value of phase voltages.

a) True

b) False

Answer: - True

38. Eddy e.m.f produces a torque.

a) True

b) False

Answer: - True

Measurement of electric energy

Content of Chapter:-

4.1 Single and three phase electronic energy meter: Constructional features and working principle.

4.2 Errors and their compensations.

4.3 Calibration of single phase electronic energy meter using direct loading.

1. The meter constant of single phase energy meter is expressed in terms of

A. Revolutions/kWh

B. kW/kWh

C. Amps/kW

D. Volts/kWh

Answer: - Option A

2. If voltage supply to the energy meter is more than the rated value, energy meter will run

A. Slow

B. Fast

C .Either of the above

D.None of the above

Answer: - Option A

3.Aluminium is selected as the material for rotating disc of energy meter because

A.It is good conductor

B. It is light

C. It is indigenously available

D. All of the above reasons

Answer: - Option D

4. Which of the following meters are not used on D.C. circuits

A. Mercury motor meters

B. Commutator motor meters

C. Induction meters

D. None of the above

Answer: - Option C

An A.C. voltage is impressed across a pure resistance of 3.5 ohms in parallel with a pure inductance of impedance of 3.5 ohms,

(A) The current through the resistance is more

(B) The current through the resistance is less

(C) Both resistance and inductance carry equal currents

(D) None of the above

Answer: - Option C

5. Power factor for R-L Parallel circuit is

(A) Leading
(B) unity
(C) Lagging
(D) None of above

Answer: - Option C

6. Power factor of electric bulb is
(A) Zero
(B) Lagging
(C) Leading
(D) Unity

Answer: - Option D

8 1. Magnitude of flux in an energy meter varies _____
a) due to abnormal currents and voltages
b) due to high resistance and inductance values
c) due to changes in the transformer turns
d) due to the induced e.m.f in the windings
Answer: - Answer: a

Explanation: In the driving system of an energy meter, magnitude of flux can be incorrect as a result of abnormal values of currents and voltages. This occurs due to a change in the resistance of the pressure coil circuit.

9 Phase angles in an energy meter cannot be incorrect.
a) True
b) False

Answer: -Option b
Explanation: In an energy meter, phase angle errors occur as a result of improper adjustments of lag condition, abnormal frequencies etc. Due to temperature, changes in resistance values also lead to error in the phase angle.
10. In some energy meters, creeping can be avoided by _____
a) Attaching small gold pieces
b) attaching small aluminum pieces
c) attaching small iron pieces
d) attaching small zinc pieces
Answer: - c
Explanation: By attaching some iron pieces to the edge of the disc, creeping can be limited in some energy meters. Force of attraction that is experienced by the brake magnet as a result of the iron piece is enough to eliminate the creeping.

11. In parallel circuit power loss is due to…….
(A) Conductance alone
(B) Susceptance alone

(C) Both A& B
(D) none of above
Answer: - Option A

12. Domestic appliances connected in parallel because
(A) Acquire less space
(B) Voltage across each will be rated
(C) Operation of each become independent
(D) B & C
Answer: - Option D

13. Measurement of energy involves _____
a) Inductance and capacitance measurement.
b) Power consumption and time duration.
c) Resistance measurement and voltage drop.
d) Current consumption and voltage drop.
Answer: - Option B

14. Frequency of oscillation in an electronic energy meter depends on _____
a) output current of multiplier
b) output voltage of multiplier
c) output power of multiplier
d) input resistance of multiplier
Answer: - option a.
Explanation: Oscillator used in an energy meter generates a square wave. The frequency of the this depends on the output current flowing through the multiplier.

15. Analog signal is converted _____
a) Into oscillations
b) into digital
c) into pulses
d) into current
Answer: - Option b
Explanation: The analog signal obtained in an electronic energy meter is converted into digital by making use of a digital circuit. By making use of a seven-segment display, energy is mentioned in watt-hours.

16. An electronic energy meter is advantageous compared to conventional ones.
a) True
b) False
Answer: - Option a
Explanation: An electronic energy meter does not have frictional losses, creeping is not needed irrespective of the nature of the load such as low load, full load power factor, etc and the accuracy in the reading is of the order of ±1%.

17. Energy meter can be directly used in measurement.

a) True
b) False
Answer: - Option b
Explanation: Adjustments need to be made in an energy meter before it is used for the measurement of energy. This is done in order to keep the errors due to measurement within allowable limits of ±5 %.

