

UNIT- 4 MCQ's

Electronic Instrumentation

MCQ's on DMM:

1. Digital multimeter is used for _____
- a) measuring a.c. and d.c. current, voltage and resistance
 - b) measuring a.c. current and voltage
 - c) measuring d.c. current and resistance
 - d) measuring a.c. voltage and resistance

Answer: a

Explanation: Digital multimeter is usually used for the measurement of a.c. current, voltage and resistance. It is also used for the measurement of d.c. current, voltage and resistance as well over several range.

2. Current is converted to voltage _____
- a) through a voltmeter
 - b) through a resistance
 - c) through an ammeter
 - d) through a galvanometer

Answer: b

Explanation: Current is passed through a low shunt resistance and is converted to voltage.

A.C. quantities are converted to D.C. through various rectifier and filter circuits. Voltmeter and ammeter are used for voltage and current measurement respectively.

3. For resistance measurement, meter contains _____
- a) high current source
 - b) medium current source
 - c) low current source
 - d) low voltage source

Answer: c

Explanation: Usually in the measurement of resistance, meter consists of a precision low current source applied across an unknown resistance which gives a d.c. voltage.

4. In DMM/FG, Quantities are digitised using _____
- a) D/A converter
 - b) oscillator
 - c) amplifier
 - d) A/D converter

Answer: d

Explanation: Quantities such as current, voltage and resistance are digitised by making use of an A/D converter. They are then displayed on the screen by making use of a digital display.

5. Output of a digital multimeter is _____
- a) mechanical
 - b) optical
 - c) electrical
 - d) analog

Answer: c

Explanation: Digital multimeter gives an electrical signal as the output. A/D converter is employed for the conversion from analog to digital signal. This can be used for interfacing with external equipment.

6. Basic building blocks of digital multimeter are _____
- a) oscillator, amplifier
 - b) diode, op amp
 - c) rectifier, schmitt trigger

d) A/D, attenuator, counter

Answer: d

Explanation: Usually dual slope integrating type ADC is preferred in multimeter. It basically consists of several A/D converters, counter circuits and an attenuation circuit.

7. In DMM, Resistance is measured using _____

- a) constant current source
- b) constant voltage source
- c) variable current source
- d) variable voltage source

Answer: a

Explanation: Constant current source is used to measure resistance in a digital multimeter. Standard known value of current is passed through an unknown resistance and the drop in voltage across the resistance is measured.

8. In DMM A.C. voltages are measured using _____

- a) oscillators and op amps
- b) rectifiers and filters
- c) resistor and capacitor
- d) inductor and resistor

Answer: b

Explanation: Rectifiers and filter circuits with various configurations are employed for measuring A.C. voltages. A.C. is converted to D.C. and is applied to the A/D converter.

9. The name of the instrument itself suggest that ais used to measure more than one quantity.

- a. CRO
- b. DSO
- c. DMM
- d. Power Scope

ANSWER: c.

10. The DMMs have almost entirely replaced the.....due to many reasons.

- a. CRO
- b. DSO
- c. Analog multimeter
- d. Function Generator

ANSWER: c.

11. In the DMM.....is basically a resistive potential divider with multiple resistors connected in series between the input and ground point.

- a. DC voltage attenuator
- b. Rectifier
- c. Current to voltage convertor (I to V)
- d. Resistance to voltage convertor (R to V)
- e. A to D

ANSWER: a.

12. In the DMM.....block gives digital output.

- a. Counter
- b. Display
- c. Current to voltage convertor (I to V)
- d. Resistance to voltage convertor (R to V)
- e. ADC

ANSWER: e.

13. Which is advantage of DMM over conventional analog multimeter?

- a. high input impedance
- b. high accuracy
- c. automatic range selection
- d. auto-zeroing
- e. all of the above

ANSWER: e.

MCQ's on Function Generator:

1. Function generator cannot produce ramp output?

- a. True
- b. False

ANSWER: b.

