

Question 1:

'The Barkhausen criterion for an oscillator', A. 'Loop gain should be unity', B. 'Loop gain should be less than unity', C. 'The phase of a feedback signal with respect to input should be 0° or 360° ', D. 'Both A and C'

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Answer Option 1:

The Barkhausen criterion for an oscillator is that the loop gain should be unity (or greater) and the phase of a feedback signal with respect to input should be 0° or 360° . Final answer: D

Answer Option 2:

The Barkhausen criterion states that for sustained oscillations in any feedback circuit, the loop gain should be unity and the phase of a feedback signal with respect to the input should be 0° or 360° (i.e. a multiple of 2π). Final answer: D

Answer Option 3:

The Barkhausen criterion for an oscillator requires both that the loop gain should be unity (meaning that it's neither amplifying nor attenuating the signal) and that the phase of a feedback signal with respect to input should be 0° or 360° (meaning that it's in phase with the original). Final answer: D

Answer Option 4:

The Barkhausen criterion for an oscillator states that for sustained oscillations, the total phase shift around a loop must be 0° or 360° and the loop gain must be unity. Final answer: D

Answer Option 5:

The Barkhausen criterion for an oscillator states that the total phase shift around a loop is 0° or an integral multiple of 360° and the gain around the loop should be unity. Final answer: D

Answer Option 6:

The Barkhausen criterion for an oscillator states that the loop gain should be unity and the phase of a feedback signal with respect to input should be 0° or 360° . Final answer: D

Answer Option 7:

The Barkhausen criterion for an oscillator states that for sustained oscillations, the total phase shift around a loop must be an integral multiple of 360° and the gain around the loop must be unity. Final answer:

D

Answer Option 8:

The Barkhausen criterion specifies that for an electronic oscillator to start oscillation, the total phase shift around a loop must be an integral multiple of 360° and the total gain around the loop must be greater than or equal to one. Therefore, the correct answer is D. 'Both A and C'.

Answer Option 9:

The Barkhausen stability criterion is a mathematical principle for systems that can sustain oscillations or steady state behavior. According to this criterion, for steady state oscillations to exist in a system, it is necessary that the total phase shift around a loop is zero or an integral multiple of 2π (360°) and the loop gain magnitude is equal to one. Final answer: D

Question 2:

'Potentiometer method of DC voltage measurement is more accurate than direct measurement using a voltmeter because', A. 'It loads the circuit moderately.', B. 'It loads the circuit to maximum extent.', C. 'It uses centre zero galvanometer instead of voltmeter.', D. 'It does not load the circuit at all.'

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Answer Option 1:

Final answer: D

Answer Option 2:

The potentiometer method is more accurate because it does not load the circuit at all. Final answer: D

Answer Option 3:

The potentiometer method of DC voltage measurement is more accurate than direct measurement using a voltmeter because it does not load the circuit at all. Final answer: D

Answer Option 4:

The potentiometer method is more accurate because it does not load the circuit at all. Final answer: D

Answer Option 5:

The Potentiometer method is the most accurate because it does not draw current from the circuit under test, and thus it does not load the circuit. Final answer: D

Answer Option 6:

Potentiometer method is more accurate because it does not draw any current from the circuit while measuring the voltage. Therefore, it does not load the circuit at all. Final answer: D

Answer Option 7:

Potentiometer method of DC voltage measurement is more accurate than direct measurement using a voltmeter because it does not draw any current from the circuit being tested, hence does not alter the voltage being measured due to circuit loading effects. Final answer: D

Answer Option 8:

The potentiometer method is a null method of measurement i.e., the current through the galvanometer is zero when the balance is achieved. Hence the circuit under test is not disturbed, making it a very accurate method of measurement. Final answer: D

Answer Option 9:

The potentiometer method of DC voltage measurement is more accurate than direct measurement using a voltmeter because it doesn't draw current from the circuit under test, and hence, it does not alter the circuit conditions. Therefore, it does not load the circuit at all. Final answer: D

Question 3:

'Which of these sets of logic gates are designated as universal gates?', A. 'NOR, NAND.', B. 'XOR, NOR, NAND.', C. 'OR, NOT, AND.', D. 'NOR, NAND, XNOR.'

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Answer Option 1:

Universal gates are the ones using which any boolean function can be implemented. Only NOR and NAND gates have this property. Final answer: A

Answer Option 2:

NOR and NAND gates are known as universal gates because, in theory, they can be used to accomplish any possible logical operation. Final Answer: A

Answer Option 3:

A universal gate is a gate which can implement any Boolean function without need to use any other gate type. The NAND and NOR gates are universal gates. Final answer: A

Answer Option 4:

The universal gates are NOR and NAND. They are called universal gates because they can be used to implement any other gates. Final answer: A

Answer Option 5:

Universal gates are the gates that can be used to implement any Boolean function without needing to use any other type of logic gate. The universal gates are the NOR gate and the NAND gate. Final answer: A

Answer Option 6:

NOR and NAND gates are referred to as universal gates since they can be used to create any kind of gate function. Final answer: A

Answer Option 7:

NOR and NAND gates are considered universal gates as they can be used to realize any digital circuit without requiring any other gate. Final answer: A

Answer Option 8:

The universal gates are those which can be used to implement any Boolean function without needing to use any other gate type. The NAND and NOR gates are universal gates. Final answer: A

Answer Option 9:

NOR and NAND gates are considered as universal gates because any boolean function, regardless of complexity, can be implemented by using these two types of gates only. Final answer: A

Question 4:

'A single phase one pulse controlled circuit has a resistance R and counter emf E load $400 \sin(314t)$ as the source voltage. For a load counter emf of 200 V, the range of firing angle control is', A. '30° to 150°.', B. '30° to 180°.', C. '60° to 120°.', D. '60° to 180°.'

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Answer Option 1:

For a single phase one pulse midpoint converter, the control range of firing angle is from 30° to 150° to ensure the output voltage is always lower than the input voltage. Thus, the final answer: A

Answer Option 2:

For a single-phase one pulse controlled circuit, the range of firing angle control is from 30° to 180°. This is because the circuit can be triggered into conduction at any point from the zero crossing (30°) to the peak (180°) of the source voltage. Final answer: B

Answer Option 3:

In a single phase one pulse controlled circuit, the range of firing angle control is between 30° to 180° in order to maintain the output voltage greater than the counter EMF. Final answer: B

Answer Option 4:

The firing angle control for a single phase one pulse converter with resistance R and counter emf E will be from the point where the supply voltage equals the counter emf (200 V in this case) to the point where the supply voltage equals zero. The supply voltage equals 200 V when the sinusoidal waveform is at 30 degrees and 150 degrees. Between these angles the supply voltage is greater than the counter emf and will supply power to the load. The supply voltage equals zero at 180 degrees. So, the range of firing angle control is 30° to 150°. Final answer: A

Answer Option 5:

In a single phase one pulse controlled circuit, the counter emf is given by $E = V_m/2 \cdot \cos(\alpha)$. Here, the peak voltage V_m is the peak of the given sinusoidal voltage, which is 400V. So, $200 = 400/2 \cdot \cos(\alpha)$, or $\cos(\alpha) = 1$. Therefore, $\alpha = 0$ or 180 degrees. But in the practical operation of the circuit, the firing angle α can vary from 30 degrees to 150 degrees. So, the range of the firing angle control for a counter emf of 200V is 30° to 150°. Final answer: A

Answer Option 6:

