BYJU'S Exam Prep

UPSSSC JE

Electrical Engineering

Mini Mock 1

(January 25th - January 26th 2022)

Questions & Solutions

1.   No. of 2: 1 multiplexer required to design a 32: 1 multiplexer

    A. 31   B. 16

    C. 8   D. 9

Ans.   A

Sol.   For calculation of number of multiplexers

$$\Rightarrow \frac{32}{2} = 16 \qquad \rightarrow Ist stage$$

$$\Rightarrow \frac{16}{2} = 8 \qquad \rightarrow 2nd stage$$

$$\Rightarrow \frac{8}{2} = 4 \qquad \rightarrow 3rd stage$$

$$\Rightarrow \frac{4}{2} = 2 \qquad \rightarrow 4th stage$$

$$\Rightarrow \frac{2}{2} = 1 \qquad \rightarrow 5th stage$$

Total multiplexer required = 16 + 8 + 4 + 2 + 1 = 31

2.   Absorbed moisture contents affect the dielectric strength _____.

    A. directly   B. indirectly

    C. does not effect   D. none of these

Ans.   B

Sol.   Absorbed moisture contents affects the dielectric strength indirectly.

3.   Power factor is highest in case of

    A. Mercury arc lamp   B. Sodium vapour lamps

    C. Tube lights   D. GLS lamps

Ans.   D

Sol.   GLS lamps have the highest power factor.

4.   Difference and Borrow for 3 input subtractor are, if input to subtractor is 101

    A. 1, 1   B. 0, 1

    C. 1, 0   D. 0, 0

Ans.   D

Sol.   For 3 input subtractor,

Difference (D) = A⊕B⊕C

& Borrow (B) = $\overline{A}B + BC + C\overline{A}$

For input 101,

D = 1⊕0⊕1 = 0

B = 0.1 + 0.1 + 1.0 = 0

5.   If the span of coil of a winding in generator is 120°. Then it eliminates:

A. 3rd harmonics   B. 5th harmonics

C. Both   D. None

Ans.   A

Sol.   Chording angle = 180 – 120 = 60°

For 3rd harmonics, $K_{d_3} = \cos\dfrac{n\alpha}{2} = \cos\dfrac{3 \times 60}{2} = 0$

For 5the harmonics, $K_{d_5} = \cos\dfrac{n\alpha}{2} = \cos\dfrac{5 \times 60}{2} \neq 0$

Hence, it eliminates 3rd harmonics.

6.   If y = 0, z = 0 In the logic equation

$$[x + z(y + z + \overline{x})][\overline{y} + \overline{x}(z + \overline{y})] = 0$$

A. x = 0   B. x = 1

C. x = z   D. x = z$^-$

Ans.   A

Sol.   Given y = 0, z = 0

$$[x + z(y + z + \overline{x})][\overline{y} + \overline{x}(z + \overline{y})] = 0$$

$$[x + 0(y + z + \overline{x})][1 + \overline{x}(0 + 1)] = 0$$

$$x[1 + \overline{x}] = 0$$

$$x = 0$$

7.   With the decrease in supply frequency the capacitive reactance of the circuit will

A. Decrease   B. Increase

C. Remains the same   D. Unpredictable

Ans.   B

Sol.

$$X_C = \frac{1}{2\pi f C}$$

Therefore, as f decreases the capacitive reactance (X_C. increases.

8.   The difference between the stator synchronous speed and rotor speeds id called

A. leading speed   B. lagging speed

C. slip speed   D. slow speed

Ans.   C

Sol.   The difference between the stator synchronous speed and rotor speed is called slip speed.

$$N_s - N_r = sN_s = Slip\,speed$$

9.   What is the factor of safety used for current rating in a power installation?

A. 1   B. 1.5

C. 1.75   D. 2

Ans. D

Sol. The safety factor used for the current rating in a power installation is 2.

10. If the capacitor of a single phase motor is short circuited, the motor will _____.

A. start

B. not start

C. start with jerks

D. start and then stop

Ans. B

Sol. If capacitor of single phase induction motor is short circuited then

$X_c = 0$

So there will be no phase difference between main and auxiliary winding currents and motor starting torque will be zero. That's why motor will not run.

11. The magnitude of AT required to establish a given value of flux in the air gap will be much greater than that required for Iron part of a magnetic circuit, because:

A. air is a good conductor of magnetic flux

B. air has the lowest relative permeability

C. iron has the lowest permeability

D. air is a gas

Ans. B

Sol. An air gap is a practically unavoidable part of any magnetic circuit in which there is a relative movement between different parts (e.g. in motors, generators, relays, etc). Due to increased reluctance of an air gap the flux spreads into the surrounding medium causing the flux fringing effect. It is generally an unwanted phenomenon which usually increases proximity and eddy current loss in conductors located in the vicinity of the air gap.

12. Which of the following is NOT the objective of SCADA?

A. Data Communication

B. Monitoring

C. Controlling

D. Planning

Ans. D

Sol. Objectives of SCADA:

1. Monitor: SCADA systems continuously monitor the physical parameters

2. Measure: It measures the parameter for processing

3. Data Acquisition: It acquires data from RTUs (Remote Terminal Units), data loggers, etc

4. Data Communication: It helps to communicate and transmit a large amount of data between MTU and RTU units

5. Controlling: Online real-time monitoring and controlling of the process

6. Automation: It helps for automatic transmission and functionality

13. Which of the following statement is TRUE?

A. A galvanometer can be converted into voltmeter by connecting a low value of resistance in parallel with the galvanometer.

B. A galvanometer can be converted into voltmeter by connecting a high value of resistance in parallel with the galvanometer.

C. A galvanometer can be converted into voltmeter by connecting a low value of resistance in series with the galvanometer.

D. A galvanometer can be converted into voltmeter by connecting a high value of resistance in series with the galvanometer.

Ans.   D

Sol.   A galvanometer can be converted into voltmeter by connecting a high value of resistance in series with the galvanometer.

14.   A linear circuit is one whose parameters:

A. change with change in current

B. change with change in voltage

C. None of the options

D. do not change with voltage and current

Ans.   C

Sol.   A linear circuit is an electric circuit whose parameters are varied with respect to Current and Voltage. In other words, an electric circuit in which circuit parameters (Resistance, inductance, capacitance, waveform, frequency etc) is not constant, is called Non Linear Circuit.

15.   When a source is delivering maximum power to the load, the efficiency will be?

A. 50 %   B. above 50%

C. below 50%   D. maximum

Ans.   A

Sol.   When source is delivering maximum power to load then its efficiency is reduced to 50%.

16.   Consider the following statements for Norton's theorem :

1) Short the branch resistance through which current is to be calculated.

2) Obtain the current through this short-circuited branch, using any of the network simplification techniques.

3) Develop Norton's equivalent circuit by connecting current source I_N with the resistance R_N in series with it

Which of the above statements are correct?

A. 1, 2 and 3   B. 1 and 3 only

C. 1 and 2 only   D. 2 and 3 only

Ans.   C

Sol.   Third statement is wrong as the Norton's equivalent circuit is completed by connecting current source I_N in parallel to R_N.

Steps to develop Norton's equivalent circuit.

1. Short the branch resistance through which current is calculated.

2. Obtain the current through short circuited branch.

3. Find the equivalent resistance across the branch.

4. Connect the current source I_N in parallel to resistance R_N.

17. De Sauty's Bridge is most suitable for the measurement of _____.

    A. resistance   B. inductance

    C. capacitance   D. frequency

Ans. C

Sol. De sauty's is best suitable for Capacitance measurement.

18. The aiding ampere turns of the series field automatically

    A. increase with load   B. decrease with load

    C. equals to the load   D. none of these

Ans. A

Sol. The aiding ampere turns of the series field automatically increase with load.