2. What type of comparator is used in function generator to give square wave output?

- a. Inverting comparator
- b. Non-inverting comparator
- c. ZCD comparator
- d. Positive feedback comparator (Schmitt trigger)

ANSWER: d.

3. Which block in function generator converts triangular wave to sine wave?

- a. Integrator
- b. comparator
- c. constant current source
- d. diode-wave shaping circuit

ANSWER: d.

4. Which block in function generator converts triangular wave to sine wave?

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- d. diode-wave shaping circuit

ANSWER: d.

5. 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

6. In function generator, the output waveform of integrator is

- A. Sinusoidal
- B. Square
- C. Triangular
- D. Saw-tooth

ANSWER: C. Triangular

MCQ's on Digital Storage Oscilloscope

1. What is S/H block in DSO called?

- a. Slow and High
- b. Sample and High
- c. Slow and Hold
- d. Sample and Hold

ANSWER: d.

2. What is the main advantage of using a digital storage oscilloscope?

- a) uses digital storage
- b) uses analog storage
- c) uses mixed mode storage
- d) uses disc storage

Answer: a

Explanation: The disadvantage of an analog storage oscilloscope is overcome in a digital storage oscilloscope. The unreliable storage method in an analog storage oscilloscope is overcome in a digital storage oscilloscope. The digital storage oscilloscope makes use of digital storage for the memory.

3 The memory of a digital storage oscilloscope is limited.

- a) True
- b) False

Answer: b

Explanation: In a digital storage oscilloscope, the memory can store data as long as required without degradation. It makes use of complex signal processing techniques through high speed digital signal processing.

4 In DSO The waveform is stored in _____

- a) compressed form
- b) analog form
- c) digital form
- d) mixed form

Answer: c

Explanation: The waveform to be studied is stored in digital form in the digital storage oscilloscope. It is digitized and stored in a digital memory.

5. Which oscilloscope is used in a digital storage oscilloscope?

- a) multi trace
- b) dual trace
- c) modern
- d) conventional

Answer: d

Explanation: A digital storage oscilloscope makes use of a conventional cathode ray tube. As a result, the cost is reduced.

6. Power requirement is _____

- a) low
- b) high
- c) medium
- d) zero

Answer: a

Explanation: In a digital storage oscilloscope, the power required by the memory is less. It can be supplied through the means of a small battery.

7. The stored image can be displayed _____

- a) for a limited time
- b) for infinite time
- c) for zero time
- d) for an intermediate time

Answer: b

Explanation: In a digital storage oscilloscope, the stored image can be displayed for a long time as long as the power supply to the digital memory is kept intact without any kind of disruption.

8. The analog signal is digitized using _____

- a) D/A converter
- b) Oscillator
- c) A/D converter
- d) Rectifier

Answer: c

Explanation: In a digital storage oscilloscope, the analog signal is digitized by making use of an analog to digital converter. After digitizing the waveform is loaded into a computer and can be analyzed.

9. How is the data displayed?

- a) through a screen
- b) through a computer
- c) through an FPGA
- d) through a microprocessor

Answer: d

Explanation: In a digital storage oscilloscope, the data is displayed by passing it through a microprocessor which processes the data and displays the waveform onto a screen.

10. A digital storage oscilloscope has _____

- a) 3 modes
- b) 2 modes
- c) 4 modes
- d) 5 modes

Answer: a

Explanation: In a digital storage oscilloscope, there are three modes of operation. They are as follows:

- Store
- Roll
- Hold or Save.

MCQ's on AC to DC Power Supply:

1. In power supply following IC is called as voltage regulator...

- a. 78XX
- b. 79XX
- c. 7812
- d. 7815
- e. All above

ANSWER: e.

2. Which of the following can be a source of supply in dc power supplies?

- a) Battery
- b) Dry cell
- c) Full wave rectifier
- d) All of the mentioned

View Answer

Answer: d

Explanation: Source of supply will be a battery, dry cell or full wave rectifier etc.