In single phase one pulse converter, the firing angle lies in between 0° to 180°. But, due to the existence of the load counter emf (E) of 200V, the minimum firing angle at which output voltage becomes zero will be $\cos^{-1}(E/V_m) = \cos^{-1}(200/400) = \cos^{-1}(0.5) = 60^\circ$. So, the range of firing angle control will be from 60° to 180°. Final answer: D

Answer Option 7:

In a single phase one pulse controlled circuit, when the counter emf $E=200V$, the input voltage symbolically represented as $E_m \sin(\omega t)$ must be greater than E for conduction to take place. We can say for conduction $E_m \sin(\omega t) > E$ i.e., $\sin(\omega t) > E/E_m = 200/400 = 1/2$ implying $\omega t > 30^\circ$. Therefore, the firing angle α must be greater than 30°. But as it is a single phase semi converter, it conducts for 180° in a positive half cycle. Therefore, the range of firing angle control is from 30° to 180°. Final answer: B

Answer Option 8:

In this circuit, the firing angle α can be controlled in such a way that the voltage across the load remains constant, even if the load emf changes. If counter emf $E = 200 V$, the rms voltage across the load $= \sqrt{2} \cdot E = \sqrt{2} \cdot 200 = 282.8 V$. But the peak source voltage $= \sqrt{2} \cdot 400 = 565.7 V$. Now, $282.8 / 565.7 = \cos \alpha$. Therefore, $\alpha = \cos^{-1}(282.8 / 565.7) = 60^\circ$. Hence, the range of firing angle control is from 60° to 180° (for a single-phase one-pulse controlled converter). Final answer: D

Answer Option 9:

The range of firing angle control when counter emf (E) is present is given by the formula: $\alpha_{\min} = \sin^{-1}(E/V_m)$ to 180°. Given that $E = 200V$ and $V_m = 400V$ (since $400\sin(314t)$ is the source voltage and the peak value is 400). So, $\alpha_{\min} = \sin^{-1}(200/400) = 30^\circ$. Hence, the range of firing angle control is from 30° to 180°. Final answer: B

Question 5:

'A box which tells the effect of inputs on control sub system is known as', A. 'Data Box.', B. 'Logical box.', C. 'Decision box.', D. 'State box.'

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Answer Option 1:

The correct answer is B. 'Logical box.'

Answer Option 2:

The correct answer is D. 'State box.'

Answer Option 3:

The box which tells the effect of inputs on control sub system is known as a Decision box. Final answer: C

Answer Option 4:

The box which tells the effect of inputs on control sub system is known as 'Decision box.' Final answer: C

Answer Option 5:

A box that tells the effect of inputs on the control subsystem is known as a Decision box. Final answer: C

Answer Option 6:

The box that tells the effect of inputs on a control subsystem is known as a Decision box. Final answer: C

Answer Option 7:

A box which tells the effect of inputs on control sub system is known as a Decision box. Final answer: C

Answer Option 8:

A box which tells the effect of inputs on control sub system is known as a Decision box. Final answer: C

Answer Option 9:

The correct term for a box that describes the effect of inputs on a control subsystem is a "State Box". So the final answer is: D

Question 6:

Two infinite parallel metal plates are charged with equal surface charge density of the same polarity. The electric field in the gap between the plates is', A. 'same as that produced by one plate.', B. 'double the field produced by one plate.', C. 'dependent on coordinates of field points.', D. 'zero.'

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Answer Option 1:

B. 'double the field produced by one plate.'

Answer Option 2:

B. 'double the field produced by one plate.'

Answer Option 3:

The electric field produced by two infinite parallel plates charged with same polarity is double the field produced by one plate. Final answer: B

Answer Option 4:

Since they are of the same polarity, the fields they produce will add up. Therefore, the electric field in the gap between the plates will be double the field produced by one plate. Final answer: B

Answer Option 5:

The electric field produced by each plate will add up in the region between the plates if they have the same charge. Therefore, the electric field in the gap between the plates is double that produced by one plate. Final answer: B

Answer Option 6:

The electric field produced by each plate due to surface charge density of the same polarity will add up in the gap between them. Thus, the electric field in the gap will be double the field produced by one plate. Final answer: B

Answer Option 7:

The electric field produced by one plate is simply the surface charge density divided by the permittivity of free space. If two parallel plates are charged with the same surface charge density and polarity, the fields from the two plates will add in the space between the plates, essentially doubling the field. Final answer: B

Answer Option 8:

The electric field produced by one infinite charged plate is $\sigma/2\epsilon$, where σ is the surface charge density and ϵ is the permittivity of free space. When there are two such plates, the fields add up and the net field is σ/ϵ which is double the field produced by one plate. Final answer: B

Answer Option 9:

The electric field produced by each plate will be directed away from the plate. Since the plates have the same polarity, the fields will be in the same direction in the region between the plates. Therefore, the total electric field between the plates will be the sum of the electric fields produced by each plate, i.e., double the field produced by one plate. Final answer: B

Question 7:

The resistance in the circuit of the moving coil of a dynamometer wattmeter should be, A. 'Low.', B. 'Very low.', C. 'High.', D. 'Almost zero.'

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Answer Option 1:

The resistance in the circuit of the moving coil of a dynamometer wattmeter should be very low. Final answer: B

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Answer Option 2:

The resistance in the circuit of the moving coil of a dynamometer wattmeter should be very low. Final answer: B

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Answer Option 3:

The resistance in the circuit of the moving coil of a dynamometer wattmeter should be very low to avoid significant voltage drop. Final answer: B

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Answer Option 4:

The resistance in the circuit of the moving coil of a dynamometer wattmeter should be high to increase sensitivity and accuracy. Final answer: C

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Answer Option 5:

The resistance in the circuit of the moving coil of a dynamometer wattmeter should be high to reduce the current through it because the moving coil is connected across the voltage terminals. Final answer: C

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Answer Option 6:

The resistance in the circuit of the moving coil of a dynamometer wattmeter should be very low to minimize the power consumption in the coil and to prevent any error due to the coil resistance. Final answer:

B

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Answer Option 7:

The moving coil of a dynamometer wattmeter is connected in series with the load, hence its resistance should be very low in order not to disturb the circuit conditions. Final answer: B

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Answer Option 8:

The resistance in the circuit of the moving coil of a dynamometer wattmeter should be high since it is connected across the voltage terminals in parallel and it should not draw a considerable amount of current. Final answer: C

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Answer Option 9:

The resistance in the circuit of the moving coil of a dynamometer wattmeter should be very low. This is because the moving coil is connected in parallel with the load, and it is desirable to have as little effect on the circuit as possible. Therefore, the high resistance could alter the current it is supposed to measure. Final answer: B

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Question 8:

The following are the necessary requirements of an oscillator, A. 'Amplitude stability', B. 'Frequency stability', C. 'Power stability', D. 'Both A and B'

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Answer Option 1:

Final answer: D

Answer Option 2:

The necessary requirements of an oscillator are amplitude stability and frequency stability. Final answer: D

Answer Option 3:

In an oscillator, both amplitude stability and frequency stability are essential, thus the final answer is: D

Answer Option 4:

Final answer: D

Answer Option 5:

An oscillator needs to maintain a stable frequency at which it oscillates and hence requires frequency stability. Also, it needs to maintain a constant or predictable amplitude level for the signal it produces and hence requires amplitude stability. Final answer: D

Answer Option 6:

The necessary requirements of an oscillator are both amplitude stability and frequency stability. So, the correct answer is D. 'Both A and B'.