19. A 220 V d.c. shunt motor takes a total current of $80\ A$ and runs at 800 r.p.m. Resistance of shunt field is $50\ \Omega$ and that of armature $0.1\ \Omega.$ What is the driving power of the motor?

    A. $16050\ W$ B. $14500\ W$

    C. $12600\ W$ D. $18500\ W$

Ans. A

Sol.

$$I_{sh} = 220/50 = 4.4\ A\ ;$$

$$I_a = 80 - 4.4 = 75.6\ A$$
$$E_b = V - I_a R_a = 220 - 75.6 \times 0.1$$
$$\quad\quad = 212.44\ V$$

∴ Driving power $= E_b$

$$I_a = 212.44 \times 75.6 \simeq 16050\ W$$

20. Arc can be produced by?

    A. AC current only   B. DC current only

    C. Either AC or DC current   D. all options are correct

Ans. C

Sol. Arc is used in Arc welding for combining of two metals.

    Are welders can use either DC (or) AC current, & consumable (or) non-consumable electrodes. Welding is the process of joining of metal to metal by using electricity to create enough heat to melt metal, and the melted metals when cools result in binding of the metal.

21. Creeping in a single phase induction type energy meter may be due to?

    A. All of the given options

    B. Over compensation for friction

    C. Over voltage

    D. Vibrations

Ans. A

Sol. The slow but continous rotation of energy meter when only pressure coil is excited and there is no current flowing through the current coil (i.e under no load condition) is known as creeping. Creeping occurs due to

I. Overcompensation for friction.

II. Supply voltage is more than normal voltage

III. Stray magnetic field

IV. Vibration

22.   Rayleigh's current balance is a-

A. Secondary instrument   B. Absolute instrument

C. Integrating instrument   D. Recording instrument

Ans.   B

Sol.   Rayleigh's current balance is an example of absolute instrument. These instruments give the magnitude of the quantity under measurement in terms of physical constants and no need to calibrate these instruments with other instruments.

23.   If span length is doubled with no change in other factors, the sag of the line will become?

A. 8 times   B. 2 times

C. 0.5 time   D. 4 times

Ans.   D

Sol.   Relation between sag or deflection and span length is,

$$d = \frac{wl^2}{8T}$$

Where, d: deflection

l: span length

T: tension

$d \propto l^2$

If span length is doubled then sag or deflection will become four times.

24.   Which of the following statements is NOT true with respect to a secondary cell?

A. Wet cells   B. Rechargeable cells

C. Electrolyte in liquid form   D. Light in weight

Ans.   D

Sol.   Secondary cells can be reused by charging them. The electrolyte used in the cell remains in liquid form. These are also called wet cells. These are heavy in weight and have high initial cost.

25.   Which of the following statement is true regarding magnetization characteristics?

A. Current on X-axis and flux on Y-axis

B. Flux on X-axis and current on Y-axis

C. Magnetic field strength on Y-axis and magnetic flux density on X-axis

D. None of the above

Ans.   A

Sol.   The BH curve is drawn with current on X-axis and the flux on Y-axis is called magnetization characteristics.

According to the relation, $B \propto \phi, H \propto i$

Also, in B-H curve, magnetic flux density (B) is on Y axis and magnetic field intensity on X axis.

26. When PLC program is executed, multiple repetitive processes occurred. This process of repetition is called

A. PLC scan cycle

B. PLC counter

C. PLC rung

D. RTO

Ans. A

Sol. When PLC program is executed, multiple repetitive processes that occurred are called PLC scan cycle

27. What is the order of minimum displacement that can be measured with capacitive transducers?

A. 1×10^{-12} m

B. 1 cm

C. 1 mm

D. 1 μm

Ans. D

Sol. Capacitive displacement transducers can be a particularly accurate and sensitive means of measuring displacement over a wide range. They are equivalent to an almost perfect potential divider and when used with inductive ratio arms accuracies to 1 in 10^6 can be achieved.

28. Find the number of poles required, if the frequency is 50Hz and speed of the motor is 500 rpm.

A. 24 poles

B. 12 poles

C. 5 poles

D. 10 poles

Ans. B

Sol. Since speed $N_s = \dfrac{120f}{P}$

P = No. of pole

f = frequency

$500 = \dfrac{120 \times 50}{P}$

$P = \dfrac{120 \times 50}{500}$

P = 12

29. The voltage across a capacitor is triangular in waveform. The waveform of current is_____

A. Triangular

B. Trapezoidal

C. Sinusoidal

D. Rectangular

Ans. D

Sol. We know that $i = \dfrac{C\,dv}{dt}$

Also, triangular waveform is Ramp type

Now $\dfrac{d}{dt}(\text{Ramp type}) = \text{Step type}$

Hence, I will be of step type that means Rectangular.

30. In Bipolar Junction transistors, the type of configuration which will give both voltage gain and current gain is:

A. CB
B. CE

C. CC
D. None of the options

Ans. B

Sol. **Bipolar Transistor** is a three terminal device, there are basically three possible ways to connect it within an electronic circuit with one terminal being common to both the input and output.

CB has voltage gain but no current gain.

CE has both current and voltage gain.

CC has current gain but no voltage gain.

31. Which instrument is used to measure the high resistance?

A. Carey-Foster bridge

B. Megger

C. Kelvin's Double bridge

D. Wheat stone bridge

Ans. B

Sol. Megger is a portable instrument which is used to measure insulation resistance of the electrical machinery or system. Megger is used to measure high resistance.

32. With negative voltage feedback to an amplifier, the lower cut-off frequency of the amplifier……………………..

A. is decreased
B. is increased

C. becomes zero
D. is not changed

Ans. A

Sol. If lower cut-off frequency of an amplifier is f_1 without feedback, then with negative voltage feedback to the amplifier, the lower cut-off frequency becomes f'_1 given by ;

$$f'_1 = \frac{f_1}{1 + A_v\, m_v}$$

Clearly, lower cutoff frequency is **decreased** with negative voltage feedback.

33. An instrument transformer is used to measure____

A. Current

B. Voltage

C. Power

D. Voltage and Current

Ans. D

Sol. Current Transformers and Potential transformers are consider as Instrument transformers and they are used to measure the high current and high voltage respectively

34.   Find the source current (I) in the circuit shown below
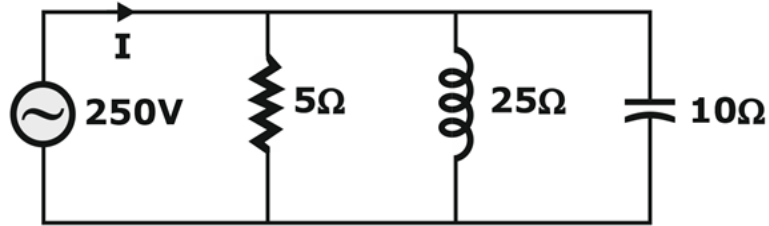
       A. 29.8 A   B. 37.2 A

       C. 52.2 A   D. 68.7 A
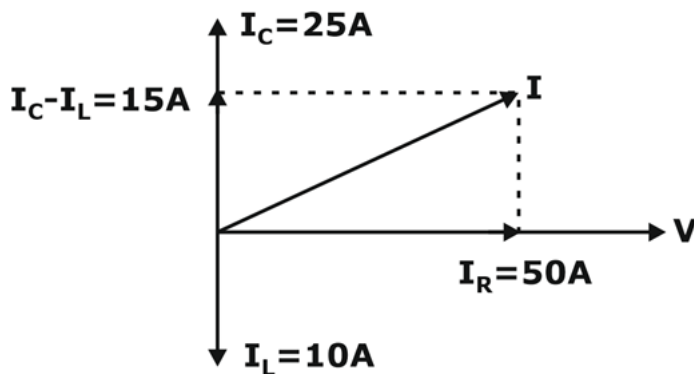
Ans.   C

Sol.   From the given figure,

$$I_R = \frac{250}{5} = 50A$$

$$I_L = \frac{250}{25} = 10A$$

$$I_C = \frac{250}{10} = 25A$$

       The phasor diagram is shown below

       $$\therefore I = \sqrt{15^2 + 50^2} = \sqrt{2725}$$

       I = 52.2 A

35.   The maximum efficiency of resistance loaded class A power amplifier is……………

       A. 78.5%   B. 50%

       C. 30%   D. 25%

Ans.   D

Sol.   A resistance loaded class A power amplifier has a maximum efficiency of 25%. It is because much of the power drawn from power supply is wasted in the amplifier itself.