3. Which of the application's filters used for?

- a) Reducing ripples
- b) Increasing ripples
- c) Increasing phase change
- d) Increasing amplitude

View Answer

Answer: a

Explanation: Ripples are ac components and filters are used for eliminating ac components from a signal.

4. Which of the following represent a change of output voltage when load current is increased?

- a) Line regulation
- b) Load regulation
- c) Current regulation
- d) Voltage regulation

View Answer

Answer: b

Explanation: Load regulation is the process of fractional change of output voltage when load current is increased from zero to maximum value.

5. Why zener diodes are provided in dc supply?

- a) For forward conduction
- b) For reverse conduction
- c) For reference voltage
- d) For increasing amplitude

View Answer

Answer: c

Explanation: Zener diodes in dc power supplies are used for providing a reference voltage used for comparison.

6. In power supply Stability of output voltage is entirely depended on _____

- a) Stability of transformer
- b) Stability of zener diode
- c) Quality of wires
- d) Capacitor values

View Answer

Answer: b

Explanation: Stability of zener diodes used is an important factor in determining the stability of output voltage in dc power supply.

7. In power supply (inside voltage regulator) Which of the following can be used as a comparator?

- a) Zener diode
- b) Diode
- c) Operational amplifier
- d) All of the mentioned

View Answer

Answer: c

Explanation: Operational amplifier can be used as a comparator circuit.

8. Which of the following are not the standard value of Zener diodes?

- a) 5.1 V
- b) 5.6 V

- c) 5.8V
 - d) 6.2V
- View Answer

Answer: c

Explanation: Standard values of zener voltages are 5.1V, 5.6V, 6.2V and 9.1V etc.

9. In an unregulated power supply, if input a.c. voltage increases, the output voltage

- 1. Increases
- 2. Decreases
- 3. Remains the same
- 4. None of the above

Answer : 1

10. A power supply which has voltage regulation of is unregulated power supply

- 1. 0 %
- 2. 5 %
- 3. 10 %
- 4. 8%

Answer : 3

11. Commercial power supplies have voltage regulation

- 1. of 10%
- 2. of 15%
- 3. of 25%
- 4. within 1%

Answer : 4

12. An ideal regulated power supply is one which has voltage regulation of

- 1. 0%
- 2. 5%
- 3. 10%
- 4. 1%

Answer : 1

13. A Zener diode utilises characteristic for voltage regulation

- 1. Forward
- 2. Reverse
- 3. Both forward and reverse
- 4. None of the above

Answer : 2

14. Zener diode can be used as

- 1. dc. voltage regulator only
- 2. ac. voltage regulator only
- 3. both d.c. and a.c. voltage regulator
- 4. none of the above

Answer : 3

15. A Zener diode is used as a voltage regulating device

1. Shunt
2. Series
3. Series-shunt
4. None of the above

Answer : 1

MCQ's on Autotransformer

1. Following is application of autotransformer..

- a. Variac
- b. Induction motors or synchronous motors
- c. Furnace
- d. Dimmerstat
- e. All above

ANSWER: e.

2. Which of the following is the main advantage of an auto-transformer over a two-winding transformer?

- a) Hysteresis losses are reduced
- b) Saving in winding material
- c) Copper losses are negligible
- d) Eddy losses are totally eliminated

View Answer

Answer: b

Explanation: Auto transformer is a special type of transformer which has primary and secondary winding both located on same winding. Thus, winding material required for a transformer is very less in the case of autotransformer.

3. Auto-transformer makes effective saving on copper and copper losses, when its transformation ratio is...

- a) Approximately equal to one
- b) Less than one
- c) Great than one
- d) Cannot be found

View Answer

Answer: a

Explanation: $\text{Copper In auto transformer} / \text{copper in two-winding transformer} = 1 - T_2/T_1$. This means that an auto transformer requires the use of lesser quantity of copper given by the ratio of turns. Hence, if the transformation ratio is approximately equal to one, then the copper saving is good and the copper loss is less.