Answer Option 7:

An oscillator must have both amplitude and frequency stability. Amplitude stability ensures that the oscillations do not escalate to a non-linear portion of the amplifier characteristic. Frequency stability ensures that the oscillator does not drift from its operating point. Final answer: D

Answer Option 8:

Both amplitude and frequency stability are important for an oscillator. An oscillator should produce a constant output frequency over time, which is frequency stability, and it should also maintain a consistent amplitude, which is amplitude stability.

Final answer: D

Answer Option 9:

An oscillator needs to have both amplitude and frequency stability to ensure a consistent and reliable output. Therefore, the correct answer is D. 'Both A and B'

Question 9:

The normal voltage used in directional heating is', A. '1.5 KV.', B. '15 KV.', C. '33 KV.', D. '66 KV.'

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Answer Option 1:

The normal voltage used in dielectric heating is 15 KV. Final answer: B

Answer Option 2:

The normal voltage used in dielectric heating is 15 KV. Final answer: B

Answer Option 3:

The normal voltage used in directional heating is 33 KV. Final answer: C

Answer Option 4:

The normal voltage used in directional heating is 33 KV. Final answer: C

Answer Option 5:

The normal voltage used in electrical induction heating is 1.5 kV. Final answer: A

Answer Option 6:

The normal voltage used in dielectric heating is 15 KV. Final answer: B

Answer Option 7:

The normal voltage used in dielectric heating is 15 kV. Final answer: B

Answer Option 8:

For high voltage direct heating, a voltage of 33KV is generally used. Final answer: C

Answer Option 9:

Dielectric heating, also known as Radio Frequency heating, uses high-frequency AC electric field to heat non-conducting materials. The usual frequency used in dielectric heating is 13.56 MHz (a wavelength of about 22 meters). The commonly used voltage for this form of heating is 33 KV. Final answer: C

Question 10:

'LC oscillators are used for produce a waveform with frequency ranging from', A. '1MHz to 500 MHz', B. '100 KHz to 500 MHz', C. '1 KHz to 1 MHz', D. '1MHz to 100 GHz'

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Answer Option 1:

LC oscillators are used for frequencies in the range of 1 MHz to 500 MHz. Final answer: A

Answer Option 2:

LC oscillators are typically used for frequencies in the range of 1MHz to 500MHz. Final answer: A

Answer Option 3:

LC oscillators are used for produce a waveform with frequency ranging from 1 MHz to 500 MHz. Final answer: A

Answer Option 4:

LC oscillators are used to produce a waveform with frequency ranging from 1MHz to 500 MHz. Final answer: A

Answer Option 5:

LC oscillators are most commonly used for frequencies in the range from 1 MHz to 500 MHz. Final answer: A

Answer Option 6:

LC oscillators are typically used to generate high frequency sine wave signals where the operating frequency is determined by the tuned LC circuit. The general frequency range for LC oscillators is 1MHz to 500 MHz. Final answer: A

Answer Option 7:

LC oscillators are used to produce a waveform with frequency ranging from 1MHz to 500 MHz. Final answer: A

Answer Option 8:

LC oscillators are used to produce a waveform with frequency ranging from 1MHz to 500 MHz. Final answer: A

Answer Option 9:

LC oscillators are used for producing a waveform with frequency ranging from '1MHz to 500 MHz'. Final answer: A

Question 11:

'A working diode must have', A. 'High resistance when forward or reverse biased', B. 'Low resistance when forward biased, while high resistance when reverse bias', C. 'High resistance when forward biased, while low resistance when reverse bias', D. 'Low resistance when forward or reverse biased'

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Answer Option 1:

A working diode must have low resistance when forward biased, while high resistance when reverse bias. Final answer: B

Answer Option 2:

A working diode must have low resistance when forward biased, while high resistance when reverse bias. Final answer: B

Answer Option 3:

A working diode must have low resistance when forward biased, while high resistance when reverse bias. Final Answer: B.

Answer Option 4:

A working diode must have low resistance when forward biased, while high resistance when reverse bias. Final answer: B

Answer Option 5:

A working diode must have B. 'Low resistance when forward biased, while high resistance when reverse bias'

Answer Option 6:

A working diode should have low resistance when forward biased, while high resistance when reverse biased. Final answer: B

Answer Option 7:

A working diode must have 'Low resistance when forward biased, while high resistance when reverse bias'. Final answer: B

Answer Option 8:

A working diode should have low resistance when forward biased (allowing current to flow easily in the forward direction) and high resistance when reverse biased (preventing current from flowing in the opposite direction). Final answer: B

Answer Option 9:

The correct answer is B. 'Low resistance when forward biased, while high resistance when reverse bias'. In forward bias, the diode has low resistance, allowing current to flow. In reverse bias, the diode has high resistance, preventing current from flowing.

Question 12:

'What is the name of the fluorescent material that gives red colour fluorescence?', A. 'Zinc silicate.', B. 'Calcium silicate.', C. 'Zinc sulphide.', D. 'Magnesium silicate.'

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Answer Option 1:

The fluorescent material that gives red color fluorescence is calcium silicate. Final answer: B

Answer Option 2:

The fluorescent material that gives red color fluorescence is Calcium silicate. Final answer: B

Answer Option 3:

The fluorescent material that gives red color fluorescence is Calcium silicate. Final answer: B

Answer Option 4:

The fluorescent material that gives red color fluorescence is Calcium silicate. Final answer: B

Answer Option 5:

Calcium silicate gives red color fluorescence. Final answer: B

Answer Option 6:

The fluorescent material that gives red color fluorescence is "Calcium silicate". Final answer: B

Answer Option 7:

The fluorescent material that gives red color fluorescence is Calcium Silicate. Final answer: B

Answer Option 8:

Calcium silicate gives red color fluorescence. Final answer: B

Answer Option 9:

The fluorescent material that gives red color fluorescence is Zinc Sulphide. Final answer: C

Question 13:

'How many bits are required to store one BCD digit?', A. '1', B. '2', C. '3', D. '4'

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Answer Option 1:

BCD stands for Binary Coded Decimal. It's a form of numerical representation where each digit is represented by a fixed number of bits, usually four. Final answer: D

Answer Option 2:

A Binary Coded Decimal (BCD) is a binary encoded representation of integer values that uses a 4-bit nibble to encode decimal digits. So, 4 bits are required to store one BCD digit. Final answer: D

Answer Option 3:

BCD (Binary Coded Decimal) is a system of writing numerals that assigns a four-digit binary code to each digit 0 through 9 in a decimal (base-10) numeral. Therefore, 4 bits are required to represent a single BCD digit. Final answer: D

Answer Option 4:

Binary Coded Decimal (BCD) is a way to express each of the decimal digits with a binary code. In the case of the BCD, for each decimal digit we need four bits. Final answer: D

Answer Option 5:

In BCD (Binary Coded Decimal), each digit is represented by a binary number. As there are 10 digits (0-9), 4 bits are required to represent them in binary (0000-1001). Final answer: D

Answer Option 6:

A Binary Coded Decimal (BCD) is a special kind of digital code system which is used to represent decimal digits in binary form. Each decimal digit (0 through 9) is represented by a group of four binary bits. Therefore, to store one BCD digit, 4 bits are required. Final answer: D

Answer Option 7:

BCD stands for binary-coded decimal. Each digit of a decimal number is represented by a four-bit binary number. Therefore, 4 bits are required to store one BCD digit. Final answer: D

Answer Option 8:

BCD stands for Binary Coded Decimal. It is a class of binary encodings of decimal numbers where each decimal digit is represented by a fixed number of bits, usually four. Hence, 4 bits are required to store one BCD digit. Final answer: D

Answer Option 9:

Binary Coded Decimal (BCD) is a way to express each of the decimal digits with a binary code. In the BCD, with four bits we can represent sixteen numbers (from 0 to 15). But in BCD code only first ten of these are used. The remaining six code combinations i.e. 1010 to 1111 are invalid in BCD. Final answer: D

Question 14:

'Commutator in DC generator is used for', A. 'collecting of current', B. 'reduce losses', C. 'increase efficiency', D. 'convert AC armature current in to DC'

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Answer Option 1:

The commutator in a DC generator is specifically used to convert AC armature current into DC. Final answer: D

Answer Option 2:

The commutator in a DC generator is used to convert the AC current generated in the armature into DC current. Final answer: D

Answer Option 3:

The commutator in a DC generator is used for converting the alternating current (AC) generated in the armature windings into direct current (DC). Final answer: D

Answer Option 4:

The commutator in a DC generator is used to convert the alternating current produced in the armature into direct current before it is output from the generator. Final answer: D

Answer Option 5:

The primary function of the commutator in a DC generator is to convert the AC generated in the armature coil into DC before it is drawn out of the generator by the load. Final answer: D

Answer Option 6:

In a DC generator, the commutator's primary function is to convert the alternating current induced in the armature conductors into direct current before it is taken out from the generator. Final answer: D

Answer Option 7:

The main function of the commutator in a DC generator is to convert the AC voltage generated in the armature windings into DC voltage. Final answer: D

Answer Option 8:

The main function of the commutator in a DC generator is to convert the alternating current induced in the armature coils into direct current before it is taken out to the external load. Final answer: D

Answer Option 9:

The main function of commutator in a DC generator is to convert the alternating current induced in the armature conductors into direct current before it is taken out to the external load. Final answer: D

Question 15:

'1 F is theoretically equal to', A. '1 ohm of resistance', B. 'ratio of 1 V to 1 C', C. 'ratio of 1 C to 1 V', D. 'none of these'

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Answer Option 1:

1 Farad is equal to the ratio of 1 Coulomb to 1 Volt. Final answer: C

Answer Option 2:

1 F is theoretically equal to the ratio of 1 C to 1 V. Final answer: C

Answer Option 3:

1 F is theoretically equal to the ratio of 1 C to 1 V. Final answer: C

Answer Option 4:

1 Farad (F) is theoretically equal to the ratio of 1 Coulomb (C) to 1 Volt (V). Final answer: C

Answer Option 5:

1 Farad is the capacitance of a capacitor that, charged with 1 coulomb, gives a potential of 1 volt. So it's the ratio of 1 Coulomb to 1 Volt. Final answer: C

Answer Option 6:

1 F (farad), which is the unit of capacitance, is theoretically equal to the ratio of 1 C (coulomb) to 1 V (volt). Final answer: C

Answer Option 7:

1 F (Farad) is the unit of capacitance. It is defined as the amount of capacitance that will store 1 coulomb of charge with a potential difference of 1 volt. That is, it is the ratio of 1 C (coulomb) to 1 V (volt). Final answer: C

Answer Option 8:

1 F (Farad) is theoretically equal to the ratio of 1 C (coulomb) to 1 V (volt). Final answer: C

Answer Option 9:

1 Farad, the unit of capacitance, is defined as the ratio of the amount of charge (in coulombs) stored in the capacitor to the voltage (in volts) across the capacitor. Hence, 1 F is theoretically equal to the ratio of 1 C to 1 V. Final answer: C

Question 16:

'How many entries will be in the truth table of a 3 input NAND gate?', A. '3', B. '6', C. '8', D. '9'

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Answer Option 1:

A 3-input NAND gate will have $2^3 = 8$ entries in its truth table. Final answer: C

Answer Option 2:

A truth table for a 3-input gate will have $2^3 = 8$ entries. So, the correct answer is C.

Answer Option 3:

A 3-input NAND gate has $2^3 = 8$ possible input combinations. Therefore, the truth table will have 8 entries. Final answer: C

Answer Option 4:

A 3 input NAND gate will have $2^3 = 8$ possible combinations of inputs. Thus, the truth table will have 8 entries. Final answer: C

Answer Option 5:

A 3-input NAND gate has $2^3 = 8$ possible input combinations. Thus, the truth table of a 3-input NAND gate will have 8 entries. Final answer: C

Answer Option 6:

A 3-input NAND gate has $2^3 = 8$ possible combinations of inputs. Therefore, the truth table would also have 8 entries. Final answer: C

Answer Option 7:

In a 3 input NAND gate, there are $2^3 = 8$ possible input combinations. So, the truth table of a 3 input NAND gate will have 8 entries. Final answer: C

Answer Option 8:

For a gate with n inputs, the truth table consists of 2^n entries. Here, $n = 3$ (as it is a 3 input NAND gate). Therefore, the number of entries in the truth table = $2^3 = 8$. Final answer: C

Answer Option 9:

A 3-input NAND gate will have $2^3 = 8$ possible combinations of inputs. So, the truth table will have 8 entries. Final answer: C

Question 17:

'In decimal number system what is MSD', A. 'First digit from left to right', B. 'First digit from right to left', C. 'Middle digit', D. 'Mean of all digits'

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Answer Option 1:

MSD stands for Most Significant Digit. In the decimal number system, MSD is the first digit from left to right. Final answer: A

Answer Option 2:

The MSD (Most Significant Digit) in decimal number system is the first digit from left to right. Final answer: A

Answer Option 3:

The Most Significant Digit (MSD) in the decimal number system is the first digit from left to right. Final answer: A

Answer Option 4:

In the decimal number system, MSD (Most Significant Digit) refers to the first digit from left to right. Final answer: A

Answer Option 5:

The MSD (Most Significant Digit) in a decimal system is the first digit from left to right. Final answer: A

Answer Option 6:

MSD stands for Most Significant Digit. In decimal number system, the MSD is the first digit from left to right. Final answer: A

Answer Option 7:

MSD stands for Most Significant Digit in the decimal number system. It is the first digit from left to right. Final answer: A

Answer Option 8:

MSD stands for Most Significant Digit. In the decimal number system, the MSD is the first digit from left to right. Final answer: A

Answer Option 9:

In the decimal number system, the Most Significant Digit (MSD) is the digit farthest to the left. MSD carries the highest value in a number. Therefore, the final answer is A

Question 18:

'In Digital Logic Designs, GAL is abbreviated as', A. 'General Advance Logic', B. 'General Array Logic', C. 'Generic Advance Logic', D. 'Generic Array Logic'

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Answer Option 1:

GAL stands for Generic Array Logic. Final answer: D

Answer Option 2:

GAL in Digital Logic Designs is abbreviated as Generic Array Logic. Final answer: D

Answer Option 3:

GAL in Digital Logic Designs is abbreviated as Generic Array Logic. Final answer: D

Answer Option 4:

GAL in Digital Logic Designs stands for Generic Array Logic. Final answer: D

Answer Option 5:

GAL in Digital Logic Designs stands for Generic Array Logic. Final answer: D

Answer Option 6:

GAL in Digital Logic Designs stands for Generic Array Logic. Final answer: D

Answer Option 7:

GAL in Digital Logic Designs is abbreviated as 'Generic Array Logic'. Final answer: D

Answer Option 8:

The correct expansion of GAL in the context of digital logic designs is 'Generic Array Logic'. Final answer: D

Answer Option 9:

GAL in Digital Logic Designs is abbreviated as 'Generic Array Logic'. Final answer: D

Question 19:

'Intel 8085A microprocessor ALE signal is made high to', A. 'Enable the data bus to be used as low order address bus', B. 'To latch data D0-D7 from data bus', C. 'To disable data bus', D. 'To achieve all the functions listed above'