36.   A spotlight of 60/п Cd is located at 4 m above the table. Also the beam is focused on a surface area of 0.16m². Find the intensity of the beam –

       A. 10000 cd   B. 20000 cd

       C. 24000 cd   D. 48000 cd

Ans.   C

Sol.   Total flux $(\phi) = 4\pi I$

$$\phi = 4\pi \times \frac{60}{\pi} = 240 \; lm$$

Luminous intensity of beam depends on solid angle θ.

$$\theta = \frac{A}{r^2}$$

$$\theta = \frac{0.16}{4^2} = 0.01$$

$$Intensity \; I = \frac{\phi}{\theta} = \frac{240}{0.01} = 24000$$

37.   The transmission line feeding power on either side of the main transmission line is called _____

A. secondary distribution   B. secondary transmission

C. primary transmission   D. primary distribution

Ans.   B

Sol.   The transmission line feeding power on either side of the main transmission line is called **secondary transmission**. For such posts, the primary voltage value is lessened to very low values. Some of the common voltage values for secondary transmission are 3.3 kV, 11 kV and 33 kV..

38.   The minimised Boolean expression for $\overline{A}(1+A)+\overline{B}(1+B)+\overline{C}(1+C)$ will be:

A. A + B + C   B. $\overline{A} + \overline{B} + \overline{C}$

C. 1   D. 0

Ans.   B

Sol.

$$\left. \begin{array}{l} \overline{A}(1+A) = \overline{A}(1) \\ \overline{B}(1+B) = \overline{B}(1) \\ \overline{C}(1+C) = \overline{C}(1) \end{array} \right\} \Rightarrow \overline{A}+\overline{B}+\overline{C}$$

39.   Which of the following statement is TRUE?

A. The resistivity of a conductor does not depend on alloying of conductor material.

B. The resistivity of a conductor does not depend on the temperature.

C. The resistivity of a conductor does not depend on the length of the conductor.

D. The resistivity of a conductor does not depend on the mechanical stress on the conductor.

Ans.   C

Sol.   The factor on which resistivity of the conductor depends on are as follows:

1) Alloying of the conductor

2) Temperature

3) Mechanical stress on the conductor

40.   In Figure, the forward biased diode is

A. $-4\,V$ ▸|—ww—$-3\,V$ B. $3\,V$ ▸|—ww—$5\,V$

C. $0\,V$ ▸|—ww—$-2\,V$ D. $-2\,V$ ▸|—ww—$+2\,V$

Ans.   C

Sol.   The diode is forward biased if arrow (anode) is at higher potential than the bar (cathode). This is true for option (iii).
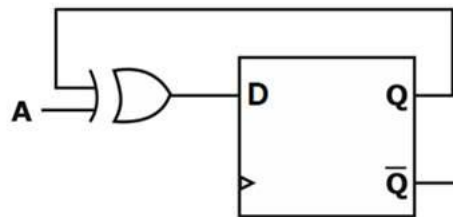
41.   Low frequency supply is obtained by

A. Motor-generator set

B. Frequency changer

C. Either Motor-generator set or Frequency changer

D. Both Motor-generator set or Frequency changer

Ans.   C

Sol.   Motor generator set or frequency changer can be used to supply a low frequency.

42.   Which type of flip-flop it is

A. SR flip flop   B. Toggle flip flop

C. Data flip flop   D. None of these

Ans.   B

Sol.

$$D = A \oplus Q$$

$$= A\bar{Q} + Q\bar{A}$$

this is the characteristics of toggle flip-flop.

If $A = 1\ D = \bar{Q}_n\ So, Q_{n+1} = \bar{Q}_n$

If $A = 0\ D = Q\ So, Q_{n+1} = Q$

43.   Speed-torque characteristic of PMDC motors is _____.

A. Starting from zero increasing continuously

B. Starting from some positive value and remaining constant

C. Starting from some positive value and decreasing exponentially

D. Starting from some positive value and decreasing on straight line

Ans.   D

Sol.   The material chosen for PMDC motor is such that speed torque characteristic of a given motor remains straight line for wider range of torque, for wider range of armature voltage. The straight line is such that it makes positive intercepts on both axes.

44.   Consider the following statements:

1) Semiconductor memories are organized as linear array of memory locations

2) To address a memory location out of N memory locations, at least log N bits of address are required

3) 8086 can address 1,048,576 addresses

4) Memory for an 8086 is set up as two banks to make it possible to read or write a word with one machine cycle

Which of the above statements are correct?

A. 1, 2 and 3 only   B. 1, 2 and 4 only

C. 3 and 4 only   D. 1, 2, 3 and 4

Ans.   C

Sol.   If we have n bits of address, then 2^n locations can be addressed. So, statement (2) is wrong. Hence, correct option will be (C)

45.   The S.I unit of electric charge is _____.

A. Henry   B. Coulomb

C. Tesla   D. Weber

Ans.   B

Sol.   The S.I unit of electric charge is coulomb.

46.   Which of the following statement is correct in regard to Electrostatic Instruments.

A. Both frequency and hysteresis error is present.

B. Power consumption is very high.

C. Scale is non-uniform.

D. It can only be used for AC measurements.

Ans.   C

Sol.   Following are the points in regard to Electrostatic instruments:

1. It is used in both AC and DC.

2. There is no frequency error.

3. There is no hysteresis error.

4. There is no stray magnetic field error.

5. It is used for high voltage.

6. Power consumption is negligible.

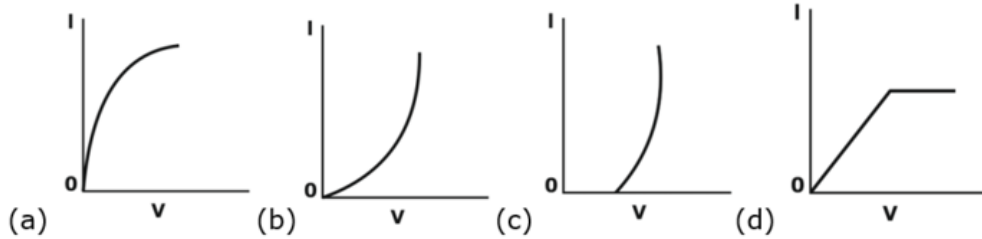7. Scale is not uniform.

8. Larger in size.

9. Cost is more.

47.   The donor type of impurity is

A. phosphorous   B. aluminium

C. Calcium   D. iron

Ans.   A

Sol.   Donor type impurity belongs to 5TH group. They have five electrons in their outer shell.

5TH group have elements - phosphorus, arsenic, bismuth etc.

48.   In the figure the forward characteristics of a silicon diode are represented by
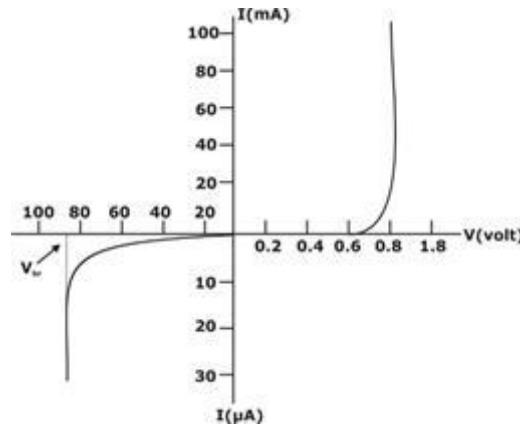

A. (a)   B. (b)

C. (c)   D. (d)

Ans.   C

Sol.   The diode characteristics is given below.