4. Total windings present in a autotransformer are _____

- a) 1
- b) 2
- c) 3
- d) 4

View Answer

Answer: a

Explanation: Autotransformer is the special transformer for which the single winding acts as a primary and secondary both. Thus, by taking the appropriate winding into consideration a variable secondary voltage is obtained.

5. Autotransformers are particularly economical when _____

- a) Voltage ratio is less than 2
- b) Voltage ratio is very high
- c) Voltage ratio is higher than 2 in smaller range
- d) Can be used anywhere

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Answer: a

Explanation: Autotransformer is economical where the voltage ratio is less than 2 in which case electrical isolation of the two windings is not essential. The major applications are induction motor starters, interconnection of HV systems at voltage levels with ratio less than 2, and in obtaining variable voltage power supplies (low voltage and current levels).

6. Which of the following is not true regarding the autotransformer compare to two-winding transformer?

- a) Lower reactance
- b) Lower losses
- c) Higher exciting current
- d) Better voltage regulation

[View Answer](#)

Answer: c

Explanation: Autotransformer is the advance version of normal transformer. It is having better voltage regulation, higher efficiency due to lower losses, lower reactance and thus it also requires very small exciting current.

7. Two-winding transformer of a given VA rating if connected as an autotransformer can handle _____

- a) Higher VA
- b) Lower VA
- c) Same VA
- d) Cannot be found

[View Answer](#)

Answer: a

Explanation: A two-winding transformer of a given VA rating when connected as an autotransformer can handle higher VA. This is because in the autotransformer connection part of the VA is transferred conductively.

8. When auto-transformation ratio becomes equal to 1, which of the following statement is true?

- a) VA rating of the autotransformer becomes far greater than VA rating of two winding transformer
- b) VA rating of the autotransformer becomes far lower than VA rating of two winding transformer
- c) VA rating of the autotransformer becomes equal to VA rating of two winding transformer
- d) Can't comment

[View Answer](#)

Answer: a

Explanation: VA rating of autotransformer is $= [1/1-a] * VA$ of two-winding transformer, thus, when a i.e. transformation ratio of autotransformer becomes closer to 1 one gets very high value of VA rating of an autotransformer.

9. An autotransformer compared to its two-winding counterpart has a higher operating efficiency.

- a) True
- b) False

[View Answer](#)

Answer: a

Explanation: The losses are less in autotransformer compare to two-winding transformer. Thus, for the given same input to autotransformer as that of two-winding transformer more output will be available to secondary side.

10. What are the modes in which power can be transferred in an autotransformer?

- a) Conduction
- b) Induction
- c) Conduction and Induction
- d) Cannot be said

View Answer

Answer: c

Explanation: In two winding transformer there is no electrical connection between primary and secondary. So, the power is transferred through induction. But in auto-transformer there is a common electrical path between primary and secondary. So, power is transferred through both conduction and induction processes.

11. For the same excitation voltage and winding currents, the autotransformer gives

- a. Less output than two winding transformer
- b. Equal to the output of two winding transformer
- c. Half of the output of two winding transformer
- d. More than the output of the two winding transformer

ANSWER: d. More than the output of the two winding transformer

12. Whether the given autotransformer is step up or step down, its VA rating is always

- a. Greater than the two winding transformer
- b. Equal to the two winding transformer
- c. lesser than the two winding transformer
- d. cannot say

ANSWER: a. Greater than the two winding transformer

13. Compared to the two winding transformer, in an autotransformer the leakage reactance and copper losses is

- a. less, more
- b. less, less
- c. more, more
- d. more, less

ANSWER: b. less, less

MCQ's on DC Ammeter and Voltmeter:

1. The conventional analog ammeters and voltmeters can be constructed by the following....

- a. PMMC instrument
- b. Moving Iron type (Attraction type)
- c. Moving Iron type (Repulsion type)
- d. All above

ANSWER: d.

2. When PMMC instrument is to be used as an ammeter, an external low resistance called as...

- a. R_m
- b. R_{sh}
- c. R_{se}
- d. R_L

ANSWER: b.