18. Preliminary light load adjustment involves _____
a) applying rated voltage across current coil
b) making use of a light load
c) applying rated voltage across pressure coil
d) adjusting the light load
Answer: - Option c
Explanation: Rated voltage is applied across the pressure coil. No current flows through the current coil. Till the disc stops rotating, light load device or equipment is adjusted continuously.

19. Low power factor adjustment involves _____
a) adjusting the power factor at lower loads
b) applying rated voltage to pressure coil and a p.f. of 0.5 for current coil
c) only applying rated voltage to pressure coil
d) only a p.f. of 0.5 for the current coil
Answer: - Option b
Explanation: Rated voltage is applied to the pressure coil. The current coil is provided with a current at 0.5 p.f. lagging. Till the disc rotates at correct speed, lag device is adjusted.

20. Full load u.p.f adjustment involves _____
a) adjusting the loads at unity power factor
b) applying rated voltage to pressure coil and a p.f. of unity for current coil
c) only applying rated voltage to pressure coil
d) only a p.f. of unity for the current coil
Answer: - Option C
Explanation: Rated voltage is applied to the pressure coil. The current coil is provided with a current at unity p.f. Errors are kept minimum and the position of the brake magnet is so adjusted that disc rotates at the correct speed.

21. What is the expression for the current in the inductor from the following circuit?
a) V/I
b) V/XL
c) 0
d) cannot be determined
Answer: B
Explanation: In the given circuit, the voltage across the inductor is the same as the source voltage as they are connected in parallel. The current in the inductor is IL hence IL=V/XL.

22. What is the phase relation between IL and V from the following circuit?
a) IL lags V
b) IL leads V

c) IL and V are in phase

d) No relation

Answer: A

Explanation: IL is the current across the inductor and we know that the current across the inductor always lags the voltage across it. Hence IL lags V.

23. The active component in an impedance parallel circuit will_____the voltage.

a) Leads

b) Lags

c) Be in phase with

d) Either leads or lags

Answer: C

Explanation: The active component in an impedance parallel network will always be in phase with the voltage in the circuit.

24. The phase difference between the active component of an impedance parallel circuit and the voltage in the network is _____

a) 0

b) 90

c) 180

d) 360

Answer: A

Explanation: The active component in an impedance parallel network will always be in phase with the voltage in the circuit. Hence the phase difference is 0.

25. The quadrature component is also known as?

a) Active component

b) Reactive component

c) Either active or reactive component

d) Neither active nor reactive component

Answer: B

Explanation: The quadrature component is also known as the reactive component because the reactive component forms a quadrature with the voltage.

26. Find the expression for the current I from the given circuit.

a) I=IL

b) I=IR

c) I=IL+IR

d) I=0

Answer: C

Explanation: I is the total current in the circuit. Since this is a parallel connection, the total current in the circuit is equal to the sum of the currents in each branch of the circuit. Hence I=IR+IL.

27..... meter has the best accuracy

A. Thermocouple

B. Moving-coil

C .Moving-iron

E. Rectifier type

Answer: B

28. An electronic energy meter makes use of.....

A) IC

B) transformer

C) CRO

D) multimeterAnswer:

Option A

29. Phase sequence indicator gives the maximum value of phase voltages.

a) True

b) False

Answer: a

Explanation: The phase sequence for a three phase supply indicates the order in which maximum values of phase voltages ER, EY, and EB occur. A three phase supply can be in either RYB or RBY configuration.

30. Synchronization of A.C. supply means _____

a) different phase sequence

b) same phase sequence

c) zero phase

d) using a transformer

Answer: b

Explanation: During synchronization, the phase sequences of any two given supplies are maintainedequal. This is ensured by making use of a phase sequence indicator.

31. How many types of phase sequence indicators are there?
a) 1
b) 5
c) 2
d) 10
Answer: c
Explanation: Generally, two types of phase sequence indicators are used. The first one is the rotating type while the second type is the static type. Usually the rotating type of phase sequence indicator is used.

32. A rotating phase sequence indicator consists of _____
a) 1 coil
b) 2 coils
c) 5 coils
d) 3 coils
Answer: d
Explanation: A rotating type of phase sequence indicator basically consists of three coils. These are mounted at 120º to each other is space. The ends of the coils are connected to the terminals R, Y, and B respectively.