When we apply the positive voltage to the P side and negative voltage to the N side. Diode is in forward bias condition and after the cut in voltage its start conducting.

49.   If closed loop transfer function is 5/s+1 then, open loop transfer function is

A. Stable   B. Unstable

C. May be stable or unstable   D. None

Ans.   B

Sol.   Given:

$$CLTF = \frac{5}{s+1}$$

So, $OLTF = \frac{CLTF}{1-CLTF} = \frac{\frac{5}{s+1}}{1-\frac{5}{s+1}} = \frac{5}{s-4}$

At s = 4 a pole lies which is at right side of s plane

Therefore, system is unstable

50.   Which of the following expressions is equivalent to _____.

$$AB + \overline{(A + \overline{C})(\overline{B} + \overline{C})}$$

A. $AB + \overline{A}C$ B. $B + C$

C. $A\overline{B} + \overline{A}\overline{C}$ D. $\overline{A}B + A\overline{C}$

Ans.   A

Sol.

$$AB + \overline{(A + \overline{C})(\overline{B} + \overline{C})} = AB + \overline{(A + \overline{C})} + \overline{(\overline{B} + \overline{C})}$$
$$= AB + A\overline{C} + BC$$
$$= AB + A\overline{C}$$

(By consensus theorem)

51.   What is the angle between (in degrees) the planes of two moving coils & a dynamometer type 3-phase power factor meter?

A. 0   B. 60

C. 90   D. 120

Ans.   D

Sol.   A dynamometer type 3-phase power factor meter has its moving coil planes at an angle of 120° to correspond to the 3-phases.

52.   Locked rotor current of a shaded pole motor is:

A. slightly more than full load   B. less than full load current

C. equal to full load current   D. several times the full load

Ans.   A

Sol.   Locked rotor is a case when rotor isn't allowed to rotate by supplying rated voltage. Under this condition, the rotor winding cut the rotating flux without rotating which is equivalent to short circuit of a transformer secondary. So, locked rotor current is actually short circuit current in a motor.

53.   2's complement of $(-54)_{10}$ is:

A. 11001010   B. 11110101

C. 11111010   D. 11000101

Ans.   A

Sol.

$$+54 \xrightarrow[\text{comp.}]{2^5} 00110110$$
$$\downarrow 2^5$$
$$-54 \longrightarrow 11001010$$

54.   Dummy strain gauge is used in conjunction with the main strain gauge to _____.

A. calibrate the system   B. compensate temperature effects

C. improve sensitivity   D. reduce strain on the gauge

Ans.   B

Sol.   The other gauge is isolated from all mechanical stress, and acts merely as a temperature compensation device (the "dummy" gauge). If the temperature changes, both gauge resistances will change by the same percentage, and the bridge's state of balance will remain unaffected. Only a differential resistance (difference of resistance between the two strain gauges) produced by physical force on the test specimen can alter the balance of the bridge.

55.   After welding, the welded parts retain which properties of the metal?

    A. Melting point   B. Density

    C. Thermal conductivity   D. All of these

Ans.   D

Sol.   After welding, the welded parts will regain their following properties with some operations to be carried out on them.

    1. Melting point

    2. Density

    3. Thermal conductivity

56.   For d.c. system, the string efficiency is

    A. 50%   B. 75%

    C. 85%   D. 100%

Ans.   D

Sol.   For DC voltages, insulator capacitances are ineffective and voltage across each unit would be the same. This is why string efficiency for DC system is **100%**.

57.   A motor which can conveniently be operated at lagging as well as leading power factors is the

    A. squirrel cage induction motor.   B. wound rotor induction motor.

    C. synchronous motor.   D. DC shunt motor.

Ans.   C

Sol.   Induction motor always operates lagging power factor.

    But synchronous motor can operates at both lagging and leading P.F.

    For $E > V_t$ Cosf. → Over excitation → synchronous motor operates at leading P.F.

    For $E = V_t$ Cosf → level excitation → synchronous motor operates at unity P.F.

    For $E \propto V_t$Cosf under excitation → synchronous motor operates at lagging P.F.

58.   Multimeters cannot measure the value of _____.

    A. voltage   B. current

    C. resistance   D. phase angle

Ans.   D

Sol.   multimeter can't measure phase angle.

59.   How many type of control systems are there for SCADA systems?

    A. One   B. Two

    C. Three   D. None of the above

Ans.   B

Sol.   There are two types of control systems are there for SCADA systems they are centralized control system and distributed control system

60.   Which one of the given fuse is bigger _____?

A. DC   B. AC

C. DC or AC   D. AC and DC are same

Ans.   A

Sol.   Always DC resistance is less than A.C resistance i.e. $R_{AC} = 1.6 R_{DC}$

i.e. I_{DC} is more than I_{AC}

∴ so, DC fuse rating more than that of AC fuse rating.

61.   Base load of a power station stands for

A. 12 -24 hours/day   B. 8 – 12 hours/day

C. 4 -8 hours/ day   D. 2 -4 hours/day

Ans.   B

Sol.   *Base load* is the minimum level of electricity demand required over a period of 24 hours. It is needed to provide *power* to components that keep running at all times (also referred as continuous *load*). Peak *load* is the time of high demand.

62.   Which of the following lamp gives nearly monochromatic light?

A. Sodium vapour lamp   B. GLS lamp

C. Tube light   D. Mercury vapour lamp

Ans.   A

Sol.   Sodium Vapour lamp gives nearly monochromatic light

63.   Which one of the following A.C. bridge is preferred to measure self-Inductance from known mutual inductance?

A. Maxwell Inductance Capacitance Bridge

B. Anderson's Bridge

C. Heaviside Bridge

D. Heaviside Compbell Bridge

Ans.   D

Sol.   Heaviside Compbell Bridge is preferred to measure Self Inductance L from known mutual inductance M.

64.   If the spring in PMMC instrument breaks then what happens to the deflecting torque.

A. Deflecting torque is reduced.   B. Deflecting torque is 0

C. Deflecting torque is increased   D. None of the above.

Ans.   B

Sol.   Since spring is connected in series with the coil So, if spring breaks, current in the coil becomes 0, due to which deflecting torque becomes 0 So pointer returns to 0 position.

65.   Buchholtz relay is operated by

A. eddy currents   B. gas pressure

C. electromagnetic induction   D. electrostatic induction

Ans.   B

Sol.   Buchholz relay is operated by gas pressure. Buchholz relay is used for protection against internal faults.

66.   Consider the following statement:

1) Norton's equivalent is reciprocal of Thevenin's equivalent.

2) Thevenin resistance is equal to Norton's resistance.

3) Norton's theorem is applicable to two terminals linear and active network.

Which of these statement(s) is/are correct?

A. 1 and 2 only   B. 2 and 3 only

C. 1 and 3 only   D. 1, 2 and 3

Ans.   B

Sol.   By using source transformation we can convert a Thevenin equivalent into Norton's equivalent or Vice-Versa other statement are correct.

67.   The D.C. motor having the high starting Torque is _____.

A. Series motor   B. Shunt motor

C. Differential compound motor   D. None of these

Ans.   A

Sol.   In case of series motor the flux produced is directly proportional to the armature current. Hence torque is directly proportional to the square of armature current. So as current during starting is 1.5 times the rated so starting torque is higher for series motor.