=====

Answer Option 1:

The ALE (Address Latch Enable) is made high in Intel 8085A microprocessor to enable the data bus to be used as low order address bus. Final answer: A

Answer Option 2:

The ALE (Address Latch Enable) signal is made high in Intel 8085A microprocessor to enable the data bus to be used as low order address bus. Final answer: A

Answer Option 3:

The ALE (Address Latch Enable) signal is used to demultiplex the address-data signal of port AD7-AD0. When the ALE signal is high, the lower bit address is latched. So, final answer: A

Answer Option 4:

The ALE (Address Latch Enable) signal is used to latch the lower order address so that it can be used to access memory locations. It separates the lower byte of the address from the multiplexed address/data signal. Final answer: A

Answer Option 5:

ALE (Address Latch Enable) is a signal that is used to demultiplex the address-data signal of port. The ALE signal is used to latch the lower order address so that it can be used to decode the memory address signals. Final answer: A

Answer Option 6:

ALE (Address Latch Enable) is an output signal from 8085. ALE is active high signal, it enables or latches the lower order address bus. On the falling edge of ALE the address is latched into the external latch using a 74LS373. Final Answer: A

Answer Option 7:

The ALE (Address Latch Enable) signal is made high to enable the lower order address bus to latch the address data. This is because in 8085 microprocessor, multiplexing is used to accommodate both address and data in the same 8-bit bus. When ALE is high, the address is latched. Final answer: A

Answer Option 8:

ALE stands for Address Latch Enable. In 8085, signals are multiplexed with the address bus to minimize the number of pins. The multiplexed signals are separated using a latch and ALE signal is used to enable this latch. Therefore, ALE signal is made high to enable the data bus to be used as low order address bus. Final answer: A

Answer Option 9:

ALE stands for Address Latch Enable. In an 8085 microprocessor, the address bus is multiplexed with the data bus as well as the control bus. The ALE signal is used for demultiplexing the address and data bus. When ALE is high, the latch is enabled and it will store the data present at its input. Therefore, it is used to enable the data bus to be used as a low order address bus. Final answer: A

Question 20:

'For an SCR gate cathode characteristic is a straight line of 130. For triggered source voltage of 15 V and allowable gate power dissipation of 0.5 W compute the gate source resistance?', A. '111.9 ohm', B. '11.19 ohm', C. '108 ohm', D. '115 ohm'

=====

Answer Option 1:

The required gate source resistance R_{gs} is calculated as, $R_{gs} = V_{gs}/I_g = V_{gs}^2/P_g = [(15)^2]/0.5 = 225/0.5 = 450$ ohm. Final answer: A

Answer Option 2:

$P = V^2 / R$. We can rearrange the equation to $R = V^2 / P$. Substituting the given values, $R = (15)^2 / 0.5 = 225 / 0.5 = 450$ ohm. None of the given options match the calculated value.

Answer Option 3:

Given data: $V_{gt} = 15V$, $P_{gt} = 0.5W$. We know that, $P = V^2 / R$. So, solving for R, we have $R = V^2 / P = (15)^2 / 0.5 = 225 / 0.5 = 450$ Ohms. None of the given options match with the calculated value. There may be a mistake in the question or the options given.

Answer Option 4:

We know that Power dissipation is given as $P = V^2 / R$. We can rearrange this to find resistance, $R = V^2 / P$. Hence, $R = (15)^2 / 0.5 = 225 / 0.5 = 450$ ohms. However, none of the options match this result. It seems that the characteristic straight line of 130 might need to be factored in some way, but without further information, it's unclear how. So, we cannot determine the correct answer from the given options.

Answer Option 5:

Given: $V_{gt} = 15V$, $P_{gt_max} = 0.5W$. The maximum allowed gate current $I_{gt} = P_{gt_max} / V_{gt} = 0.5W / 15V = 33.33mA$. From the straight line characteristic, the SCR gate current is 130 times the gate-cathode voltage. So, the gate-cathode voltage $V_{gk} = I_{gt} / 130 = 33.33mA / 130 = 0.256mA$. The gate-source resistance $R_{gs} = V_{gt} / I_{gt} = 15V / 33.33mA = 450$ ohm. However, this is the total resistance including the internal gate-cathode resistance. Subtracting the internal resistance of 130 ohm gives the external gate-source resistance. $R_{gs_external} = R_{gs_total} - R_{gk} = 450$ ohm - 130 ohm = 320 ohm. None of the given options match the calculated value, so there may be an error in the problem statement or the options provided.

Answer Option 6:

Given data: Gate cathode characteristic = 130, Triggered source voltage, $V_s = 15V$, Allowable gate power dissipation, $P = 0.5W$. We know that Power $P = V^2/R$. Therefore, the gate source resistance $R = V^2/P = (15)^2/0.5 = 225/0.5 = 450$ Ohm. But, the characteristic is a straight line of 130, so we divide the resistance by this factor, $R/130 = 450/130 = 3.46$ Ohm, which is not an option. Therefore, there seems to be a mistake in the question or the options provided.

Answer Option 7:

The gate source resistance can be found using the formula $R_{gs} = V_g/I_g$. Here, V_g is the gate voltage and I_g is the gate current. The gate current can be calculated from the gate power dissipation (P_g) and the gate voltage: $I_g = P_g/V_g = 0.5W/15V = 0.0333A$. Now we can find the gate source resistance: $R_{gs} = V_g/I_g = 15V/0.0333A = 450$ ohm. However, the characteristics of the SCR (a straight line of 130) must be taken into account. The resistance of the SCR itself is $450ohm/130 = 3.46$ ohm. Therefore, the gate source resistance is 450 ohm - 3.46 ohm = 446.54 ohm. None of the given options match with this calculated value.

Answer Option 8:

Given: $V_{gt} = 15V$, $P_{gt} = 0.5W$; Gate cathode characteristics is a straight line passing through origin; hence it is resistive. Power dissipated $P = V*I$, given $P = 0.5W$ and $V = 15V$; therefore, $I_{gt} = P/V = 0.5/15 = 0.03333A$. We know $R = V/I$; substituting the given values we get $R = 15/0.03333 = 449.92$ ohm. But the gate cathode characteristic is a straight line of 130; hence, the total resistance including the internal resistance is 130. Therefore, the source resistance will be $R - 130 = 449.92 - 130 = 319.92$ ohms. However, none of the given options match this result. Thus, the question seems to have incorrect options.

Answer Option 9:

Gate power equals V_g*I_g , where V_g is the trigger voltage and I_g is the gate current. We have $V_g = 15V$ and power = $0.5W$. Hence, $I_g = \text{power} / V_g = 0.5W / 15V = 33.33$ mA. Since gate-cathode characteristic is a straight line, gate current I_g is given by V_g/R_g . Solving the equation for R_g we get $R_g = V_g/I_g = 15V/33.33mA = 449.7$ ohms. But this is the total resistance. We are given that the gate-cathode characteristic is a straight line of 130, which means that 130 ohms is the internal resistance. Thus, the gate source resistance is $R_g - \text{internal resistance} = 449.7$ ohms - 130 ohms = 319.7 ohms. This doesn't match with any of the provided options. The question might be incorrect.

Question 21:

The concept of V/f control of inverters driving induction motors results in', A. 'constant torque operation', B. 'speed reversal', C. 'reduced magnetic loss', D. 'harmonic elimination'

=====

Answer Option 1:

The concept of V/f control of inverters driving induction motors results in A. 'constant torque operation'.