3. When PMMC instrument is to be used as a voltmeter, an external high resistance is called as...

- a. R_m
- b. R_{sh}

- c. Rse
 - d. RL
- ANSWER: c.

4. When PMMC instrument as a ammeter the range can be extended byRsh and the corresponding multiplying factor can be

- a. increasing, increasing
- b. increasing, decreasing
- c. decreasing, decreasing
- d. decreasing, increasing

ANSWER: c.

5. _____ helps in current measurement by placing it in _____ with the circuit element.

- a) Voltmeter, Parallel
- b) Ammeter, series
- c) Voltmeter, series
- d) Ammeter, parallel

View Answer

Answer: b

Explanation: In series, current is same. So Ammeter is placed in series and is used to measure current.

6. An ideal voltmeter has _____ equivalent resistance and ideal ammeter has _____ equivalent resistance.

- a) Unity, Unity
- b) Zero, infinite
- c) Infinite, Zero
- d) Zero, Zero

View Answer

Answer: c

Explanation: An ideal voltmeter has Infinite equivalent resistance and ideal ammeter has zero equivalent resistance.

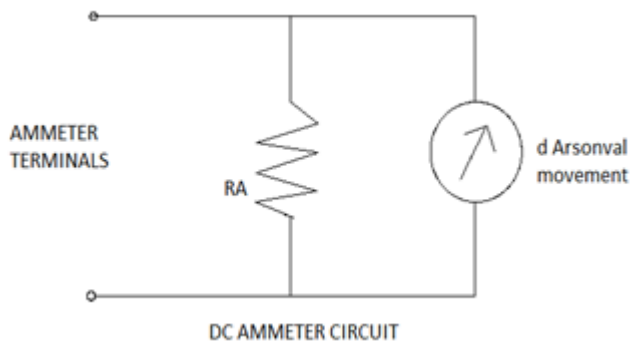
7. A 20mv, 1mA d'Arsonval movement is used in an ammeter whose full-scale reading is 10 mA. Determine R_A .

- a) 2.222Ω
- b) 6.667Ω
- c) 5.92Ω
- d) 3.333Ω

View Answer

Answer: a

Explanation:



1 mA flowing through coil implies that 9mA must be diverted through R_A .

$$V = ir$$

$$20 * 10^{-3} = 9 * 10^{-3} R_A$$

$$R_A = 2.222\Omega.$$

8. A 25mv, 2mA d'Arsonval movement is to be used in voltmeter whose full scale reading is 100v. The resistance inserted by 100v meter into circuit is _____

- a) $1 * 10^5 \Omega$
- b) $1 * 10^6 \Omega$
- c) $1 * 10^4 \Omega$
- d) $1 * 10^3 \Omega$

View Answer

Answer: a

Explanation: $v = iR$

$R = v/i$

$= 100/1\text{mA}$

$= 100,000\Omega.$

9. An ideal voltmeter functions as _____ circuit

- a) A short
- b) An open
- c) A power
- d) An infinite

Answer: b

Explanation: An ideal voltmeter offers an infinite equivalent resistance. So acts as an open circuit.

10. An ideal ammeter functions as _____ circuit

- a) A short
- b) An open
- c) A power
- d) An infinite

Answer: a

Explanation: An ideal ammeter offers a zero equivalent resistance. So acts a short circuit.

11. A 100mv, 5mA d'Arsonval movement is to be used in an ammeter whose full-scale reading is 1A. Calculate R_A .

- a) 0.7 ohms
- b) 0.5 ohms
- c) 0.1 ohms
- d) 0.2 ohms

View Answer

Answer: c

Explanation: 5mA is flowing through the coil which implies 995mA are diverted through R_A .