68.   The given figure is of which type of MOSFET?
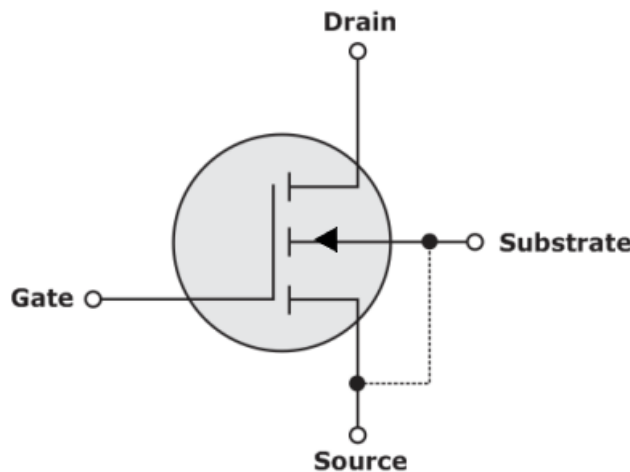
A. N-Channel Enhancement Type   B. P-Channel Enhancement Type

C. N-Channel Depletion Type   D. P-Channel Depletion Type

Ans.   A

Sol.   The above model is of N-Channel Enhancement Type. In N-Channel Enhancement type MOSFET as much V_{GS} greater than V_t, the channel formed for the conduction of Field Effect Transistor is more enhanced hence it is called as enhancement type.

69. In 3-φ measurement using two wattmeter method, Both the wattmeter had identical readings. The power factor of the load is –

A. Zero   B. Unity

C. 0.8 lagging   D. 0.8 leading

Ans. B

Sol. If wattmeter's reading is identical means $W_1 = W_2$

then $\cos\phi = \cos\left[\tan^{-1}\left(\dfrac{\sqrt{3}\left(W_1 - W_2\right)}{W_1 + W_2}\right)\right]$

power factor = $\cos^\phi$ = 1(unity)

70. Among the following characteristic, which statement is incorrect for the tunnel diode.

A. It has large forward voltage drop

B. dynamic conductance is negative

C. excellent conductor in reverse direction

D. Thickness of the Barrier is very small

Ans. A

Sol. When the concentration of impurity is increased to 1 part in 10^3, the characteristic of p-n junction diode changes significantly & this p-n junction diode is called tunnel diode.

Characteristic of Tunnel diode:
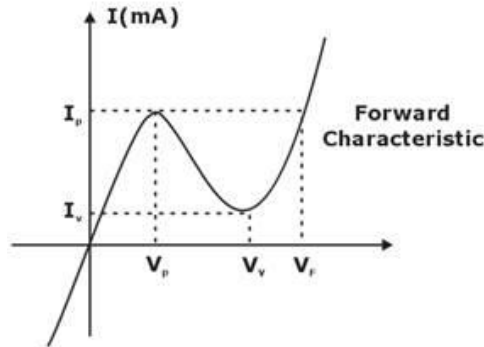
1. Impurity concentration is high.

2. Depletion width ≈ 100 Å

3. Barrier thickness very small

4. Excellent conductor in Reverse direction

5. Thickness of Barrier is about 1/5 of visible light

71. The purpose of providing a choke in the tube-light is

A. to eliminate the corona effects   B. to avoid radio interference

C. to improve power factor   D. to limit current to appropriate value

Ans. D

Sol. To limit the current to appropriate value, Chokes are provided in tube lights. The function of choke is to provide high voltage enough for ionization to take place in a tube light and after establishment and substenance of ionization, limit the voltage across the tube. Choke is an inductive coil and which helps to limit the over current and voltage.

72. The meaning of uploading in PLC is _____.

    A. Transferring program from programming device.

    B. Transferring program from output device to PLC

    C. Transferring user program from PLC to programming device.

    D. Transferring program from memory to PLC's.

Ans. C

Sol. • Most of the PLC use the term 'upload' to mean transfer from the PLC, and 'download' to mean transfer to the PLC.

73. Convert the given binary number into octal number.

    A. 27.523   B. 54.52

    C. 27.25   D. None of above

Ans. A

Sol. | 010 | 111.101 | 010 | 000

    27.520

74. Consider the following statements for the output of the logic gate is 1. When all the input are at logic 0.

    (1) NAND gate and NOR gate

    (2) EX-NOR gate

    Which of the above statements is/are correct?

    A. 1 only   B. 2 only

    C. both 1 and 2   D. Neither 1 nor 2

Ans. C

Sol. The output of the logic gate is 1. When all the input are at logic 0 for NAND, NOR, EX-NOR gates.

75. In case of travelling cranes, the motor preferred for boom hoist is _____.

    A. slip ring induction motor   B. squirrel cage induction motor

   C. synchronous motor   D. single phase motor

Ans. A

Sol. For hoisting and lowering of crane requires high starting torque. Hence ac slip ring induction motor, Ward Leonard controlled DC shunt motors are preferred.

76. For proper operation of a transistor, its collector should have

    A. Proper forward bias   B. Proper reverse bias

    C. Very small size   D. None of these

Ans. B

Sol. For the proper operation of the transistor, its collector terminal must be properly reversed biased.

77. Two lamps, Green (G) and Red (R) are connected in a motor circuit as shown in the fig. The conditions under which the lamps will burn are? (Supply is available at terminals A & B)
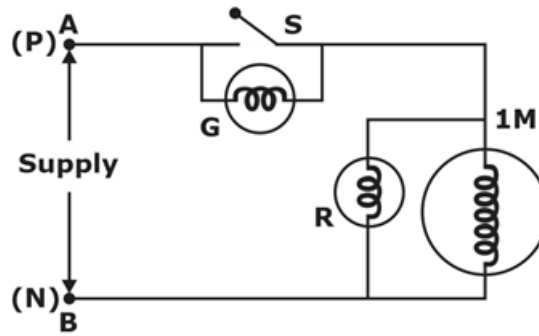
A. Green lamp will not burn always, red lamp burns only when switch 'S' is closed.

B. Green lamp burns only when 'S' is open and red lamp burns only when 'S' is closed.

C. Green lamp burns always, red lamp burns only when switch 'S' is closed.

D. Green and red lamp burns when switch 'S' is closed.

Ans.   B

Sol.   When S is open The current will flow through Green lamp and it will burn. But when S is closed then current will get short circuit path through S and it will not flow through green lamp. Now current will pass through R and lamp Red will burn.

78.   Which IE rule is applicable to service mains?

A. Rule 30   B. Rule 33

C. Rule 77   D. All of these

Ans.   D

Sol.   The following are the IE rules applicable for service mains:

1. Rule 30

2. Rule 33

3. Rule 77

79.   Which of the following does not lie in the category of systematic errors.

A. Instrumental error   B. Environment error

C. Observational error   D. Random error

Ans.   D

Sol.   There are 3 major types of errors:

1. Gross Error

2. Systematic Error:

a) Instrumental error

b) Environmental error

c) Observational error

3. Random Error

80.   In a Three phase system, the volt ampere rating is given by?

A. $V_{ph} I_{ph}$ B. $3 V_L I_L$

C. $V_L I_L$ D. $\sqrt{3} V_L I_L$

Ans.   D

Sol.   VA for single phase = $V_L I_L$

VA for 3 phase system = $\sqrt{3} V_L I_L$

81.   Material used for making knife switch is

A. nickel

B. aluminium

C. brass

D. nichrome

Ans.   C

Sol.   Brass is generally used for mailing lenite switch.

82.   A full adder can be implements by the following gates

1) 9 NAND gate

2) 9 NOR gate

3) 2 Ex-OR, 2 AND, 1 OR, gates

A. 1 only

B. 2 and 3 only

C. 1 and 3 only

D. 1, 2 and 3

Ans.   D

Sol.   Full adder can be implemented by 9 NAND or 9 NOR

or 2Ex-OR, 2AND, 1 OR gates.