Answer Option 2:

The concept of V/f control of inverters driving induction motors results in A. 'constant torque operation'.

Answer Option 3:

The concept of V/f control of inverters driving induction motors results in 'constant torque operation'. Final answer: A

Answer Option 4:

The concept of V/f control of inverters driving induction motors results in constant torque operation. Final answer: A

Answer Option 5:

The concept of V/f control of inverters driving induction motors results in constant torque operation. Final answer: A

Answer Option 6:

The concept of V/f control of inverters driving induction motors results in constant torque operation. Final answer: A

Answer Option 7:

The concept of V/f control of inverters driving induction motors results in constant torque operation. Final answer: A

Answer Option 8:

The V/f control or constant V/f control of Induction Motor is a method of speed control, where the stator voltage / frequency ratio is kept constant. By doing so, we can achieve a constant flux condition (since flux \propto V/f). This will result in a constant maximum torque operation. Final answer: A

Answer Option 9:

V/f control or Volts per Hertz control is one of the methods used in speed control of induction motor. It basically maintains the ratio of voltage and frequency applied to the motor constant at any speed of operation. This results in constant torque operation. Final answer: A

Question 22:

'The energy stored in the magnetic field in a solenoid 30 cm long and 3 cm diameter wound with 1000 turns of wire carrying a current at 10 amp, is', A. '0.015 joule.', B. '0.15 joule.', C. '0.015 joule.', D. '1.15 joule.'

=====

Answer Option 1:

Energy stored in magnetic field of a solenoid is given by $W = (1/2)LI^2$, where L is the inductance and I is the current. The inductance of a solenoid is given by $L = \mu_0 n^2 A l$, where n is the number of turns per unit length, A is the cross-sectional area, and l is the length. Given that $n=1000/0.3=3333.33$ turns/m, $A=\pi(0.03/2)^2 = 0.000707 \text{ m}^2$, and $l=0.3\text{m}$, we find that $L = 4\pi \cdot 10^{-7} \cdot 3333.33^2 (0.000707) \cdot 0.3 = 0.000884 \text{ H}$. Therefore, $W = (1/2) \cdot 0.000884 \cdot (10)^2 = 0.00442 \text{ Joule}$. None of the given options is correct.

Answer Option 2:

The energy stored in the magnetic field of a solenoid is given by the expression: $W = 0.5 \cdot L \cdot I^2$ Where L is the inductance of the solenoid and I is the current through it. The inductance of a solenoid is given by the expression: $L = (\mu_0 N^2 A) / l$ Where N is the number of turns, A is the cross-sectional area and l is the length. Given that $N=1000$, $A=\pi(0.015)^2$, $l=0.3$, all measured in SI units, and $\mu_0=4\pi \cdot 10^{-7} \text{ H/m}$, we find that L is approximately 0.03 H. Then the energy stored is $W = 0.5 \cdot (0.03 \text{ H}) \cdot (10 \text{ A})^2 = 1.5 \text{ J}$. Final answer: B

Answer Option 3:

The energy stored in a solenoid of inductance L carrying a current I is given by $W = 0.5LI^2$, where $L = \mu_0 (N^2 A / l)$. Here $N = 1000$ turns, $A = \pi(d/2)^2 = \pi(0.03/2)^2 \text{ m}^2$, $L = 0.30 \text{ m}$ and $I = 10 \text{ A}$.

Substituting these values we get $W = 0.5 \cdot [4\pi \cdot 10^{-7} \cdot (1000^2 \cdot 3.14 \cdot (0.015/2)^2 / 0.30)] \cdot (10^2) = 0.015 \text{ Joule}$. Final answer: A

Answer Option 4:

Given data: $L = 30 \text{ cm} = 0.3 \text{ m}$, $d = 3 \text{ cm} = 0.03 \text{ m}$, $N = 1000$ turns, $I = 10 \text{ A}$, and the permeability of free space $\mu_0 = 4\pi \cdot 10^{-7} \text{ H/m}$. The energy stored in a solenoid is given by the formula $W = 0.5LI^2$, where L is the inductance of the solenoid. The inductance L of a solenoid is given by the formula $L = (\mu_0 N^2 A) / l$. The cross-sectional area A of the solenoid is given by the formula $A = \pi(d/2)^2$. Substituting the given values into these formulas, we get $A = \pi(0.015)^2 = 0.0007068 \text{ m}^2$, $L = (4\pi \cdot 10^{-7} \cdot 1000^2 \cdot 0.0007068) / 0.3 = 0.00236 \text{ Henrys}$, and $W = 0.5 \cdot 0.00236 \cdot (10^2) = 0.0118 \text{ Joules} = 0.012 \text{ Joules}$, which is not in the given options. Thus, there seems to be an error either in the question or in the options provided. The closest option would be A, though it is not exactly correct.

Answer Option 5:

The energy stored in a solenoid is given by the formula $W = (1/2)LI^2$. The inductance L of a solenoid is given by $L = \mu_0 (N^2 A) / l$, where N is the number of turns, A is the cross-sectional area of the solenoid, l is the length of the solenoid, and μ_0 is the permeability of free space ($4\pi \cdot 10^{-7}$). Here, $N=1000$ turns, $l=10 \text{ A}$, $l=0.3 \text{ m}$, $A=\pi(r^2) = \pi(0.015^2) \text{ m}^2$. Putting these values in the formula, we get $L = 4\pi \cdot 10^{-7} \cdot (1000^2) \cdot \pi \cdot 0.015^2 / 0.3 = 0.000031416 \text{ N-m/A}$. So, the energy stored is $W = (1/2)LI^2 = 0.5 \cdot 0.000031416 \cdot (10^2) = 0.015708 \text{ joules}$. Final answer: C.

Answer Option 6:

The energy (W) stored in a magnetic field in a solenoid can be calculated using the formula $W = (1/2)LI^2$, where L is the inductance and I is the current. The inductance (L) of a solenoid is given by the formula $L = (\mu_0 \mu_r N^2 A) / l$, where μ_0 is the permeability of free space, μ_r is the relative permeability, N is the number of turns, A is the cross-sectional area and l is the length. For air, μ_r is approximately 1. Substituting these values in the formula for inductance, we get $L = (4\pi \cdot 10^{-7} \cdot 1 \cdot 1000^2 \cdot \pi \cdot (1.5 \cdot 10^{-2})^2) / (30 \cdot 10^{-2}) = 9.42 \cdot 10^{-3} \text{ H}$.

Now, substituting the values of L and I in the formula for energy, we get $W = (1/2) \cdot 9.42 \cdot 10^{-3} \cdot 10^2 = 0.47 \text{ J}$.

None of the given options match with the calculated energy. It seems there's a mistake in the question or the options provided.

Answer Option 7:

The energy stored in the magnetic field in a solenoid can be calculated using the formula: $\text{Energy} = 1/2 \cdot L \cdot I^2$, where L is the inductance and I is the current. The inductance of a solenoid is given by $L = \mu_0 \cdot N^2 \cdot A / l$, where N is the number of turns, A is the cross-sectional area, l is the length, and μ_0 is the permeability of free space.

First, calculate the cross-sectional area $A = \pi \cdot (d/2)^2 = \pi \cdot (0.03\text{m} / 2)^2 = 7.07 \cdot 10^{-4} \text{ m}^2$.

Then, calculate the inductance $L = (4\pi \cdot 10^{-7} \text{ T}\cdot\text{m/A}) \cdot (1000 \text{ turns})^2 \cdot (7.07 \cdot 10^{-4} \text{ m}^2) / 0.3\text{m} = 2.36 \cdot 10^{-3} \text{ H}$.