$V = iR$

$= 100 * 10^{-3}$

$= 995 * 10^{-3} R_A$

$R_A = 0.100\Omega.$

12. A 122mv, 12mA d'Arsonval movement is to be used in voltmeter whose full scale reading is 120v. The resistance inserted by 120v _____

- a) 1200Ω
- b) 12000Ω
- c) 1000Ω
- d) $10,000\Omega$

View Answer

Answer: d

Explanation: $R = 120/12 * 10^{-3}$

$= 10,000\Omega.$

13. The instrument which can be used only with the d.c. supply is

- A. PMMC instrument
- B. Electrodynamometer instrument
- C. Hot-wire instrument
- D. Split phase induction type instrument

ANSWER: A. PMMC instrument

14. The instrument which can be used only with the a.c. supply is/are

- A. Induction type
- B. Electrostatic type
- C. Electrodynamometer type
- D. All of these

ANSWER: A. Induction type

15. A moving coil instrument having a internal resistance of 50 ohm has a full scale deflection of 1mA. Calculate: (Refer text book page no 5-19)

Shunt resistance (R_{sh}) to convert the instrument into an ammeter of 2A range and Net resistance of the meter (R'_m).

- A. $R_{sh}=0.020$ ohm and $R'_m=0.02598$ ohm
- B. $R_{sh}=0.025$ ohm and $R'_m=0.02498$ ohm.
- C. $R_{sh}=0.023$ ohm and $R'_m=0.02398$ ohm
- D. $R_{sh}=0.020$ ohm and $R'_m=0.02298$ ohm

Ans: B

16. A moving coil instrument having internal resistance of 50 ohm indicates full scale deflection with a current of 10mA. How can it be made to work as: Voltmeter to read 100Volts and Ammeter to read 1A on full scale?

(Refer text book page no 5-19)

- A. $R_{se}=9940$ ohm and $R_{sh}=0.505$ ohm.
- B. $R_{se}=9950$ ohm and $R_{sh}=0.505$ ohm.
- C. $R_{se}=9850$ ohm and $R_{sh}=0.405$ ohm.
- D. $R_{se}=9590$ ohm and $R_{sh}=0.505$ ohm.

Ans: B

17. To convert a 2 mA meter with internal resistance of 120 ohm into an ammeter of range 0 – 200 mA, the value of shunt resistance required is

- A. 1.121 ohm
- B. 1.212 ohm
- C. 1.312 ohm
- D. 1.414 ohm

ANSWER: B. 1.212 ohm

18. In a permanent magnet moving coil instrument, the deflecting torque is

- A. Directly proportional to both number of turns and flux density
- B. Directly proportional to the number of turns and inversely proportional to the flux density
- C. Inversely proportional to the number of turns and directly proportional to the flux density
- D. Inversely proportional to both number of turns and flux density

ANSWER: A. Directly proportional to both number of turns and flux density

19. The scale of PMMC type instruments is

- A. Uniform
- B. Non-uniform
- C. Cramped at the lower ends
- D. Crowded in the middle

ANSWER: A. Uniform

20. A PMMC instrument can be used as ammeter and as voltmeter with the help of

- A. A low resistance shunt, a low series resistance
- B. A low resistance shunt, a high series resistance
- C. A high series resistance, a low resistance shunt
- D. A low series resistance, a high shunt resistance

ANSWER: B. A low resistance shunt, a high series resistance

21. The multiplying factor of a PMMC used as ammeter is

- A. Directly proportional to the shunt resistance
- B. Inversely proportional to the shunt resistance
- C. Inversely proportional to the series resistance
- D. Directly proportional to the series resistance

ANSWER: B. Inversely proportional to the shunt resistance

22. The voltage multiplication factor of a PMMC instrument is

- A. Directly proportional to the required series resistance
- B. Directly proportional to the shunt resistance
- C. Inversely proportional to the shunt resistance
- D. Inversely proportional to the required series resistance

ANSWER: A. Directly proportional to the required series resistance

23. The current sensitive instruments are

- A. PMMC
- B. Hot wire instruments
- C. Electrostatic instruments
- D. Both (a) and (b)

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

End of MCQ Bank