83.   To supply peak load of a power station, …………….. power plant is very suitable.

A. thermal

B. nuclear

C. diesel

D. none of the above

Ans.   C

Sol.   Peak load power stations deliver power for brief intervals in a day. Such stations must be put in service very quickly. Consequently, they are equipped with prime movers such as diesel engines and gas turbines that can be started up in a few minutes. It may be mentioned here that thermal power stations take from 4 to 8 hours to start up while nuclear stations may take several days.

84.   Economizers improve boiler efficiency by

A. 1 to 5%

B. 4 to 10%

C. 10 to 12%

D. 12 to 14%

Ans.   B

Sol.   Economizers generally improve the boiler efficiency by 4 to 10 %

85.   The fuse is installed in which of the following wire?

A. Neutral

B. Phase

C. earth

D. All options are correct

Ans.   B

Sol.   A fuse is a protective device against the overcurrent fault. So we connect the fuse in series with phase as the load current flows through it and when an abnormal condition happens(overload)above the rated current of the fuse that melts down and breaks the circuit from electric potential.

Suppose in the single phase we did connect a fuse in neutral instead of phase when the fault is in the equipment then the fuse will blow in neutral also, but the potential will be still present in the equipment as phase will be still present in the equipment. Also, a fuse should completely isolate the load or wiring from the supply by its burn off or on removal. Since, neutral is not a live conductor coming from the source, disconnecting a neutral line can only open the current path through neutral. But the live phase still carries the charge. It always provides a live supply at the conductors or to the load.

86. In a d.c. series motor the electromagnetic torque developed is proportional to

A. I_a B. I_a^2

C. $\dfrac{1}{I_a}$ D. $\dfrac{1}{I_a^2}$

Ans.   B

Sol.   In the DC series motor

$I_a \propto \varphi$

$\tau \propto \varphi\, I_a$

$\tau \propto (I_a)\,(I_a)$

$\tau \propto (I_a)^2$

87. If voltage is increased by n times, the size of the conductor would

A. increase by n times   B. reduce by 1/n times

C. increase by n^2 times   D. reduce by $1/n^2$ times

Ans.   D

Sol.

$P = VI\cos\varphi$

$P_L = I^2 R$

$P_L = \left(\dfrac{P}{V\cos\phi}\right)^2 \left(\dfrac{\rho L}{A}\right); R = \dfrac{\rho L}{A}$

$P_L = \dfrac{P^2}{V^2 \cos^2\phi} \cdot \dfrac{\rho L}{A}$

$A = \dfrac{P^2}{P_L \cos^2\phi} \cdot \dfrac{\rho L}{V^2}$

$A \propto \dfrac{1}{V^2}$

$\left(\dfrac{V_2}{V_1}\right)^2 = \dfrac{A_1}{A^2}$

$\left(\dfrac{nV_1}{V_1}\right)^2 = \dfrac{A_1}{A_2} \Rightarrow A_2 = \dfrac{1}{n^2} A_1$

88. The synchronous motor is not inherently self-starting because

   A. There is no starting device to accelerate the rotor to near synchronous speed

   B. a rotating magnetic field does not have enough poles

   C. the rotating magnetic field is produced by only 50 Hz frequency currents

   D. None of these

Ans.   A

Sol.   The synchronous motor is not inherently self-starting because there is no starting device to accelerate the rotor to near synchronous speed.

89. Silicon has a preference in IC technology because?

   A. it is an indirect semiconductor   B. it is a covalent semiconductor

   C. of the availability of nature oxide SiO   D. it is an elemental semiconductor

Ans.   C

Sol.   There are several reasons Silicon has become the preferred semiconductor in the present, over Germanium.

   First reason is that Si forms on its surface very easily a thin layer of SiO_2 which is a very good insulator and which technologically can be very easily processed. This layer of oxide is very useful to form the gates of MOSFET transistors (it is situated between the gate and the channel). Also this layer is very useful when one wants to form the junctions in a transistor because it acts as a masking layer that prevents the diffusion of the dopants in the regions it protects.

90. Which IE rule gives instruction for the restoration of persons suffering from electric shock.

   A. IE Rule 37   B. IE Rule 38

   C. IE Rule 39   D. IE Rule 44

Ans.   D

Sol.   Some rule as gives:

   IE Rule 30: for services lines and apparatus on consumer's premises.

   IE rule 37: for supply to vehicles, cranes etc.

   IE rule 38: for cable and portable and transportable apparatus.

   IE rule 39: for protection of cables by bituminous materials.

   IE rule 44: Instruction for the restoration of person suffering from electric shock.

   IE rule 73: for supply to X-ray and high frequency installation.

91. What is SCADA?

   A. Software   B. Process

   C. System   D. Hardware

Ans.   B

Sol.   SCADA is a process that uses networked data communications, graphical user interface, and computers for high-level process supervisory management. It uses devices such as programmable logic controller (PLU) and PID.

92.   Regenerative braking

A. Can be used for stopping a motor.

B. Cannot be easily applied to DC series motors.

C. Can be easily applied to DC shunt motors

D. Cannot be used when motor load has overhauling characteristics.

Ans.   B

Sol.   Because reversal of I_a would also mean reversal of field and hence of E_b

Regenerative breaking:

In this Ia must be reversed.

In the DC series motor

$\varphi \propto I_a$

If I_a is $-V_e$ of Ia than

$\varphi \propto -V_e$

$\psi \propto \varphi \ I_a$

$\psi \propto (-V_e)(-V_e)$

$\psi \propto + V_e$

Torque remains in the same direction. So it is difficult to break the DC series motor by this method.

93.   For a closed loop control system, Negative feedback

A. Decreases the gain   B. Increases the Bandwidth

C. Both A & B are correct   D. Neither A nor B is correct

Ans.   C

Sol.   Negative feedback

(i) Reduces Gain

(ii) Increases B.W

(iii) Make system more Accurate

(iv) Decreases sensitivity to parameter variation

94.   Which one the following instrument is used at frequency of zero Hz?

A. D'Arsonval Galvanometer   B. Vibrational Galvanometer

C. Head Phone   D. Tunable Detector

Ans.   A

Sol.   D'Arsonval Galvanometer is used at Frequency of Zero Hz.

Vibrational Galvanometer → 5 Hz – 200 Hz

Head Phone → 200 Hz - 1000 Hz

Tunable Detector → 1000 Hz

95.   What load R_C does the load line 1 represent in Fig.? Assume resistance R_E in the emitter is zero.

A. 10 kΩ   B. 15 kΩ

C. 20 kΩ   D. 25 kΩ

Ans.   A

Sol.   Collector load,

$$R_c = \frac{V_{cc}}{I_{c(max)}} = \frac{20\ V}{2\ mA} = 10\ k\Omega$$

96.   For improving the power factor of coreless type induction furnace,

A. Capacitor is used   B. Inductor is used

C. Resistor is used   D. Transistor is used

Ans.   A

Sol.   For improving the power factor of coreless type induction furnace, capacitor is used. The heart of the coreless induction furnace is the coil, which consists of a hollow section of heavy duty, high conductivity copper tubing which is wound into a helical coil. Coil shape is contained within a steel shell and magnetic shielding is used to prevent heating of the supporting shell.

97.   Which one of the following transducer convert Linear motion into electrical signal?

A. Tachometer   B. Strain Gauge

C. RTD   D. LVDT

Ans.   D

Sol.   1) The most widey used Inductive tranducer to translate the inear motion into eectrical signal is LVDT.

2) In LVDT the output voltage is practically linear for displacement upto 5mm.

3) Linearity of 0.05% available in commercial LVDT.