33. The three coils are _____
a) star connected
b) delta connected
c) not connected
d) shorted
Answer: a
Explanation: In a rotating type phase sequence indicator, the three coils are connected in the form of a star and excited by a three-phase supply.

34. Excitation of the three coils produces _____
a) a static magnetic field
b) a rotating magnetic field
c) a static electric field
d) a rotating electric field
Answer: b
Explanation: Aluminum disc is mounted on the top of the three coils. A rotating magnetic field is produced when the three coils are excited by a supply of three phase. As a result e.m.f with eddy currentefects are induced in the coils.

35. Eddy e.m.f produces a torque.
a) True
b) False
Answer: a

Explanation: A rotating magnetic field is produced when the three coils are excited by a supply of three phase. As a result, eddy e.m.f circulates in the disc. A torque is produced as a result of the interaction between the eddy currents and the rotating magnetic field.

36. Disc rotation is determined by _____

a) the supply voltage

b) an arrow

c) the turns ratio.

d) the load current.

Answer: b

Explanation: Direction of rotation of the disc is determined by making use of an arrow that is marked on the disc. The phase sequence of the supply voltage is same as that mentioned on the terminals of themeter provided disc rotates in the same direction as the arrow head

Measuring Instrument

Content of Chapter:-

5.1 Measurement of resistance, Megger and Earth tester, Multimeter and LCR meter.

5.2 Frequency meter.

5.3 Phase Sequence and Phase sequence indicator.

5.4 Synchro scope and infrared meter.

5.5 Single beam/single trace CRO, Digital storage oscilloscope: Basic Block Diagram, working Cathode ray tube, electrostatic deflection, vertical amplifier, time base generator.

5.6 Signal generator: need, working and basic block diagram.

5.7 Function generator: need, working and basic block diagram, function of symmetry.

5.8 Tri vector meter.

1. Bridge circuits are used for the measurement of

A. Resistance

B. Inductance

C. Capacitance

D. All of these

Answer: - Option D

2. Which of following is advantage on 3 Phase AC over 1 Phase AC System?

(A) More output power

(B) Less space required to produce same power

(C) Self-starting of machine is possible

(D) All of them

Answer: - Option D

3. Phase Sequence is a sequence in which 3 phase voltages reach their..... Values

(A) Minimum positive

(B) Maximum Positive

(C) Minimum Negative

(D) Maximum Negative

Answer: - Option B

4. What happens if Phase sequence is changed?

(A) Motor takes large current

(B) Motor rotation direction changes

(C) Motor Stops

(D) Motor continue rotation in same direction

Answer: - Option B

5. Identify the correct phase sequence?

(A) B-C-A

(B) A-B-C

(C) C-A-B

(D) None of above

Answer: - Option B

Explanation: - Phase Sequence is a sequence in which 3 phase voltages reach their maximum positive values

6. Identify the type of three phase connection?

(A) Three Phase Three Wire Star Connected System

(B) Three Phase Four Wire Star Connected System

(C) Three Phase Three Wire Delta Connected System

(D) None of above

Answer: - Option A

7. Identify the type of three phase connection?

(A) Three Phase Three Wire Star Connected System

(B) Three Phase Four Wire Star Connected System

(C) Three Phase Three Wire Delta Connected System

(D) None of above

Answer: - Option B

8. Identify the type of three phase connection?

(A) Three Phase Three Wire Star Connected System

(B) Three Phase Four Wire Star Connected System

(C) Three Phase Three Wire Delta Connected System

(D) None of above

Answer: - Option C

9. Voltage across any phase is..... and voltage across any two lines is.....

(A) Line Voltage, Phase voltage

(B) Phase Voltage, Line voltage

(C) 3 Phase Voltage

(D) None of above

Answer: - Option B

10. Identify type of load

(A) Unbalanced Star Load

(B) Unbalanced Delta Load

(C) Balanced Star Load

(D) Balanced Delta Load

Answer: - Option A

Explanation: - All impedances are not equal

11. Identify type of load

(A) Unbalanced Star Load

(B) Unbalanced Delta Load

(C) Balanced Star Load

(D) Balanced Delta Load

Answer: - Option C

Explanation: - All impedances are equal

12. In balanced star or Delta connected load all phase and line values of current & voltage will be.....

(A) Unequal

(B) Depends on type of load

(C) Equal

(D) None of above

Answer: - Option C

Explanation: - All impedances are equal so all values will be equal

13. For a star connected three phase AC circuit ——

(A) Phase voltage is equal to line voltage and phase current is root three times the line current