Finally, calculate the energy stored: $\text{Energy} = 1/2 \cdot L \cdot I^2 = 1/2 \cdot 2.36 \cdot 10^{-3} \text{ H} \cdot (10 \text{ A})^2 = 0.118 \text{ Joule}$

None of the options given exactly match the calculation. The answer is closest to option B. So, the final answer is B. '0.15 joule.'

Answer Option 8:

The energy stored in a solenoid is given by the formula $W = \frac{1}{2} LI^2$. Where L is the inductance of the solenoid. The inductance of a solenoid is given by the formula $L = \mu \cdot n^2 A l$. Where n is the number of turns per unit length, A is the cross-sectional area of the solenoid and l is the length of the solenoid. Here, $n = 1000/0.3 = 3333.33$ turns/m, $A = \pi(0.03/2)^2 = 0.000707 \text{ m}^2$ and $l = 0.3 \text{ m}$. So, $L = (4\pi \cdot 10^{-7})(3333.33)^2(0.000707)(0.3) = 0.09855 \text{ H}$. Hence, $W = \frac{1}{2}(0.09855)(10)^2 = 4.9275 \text{ J}$. However, none of the given options match the calculated answer.

Answer Option 9:

The energy stored in a magnetic field of a solenoid is given by formula $W = (1/2)LI^2$. Where L is the inductance of the solenoid, which is given by formula $L = (\mu_0 n^2 A) / l$, where n is turns per unit length, A is cross-sectional area and l is length of solenoid: $\mu_0 = 4\pi \cdot 10^{-7} \text{ H/m}$, $n = 1000/0.3 = 3333.33$ turns/m, $A = \pi(0.015)^2 \text{ m}^2$, $l = 0.3 \text{ m}$. So, $L = (4\pi \cdot 10^{-7} \cdot (3333.33)^2 \cdot \pi(0.015)^2) / 0.3 = 0.000707 \text{ H}$. Using this value in formula for W, $W = (1/2) \cdot 0.000707 \cdot (10)^2 = 0.03535 \text{ Joules}$. There seems to be a mistake in the provided options, as none of them match the calculated answer.

Question 23:

'While operating on variable frequency supplies, the AC motor requires variable voltage in order to', A. 'protect the insulation.', B. 'avoid effect of saturation.', C. 'improve the capabilities of the inverter.', D. 'protect thyristor from dV / dt .'

=====

Answer Option 1:

A. 'protect the insulation.'

Answer Option 2:

A. 'protect the insulation.'

Answer Option 3:

A. 'protect the insulation.'

Answer Option 4:

A. 'protect the insulation.'

Answer Option 5:

A. 'protect the insulation.'

Answer Option 6:

The AC motor requires variable voltage in order to protect the insulation. Final answer: A

Answer Option 7:

The statement is true because in order to keep the magnetic flux constant within the motor, a variable voltage is required when operating on variable frequency supplies. Final answer: A

Answer Option 8:

The voltage of an AC motor is varied in correspondence with the frequency to maintain the V/F ratio constant. This helps in maintaining the magnetic saturation in the motor core at an optimal level, avoiding a high magnetic flux density which could lead to saturation. Final answer: B

Answer Option 9:

A variable frequency supply to a motor means its speed is being controlled. But to avoid a disproportionate increase in current which could lead to excessive heat development and might damage the motor, it is necessary to maintain the voltage/frequency (V/f) ratio constant. So, as the frequency is varied, the voltage is also varied proportionately to protect the insulation. Final answer: A

Question 24:

'Which of the following windings are necessary in case of all dc machines?', A. 'closed winding', B. 'lap winding', C. 'wave winding', D. 'open type winding'

=====

Answer Option 1:

In case of all DC machines, there has to be a closed path for the current to flow and hence, a closed winding is necessary. Final Answer: A

Answer Option 2:

In all dc machines, a closed winding is necessary to ensure the flow of current. Final answer: A

Answer Option 3:

In all types of DC machines, armature winding is a closed winding. This is necessary to create a continuous path for current flow. Final answer: A

Answer Option 4:

In all DC machines, the armature winding is always a closed winding. Final answer: A.

Answer Option 5:

The closed winding is necessary in all DC machines. This is because the close winding provides the necessary magnetic field and maintains continuity in the operation of the machine. Final answer: A

Answer Option 6:

In DC machines, both Lap winding and Wave winding are used. However, the winding must always be closed for current to flow. Therefore, the correct final answer is: A

Answer Option 7:

In all DC machines, the armature windings are closed windings. This is because a closed winding implies a continuous and closed path for the current to flow, which is essential for the operation of any electrical machine. Final answer: A

Answer Option 8:

The armature winding of a DC machine is a closed winding. This is necessary to ensure the circulating current and to produce torque continuously and uniformly. Final answer: A

Answer Option 9:

In all DC machines, a closed winding is necessary because the current has to flow through an external circuit and then return to the source. Therefore, the correct answer is "closed winding". Final answer: A

Question 25:

'Relaxation Voltage controlled oscillators are used to generate', A. 'Sinusoidal wave', B. 'Triangular wave', C. 'Sawtooth wave', D. 'Both B and C'

=====

Answer Option 1:

Relaxation Voltage controlled oscillators are used to generate both triangular and sawtooth waves. Final answer: D

Answer Option 2:

Relaxation oscillators are used to generate non-sinusoidal outputs such as a sawtooth or triangular waveforms. Final answer: D

Answer Option 3:

Relaxation oscillators are often used to produce low-frequency signals such as triangle waveforms and sawtooth waveforms, rather than sinusoidal waves. Final answer: D

Answer Option 4:

Relaxation Voltage controlled oscillators are used to generate 'Both B and C' i.e., Triangular wave and Sawtooth wave. So, the final answer is D.

Answer Option 5:

Relaxation Voltage Controlled Oscillators are generally used to generate waveforms of low frequency like square waves, triangular waves, and sawtooth waves. Final answer: D

Answer Option 6:

Relaxation oscillators are used to generate non-sinusoidal waveforms, such as square, sawtooth and triangular waveforms. Final answer: D

Answer Option 7:

Relaxation oscillators are commonly used to generate non-sinusoidal waveforms such as square, triangular and sawtooth waves. Final answer: D

Answer Option 8:

Relaxation oscillators are typically used to produce non-sinusoidal waveforms, such as square, triangular, and sawtooth waves. Final answer: D

Answer Option 9:

Relaxation oscillators are typically used to produce sawtooth or triangle waves. They work by charging a capacitor and then suddenly discharging it after it reaches a certain threshold voltage. Final answer: D

Question 26:

The supply frequency usually employed for high frequency eddy current heating is', A. '1 KHz.', B. '5 KHz.', C. '10 MHz.', D. '10 KHz to 400 KHz.'

=====

Answer Option 1:

High frequency eddy current heating is typically done at a frequency range of 10 KHz to 400 KHz. Final answer: D

Answer Option 2:

The high frequency eddy current heating typically employs a supply frequency in the range of 10 KHz to 400 KHz. Final answer: D

Answer Option 3:

High frequency eddy current heating is usually done at frequencies ranging from 10 KHz to 400 KHz. Final answer: D

Answer Option 4:

High frequency eddy current heating is usually achieved with supply frequencies ranging from 10 kHz to 400 kHz. Final answer: D

Answer Option 5:

High frequency eddy current heating is usually done using frequencies in the range 10 KHz to 400 KHz. Final answer: D

Answer Option 6:

High frequency eddy current heating typically employs a supply frequency in the range of 10 KHz to 400 KHz. Final answer: D

Answer Option 7:

High frequency eddy current heating is typically achieved at frequencies in the range of 10 KHz to 400 KHz. Final answer: D

Answer Option 8:

For high-frequency eddy current heating, the supply frequency is usually in the range of 10 KHz to 400 KHz. Final answer: D

Answer Option 9:

High frequency eddy current heating is typically used for applications such as surface hardening, annealing, tempering, and so on. For these applications, frequencies ranging from 10 KHz to 400 KHz are generally used. Final answer: D

Question 27:

'In the toggle mode a JK flip-flop has', A. 'J = 0, K = 0.', B. 'J = 1, K = 1.', C. 'J = 0, K = 1.', D. 'J = 1, K = 0.'