98.   Which of the following is not an indoor lighting?

A. Residence light   B. Office light

C. Industry light   D. flood light

Ans.   D

Sol.   Food light is a broad beaned high intensity artificial light. They are more after used illuminate the outdoor playing.
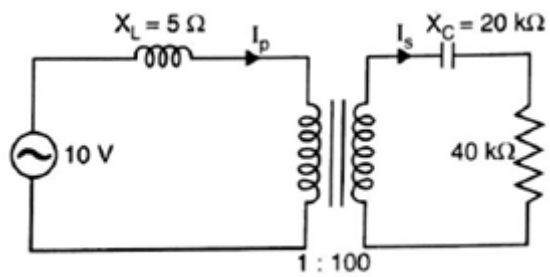
99.   The advantage of rectifier type welding set is

A. Reduced no-load losses   B. Easy arc starting

C. Less hazardous   D. Both (a) and (b)

Ans.   D

Sol.   The advantage of rectifier type welding set are as follows:

1. reduced no load losses

2. easy arc starting

100.   The secondary current I_s in Fig. is…………………….

A. 1.25 A   B. 50 A

C. 0.02 A   D. none of the above

Ans.   C

Sol.   Primary current,

$I_p = 10/X_L = 10/5 = 2$ A

Now, $N_p I_p = N_s I_s$

∴ $I_s = \dfrac{N_p}{N_s} I_p = \dfrac{1}{100} \times 2 = 0.02$ A

101.   For stable systems, which of the following is true?

A. Gain cross over frequency > Phase cross over frequency

B. Gain cross over frequency = Phase cross over frequency

C. Gain cross over frequency < Phase cross over frequency

D. None of these

Ans.   C

Sol.   For stable systems,

Gain cross over frequency < Phase cross over frequency

For unstable systems,

Gain cross over frequency > Phase cross over frequency

For marginally stable systems,

Gain cross over frequency = Phase cross over frequency

102.   Gray code equivalent of binary number 101101 is

A. 101010   B. 111000

C. 111011   D. 100111

Ans.   C

Sol.   Binary to Gray code conversion
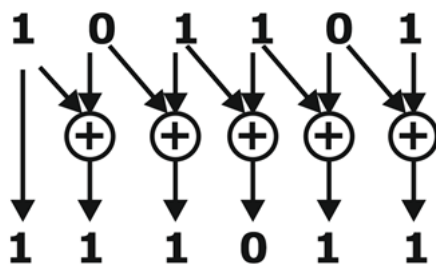
103.   Stability of a system is not affected by_____.

A. reactance of line   B. losses

C. reactance of generator   D. output torque

Ans.   B

Sol.   The seven essential factors affecting the stability are broadly classified into two parts

1) **Mechanical factors:**

1) Prime mover input torque

2) The inertia of prime mover and generator

3) The Inertia of motor and shaft load

4) Shaft load output torque

2) **Electrical factors:**

1) Internal voltages of the synchronous generator

2) The reactance of the system including the generator, line, and motor etc.

3) Internal voltage of the synchronous motor

104. The voltage gain of a tuned amplifier is ………. At the resonant frequency.

A. Maximum

B. Minimum

C. Zero

D. Date incomplete

Ans. A

Sol. Voltage gain = $\dfrac{\beta Z_C}{Z_{in}}$

Here, Z_C = effective collector load; Z_{in} = input impedance of the amplifier the value of Z_C of a tuned amplifier is maximum at resonant frequency.

Therefore, voltage gain of a tuned amplifier is maximum at the resonant frequency.

105. Which of the following motors will be used in electric clocks

A. D.C. series motor

B. D.C. shunt motor

C. synchronous motor

D. A.C. induction motor

Ans. C

Sol. In electric clocks A.C synchronous motors are used as synchronism with the frequency is required.

106. When the current through the coil of an electromagnet reverses, the:

A. magnetic field collapses

B. direction of the magnetic field reverses

C. direction of the magnetic field remains unchanged

D. magnetic field expands

Ans. B

Sol. When you change the direction of current, the curl magnetic field will just reverse the direction. If with the former current direction the magnetic field were clockwise, now on reversing the direction, the magnetic field will be counter clockwise.

107. In an ASCII code, X shows 1000001, Y shows 1000010 and Z shows 1000011, then integer string 10000111000011000010 will be written as:

A. ZXY

B. YXZ

C. ZZY

D. XYZ

Ans. A

Sol. In a string, analyse initially the alphabets as numbers and choose the right selection. From the above, X = 1000001, Y = 1000010 and Z = 1000011, so string 10000111000011000010 be written as ZXY.

108. The maximum power developed in a synchronous motor will depend on

A. the rotor excitation and supply voltage

B. the rotor excitation, supply voltage and maximum value of coupling angle

C. the supply voltage only

D. the rotor excitation only

Ans.   B

Sol.   The rotor excitation, supply voltage and maximum value of coupling angle.

Ex. $P = \dfrac{E_f V_t}{X_s} \sin \delta$

109. For the given Signal flow Graph, no. of Loops is ____
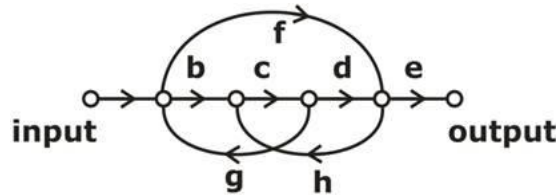
A. 1   B. 2

C. 3   D. 4

Ans.   C

Sol.   Individual loops:

1. b-c-g,

2. c-d-h,

3. f-h-c-g

So, total 3 loop exist in given signal flow graph

110. Telephone companies make use of the Wheatstone bridge for

A. Computing line strength

B. Locating cable faults

C. Measuring the telephone wire resistance

D. Maintaining Dial tone

Ans.   B

Sol.   Cable faults in telephone line are detected by using Wheatstone bridge.

111. Which one of the following is not necessary for the parallel operation of Alternator?

A. Terminal voltage of incoming machines & the running alternator must be same.

B. The frequency of two voltage source nearly same.

C. The phase sequence of two alternators must be same.

D. None of the above.

Ans.   D

Sol.   For the parallel operation of Alternator three condition are necessary to meet:

1) Terminal voltage of incoming machines & the already running alternator must be same.

2) The frequency of two voltage source nearly same.

3) The two voltages must be in the same phase sequence with respect to external load, or we can say the phase sequence of two alternators must be same.

112. Which of the following plants has the maximum capital cost?

A. steam plant

B. diesel plant

C. hydro-plant

D. nuclear plant

Ans. C

Sol. The fuel used in nuclear plant is very expensive and the capital cost in hydro power plant is very high as compared to other types of plants.

113. Overall efficiency of Nuclear Power Plant approximately is

A. 80% to 85%

B. 60% to 70%

C. 45% to 55%

D. 30% to 40%

Ans. D

Sol. The Nuclear Power Plant has an overall efficiency of about 32% to 35%.

114. According to IE rule colour of earth wire is?

A. Red

B. Yellow

C. Black

D. Green

Ans. D

Sol. According to IE rule colour of earth wire is green.

Supply type	Type of wire	Colour
Single-phase	Phase	Red
	Neutral	Black
	Earth	Green
Three-phase	Phase-1	Red
	Phase -2	Yellow
	Phase -3	Blue
	Neutral	Black
	Earth	Green

115. Oil-filled cable has a working stress of _____ kV/mm

A. 10

B. 12

C. 13

D. 15

Ans. D

Sol. This is defined by dielectric strength of mineral oil i.e. 15 kV/mm.

116. The Ebers-Moll model is applicable to:

A. JFET

B. BJT

C. NMOS transistor

D. UJT

Ans. B

Sol. The Ebers-Moll BJT Model is a good large-signal, steady-state model of the transistor and allows the state of conduction of the device to be easily determined for different modes of operation of the device. The different modes of operation are determined by the manner in which the junctions are biased.