(B) Phase voltage is square root three times line voltage and phase current is equal to line current

(C) Phase voltage is equal to line voltage and line current is equal to phase current

(D) None of the above

Answer: - Option B

14. For a Delta connected three phase AC circuit ——

(A) Phase voltage is equal to line voltage and phase current is three times the line current

(B) Phase voltage is square root three times line voltage and phase current is equal to line current

(C) Phase voltage is equal to line voltage and line current is equal to square root three times phase current

(D) None of the above

Answer: - Option C

15. Active Power in a Three Phase Circuit =_____.

(A) P = 3 VPh IPh CosΦ

(B) P = $\sqrt{3}$ VL IL CosΦ

(C) Both 1 & 2

(D) None of The AboveAnswer: -

Option B

17. Low resistance is the resistance of the order of

A. 1 ohm and less than 1 ohm

B. 1 ohm to 1 mega ohm

C. More than one ohm

D. None of these

ANSWER: A. 1 ohm and less than 1 ohm

18. The example of low resistance is/are

A. Resistance of armature windings of electrical machine

B. Resistance of series field winding of a dc machine

C. Resistances of shunts and lead wires

D. All of these

ANSWER: D. All of these

19. The accuracy in a bridge measurement depends on

A. Sensitivity of detector

B. Applied voltage

C. Accuracy of indicator

D. Both (a) and (b)

ANSWER: D. Both (a) and (b)

20. The high resistances are found in

A. Insulation resistance of cables and wires

B. Resistance of shunt field winding and the multipliers

C. Resistance of armature windings of electrical machine

D. Resistance of series field winding of a dc machine.

ANSWER: A. Insulation resistance of cables and wires

22. A null type of bridge with dc excitation is commonly known as

A. Wheatstone bridge

B. Anderson bridge

C. Wien bridge

D. Schering bridge

ANSWER: A. Wheatstone bridge.

23 In Wheatstone bridge method, the instrument used as null detector is

A. Ammeter

B. Voltmeter

C. Galvanometer

D. All of these

ANSWER: C. Galvanometer

24. In a Wheatstone bridge method, the bridge is said to be balanced, when the current through the galvanometer is

A. 1 A

B. 0 A

C. Maximum

D. Half of the maximum value

ANSWER: B. 0 A

25. The given figure shows the Wheatstone bridge method for measurement of unknown resistance (R).

The balanced equation for Wheatstone bridge is given by

A. P/R = Q/S

B. P/S = Q/R

C. P/R = S/Q

D. R/P = Q/S

ANSWER: A. P/R = Q/S

26. The sensitivity of Wheatstone bridge is defined as ratio of

A. Deflection of the galvanometer to the unit fractional change in the value of unknown resistance.

B. Square of the deflection of the galvanometer to the unit fractional change in the value of unknown resistance.

C. Deflection of the galvanometer to the twice of the unit fractional change in the value of unknown resistance.

D. Unit fractional change in the value of unknown resistance to the deflection of the galvanometer.

ANSWER: option A.

27. To increase the current sensitivity below 10 mV, electronic instrument uses

A. Amplifiers

B. Modulator
C. Transducer
D. Oscillator

ANSWER: A. Amplifiers

28. In a ramp type DVM, the multivibrator determines the rate at which the
A. Clock pulses are generated
B. Measurement cycles are initiated
C. It oscillates
D. Its amplitude varies

ANSWER: B.Measurement cycles are initiated.

29. Q meter is used to measure the properties of
A. Inductive coils
B. Non inductive coils
C. Capacitive coils
D. Both (a) and (c)

ANSWER: D. Both (a) and (c)

30. Depending on whether the display is a numeric or alphanumeric, the segmental displays is
A. 7 segmental
B. 14 segmental
C. 21 segmental
D. Either (a) or (b)

ANSWER: D. Either (a) or (b)

31. In liquid crystal displays, the liquid crystal exhibits properties of
A. Liquid
B. Solids
C. Gases
D. Both (a) and (b).

ANSWER: D. Both (a) and (b).

32. The basic difference between square wave and pulse generator is their
A. Waveforms shape
B. Duty cycles
C. Frequency range
D. Cost

ANSWER: B. Duty cycles