117. Which of the following statement is not true about PMMC (permanent magnet moving coil) type instruments?

A. Friction and temperature error are present.

B. Error is produced due to ageing effect.

C. Torque to weight ratio is low.

D. Scale is uniform.

Ans. C

Sol. Following are the points regarding PMMC type instruments:

1. PMMC type instruments can only be used for DC measurements.

2. Error in PMMC type instruments occurs due to ageing effect.

3. Range of the PMMC type instruments can be extended.

4. Torque to weight ratio is high.

5. Scale is uniform.

6. Power consumption is less in PMMC type instruments.

7. The effect of stray field is negligible because operating magnetic field is very strong.

8. Friction and temperature error are present.

118. Resonance frequency of the circuit shown below is
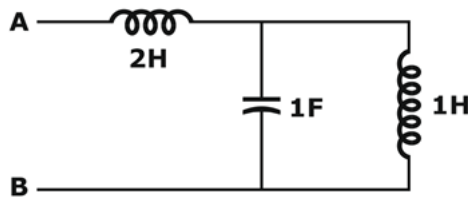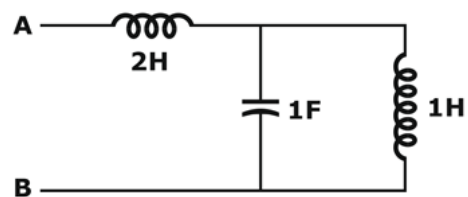

A. 3 rad/sec   B. 5 rad/sec

C. $\sqrt{\dfrac{3}{2}} \, rad/sec$ D. $\sqrt{\dfrac{2}{3}} \, rad/sec$

Ans. C

Sol.

Impedance at frequency ω rad/ sec

$$z = 2j\omega + \frac{(j\omega \times 1) \times \dfrac{1}{j\omega \times 1}}{j\omega + \dfrac{1}{j\omega \times 1}}$$

$$z = 2j\omega + \frac{j\omega}{1 - \omega^2}$$

$$z = j\left(2\omega + \frac{\omega}{1-\omega^2}\right)$$

$$z = j\left(2\omega + \frac{\omega}{1-\omega^2}\right)$$

For calculation of resonance frequency imaginary part of z = 0

$$\left(2\omega + \frac{\omega}{1-\omega^2}\right) = 0$$

ω = 0 (not possible)

and

$$2 + \frac{1}{1-\omega^2} = 0$$

$2 - 2\omega^2 + 1 = 0$

$2\omega^2 = 3$

$$\omega^2 = \frac{3}{2}$$

$$\Rightarrow \omega = \sqrt{\frac{3}{2}} \, rad/sec$$

119. A 150 V moving iron voltmeter of accuracy class 1.0 reads 75 V when used in a circuit under standard conditions. The maximum possible percentage error in the reading is:

A. 4.0   B. 0.5

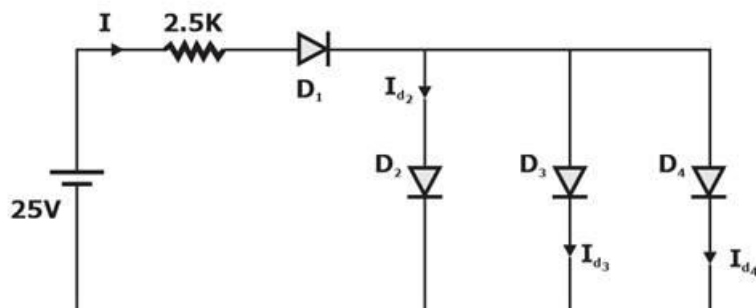C. 2.0   D. 1.0

Ans. C

Sol. Class 1.0 means guaranteed accuracy of 1%

$\pm 1\% \, of \, 150 \, V \, is \, \pm 1.5$ V

Now,

$75 \times \dfrac{Limiting \, error}{100} = \pm 1.5$

Limiting error = 2V

120. For the below circuit, If diode D_1, D_2 & D_4 are silicon diodes & Diode D_3 is Germanium diode then :
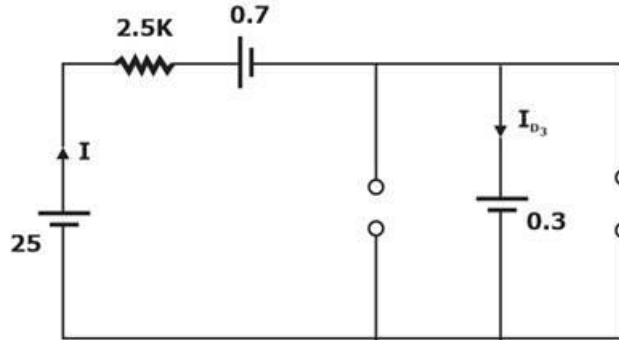
A. $I_{d2} > I_{d3}$; $I > I_{d2}$

B. $I > I_{d3}$; $I_{d2} = I_{d4}$

C. $I > I_{d4}$; $I_{d2} = I_{d3}$

D. $I_{d3} > I_{d4}$; $I = I_{d3}$

Ans. D

Sol. Silicon diode has forward bias voltage of 0.7V

Germanium diode has forward bias voltage of 0.3V

Hence when Germanium diode get activated it develop voltage of 0.3V. This 0.3V will restrict silicon diode from activating.

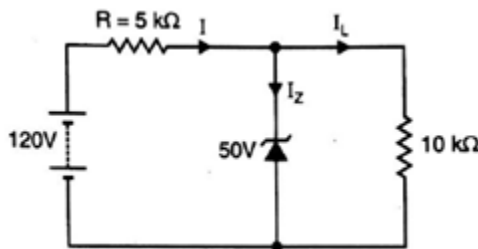$$I = \frac{25 - 0.7 - 0.3}{2.5} = \frac{24}{2.5} mA = I_{D_3}$$

= 9.6mA

121. In large machines flat copper strips known as

A. windings

B. Bushes

C. risers

D. Either of these

Ans. A

Sol. In large machines, flat copper strips known as risers.

122. If in Fig., zemer has an impedance of 10 Ω, then output voltage is

A. 50.9 V

B. 100.2 V

C. 75.9 V

D. 46.2 V

Ans. A

Sol. Output voltage $= V_z + I_z Z_z = 50 + 90mA \times 10\Omega = 50.9V$

123. Which type of fire extinguisher in not suitable for electric fire

A. foam extinguisher

B. carbon dioxide extinguisher

C. Soda acid extinguisher

D. dry powder extinguisher

Ans. C

Sol. The water/soda mixture is conductive and will short out the electrical equipment and cause rapid corrosion damage. The electrical equipment will likely be damaged or destroyed beyond the damage from the fire itself. In a worst-case situation, the electrical current could be conducted back to the operator or others in the area causing injury or death.

124. The permissible voltage drop from supply terminal to any point on the wiring system should not exceed?

A. 4% + 1 volt   B. 2% + 1 volt

C. 1% + 1 volt   D. 3% + 1 volt

Ans. D

Sol. Voltage Drop - The purpose of the National Electrical Code (NEC) is to help safeguard persons and property from electrical hazards. Although it does not generally consider voltage drop a safety issue, it contains six Fine Print Notes (FPNs) that recommend you size circuit conductors large enough to provide reasonable efficiency of equipment. The permissible voltage drop from supply terminal to any point on the wiring system is 3%+1V.

125. A Graph has 8 branch and 6 node the number of independent KCL equation and No. of independent KVL equation respectively are-

A. 3 & 5   B. 5 & 4

C. 5 & 3   D. 4 & 5

Ans. C

Sol. No. of node n = 6

No. of branch b = 8

we know that

No. of KCL equation = n − 1 = 6 − 1 = 5

No. of KVL equation = b − (n − 1) = 8 − (6 − 1) = 3

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