=====

Answer Option 1:

In the toggle mode of a JK flip-flop, both J and K inputs are set to 1. Final answer: B

Answer Option 2:

In the toggle mode a JK flip-flop has J = 1, K = 1. Final answer: B

Answer Option 3:

In the toggle mode of a JK flip-flop, both J and K inputs are set to 1. Final answer: B

Answer Option 4:

In a JK flip-flop, the Toggle mode occurs when J=1 and K=1. The output Q toggles irrespective of its previous state. Final answer: B

Answer Option 5:

In the toggle mode of a JK flip-flop, both J and K inputs are set to 1. This causes the output to toggle between 0 and 1 with each clock pulse. Final answer: B

Answer Option 6:

In a JK flip-flop, when J and K are both high (i.e., 1), the state will toggle. Final answer: B

Answer Option 7:

In the toggle mode, the flip-flop changes state. This occurs when both inputs J and K are set to 1. Final answer: B.

Answer Option 8:

In the toggle mode, a JK flip-flop has J=1, K=1. This mode is utilized when we want to alter the state of the flip-flop from 'set' to 'reset' or vice versa each time a clock pulse arrives. Final answer: B

Answer Option 9:

In toggle mode of JK flip flop, J = K = 1. This mode is also known as toggle mode because, in this mode, the flip flop toggles its output Q for every positive edge of the clock if J = K = 1. Final answer: B

Question 28:

'Electric drive is becoming more and more popular because', A. 'all of below.', B. 'it provide smooth and easy control.', C. 'it is cheaper in cost.', D. 'it is simple and reliable.'

=====

Answer Option 1:

Final answer: A

Answer Option 2:

Final answer: A

Answer Option 3:

Final answer: A

Answer Option 4:

Electric drive has many advantages including easy control, reliability, and cost-effectiveness. Final answer: A

Answer Option 5:

Electric drives are becoming increasingly popular because they provide smooth and easy control, they are relatively low cost, and they are simple and reliable. Final answer: A

Answer Option 6:

Electric drive is becoming more and more popular because it provides smooth and easy control, it is cheaper in cost and it is simple and reliable. Final answer: A

Answer Option 7:

Electric drive is becoming more popular due to a combination of factors like its simplicity, reliability, cost-effectiveness, and the ease and smoothness of control it provides. Final answer: A

Answer Option 8:

Electric drive is becoming more and more popular because it provides smooth and easy control, it is cheaper in cost, and it is simple and reliable. So, the final answer is: A. 'all of below.'

Answer Option 9:

Electric drive is becoming more popular due to a number of reasons. These include its simplicity and reliability, its cost-effectiveness, and its ability to provide smooth and easy control. Therefore, all of the options provided are correct. Final answer: A

Question 29:

'A step up chopper has input voltage 110 V and output voltage 150 V. The value of duty cycle is', A. '0.32.', B. '0.67.', C. '0.45.', D. '0.27.'

=====

Answer Option 1:

In step-up chopper, the output voltage is greater than the input voltage. The output voltage V_0 is given by the relation $V_0 = V_{in}/(1-D)$, where D is the duty cycle. So, rearranging for D gives $D = 1 - (V_{in}/V_0) = 1 - (110/150) = 0.27$. Final answer: D

Answer Option 2:

The output voltage of a step-up chopper is given by the formula, $V_0 = V_d / (1 - D)$, where V_d is the input voltage and D is the duty cycle. Re-arranging this gives $D = 1 - (V_d / V_0) = 1 - (110 / 150) = 0.27$. Final answer: D

Answer Option 3:

The output voltage V_0 of a step-up chopper is given by $V_0 = V/(1-T)$, where V is the input voltage, and T is the duty cycle.

Rearranging for T gives $T = 1 - (V/V_0) = 1 - (110/150) = 0.27$. Final answer: D

Answer Option 4:

The output voltage for a step-up chopper is given by $V_o = V_i/(1 - D)$, where D is the duty cycle, V_i is the input voltage, and V_o is the output voltage. We can rearrange to find $D = 1 - (V_i/V_o)$.

Substituting the given values we get $D = 1 - (110/150) = 0.27$. Final answer: D.

Answer Option 5:

In a step-up chopper, the output voltage is higher than the input voltage. The relationship between the input (V_{in}) and output voltage (V_{out}) in terms of duty cycle (D) can be expressed as, $V_{out} = V_{in} / (1-D)$.

We can solve for D : $D = 1 - (V_{in}/V_{out}) = 1 - (110/150) = 0.27$. Final answer: D

Answer Option 6:

In a step-up chopper, the output voltage is given by, $V_o = V_s/(1 - D)$. Where V_s = Supply voltage, D = Duty cycle and V_o = Output voltage. The duty cycle, $D = 1 - (V_s/V_o) = 1 - (110/150) = 0.27$. Final answer: D

Answer Option 7:

The output voltage V_o of a step up chopper is given by $V_o = V/(1-D)$, where V is the input voltage and D is the duty cycle. So, $150 = 110/(1-D)$, which means $D = 1 - (110/150) = 0.27$. Final answer: D

Answer Option 8:

In the case of a step up chopper, the output voltage is related to the input voltage and duty cycle through the following relationship: $V_{out} = V_{in} / (1-D)$. Rearranging for D gives $D = 1 - (V_{in}/V_{out}) = 1 - (110/150) = 0.27$. Final answer: D

Answer Option 9:

The output voltage V_o for a step-up chopper is given by the equation $V_o = V_{in}/(1-D)$ where D is the duty cycle.

So, we can rearrange the equation to find D : $D = 1 - (V_{in}/V_o)$

Substitute in the given values: $D = 1 - (110/150) = 0.27$.

Final answer: D

Question 30:

'A Binary number system has how many digits.', A. '0', B. '1', C. '2', D. '10'

=====

Answer Option 1:

The binary number system uses only two digits: 0 and 1. Final answer: C

Answer Option 2:

A binary number system has 2 digits. Final answer: C

Answer Option 3:

A Binary number system has 2 digits. Final answer: C

Answer Option 4:

A binary number system has 2 digits. Final answer: C

Answer Option 5:

A binary number system has 2 digits (0 and 1). Final answer: C

Answer Option 6:

The binary number system has 2 digits: 0 and 1. Final answer: C

Answer Option 7:

The binary number system, also known as base 2, has two digits: 0 and 1. Final answer: C

Answer Option 8:

The binary number system, also known as the base-2 number system, has only two digits: 0 and 1. Final answer: C

Answer Option 9:

The binary number system, also known as the base-2 number system, has only two digits: 0 and 1. Final answer: C

Question 31:

'Lowest critical frequency is due to pole and it may be present at the origin or nearer to the origin, then the type of network is', A. 'LC.', B. 'RL.', C. 'RC.', D. 'Any of the above.'

=====

Answer Option 1:

The lowest critical frequency is found in a RC network. Final answer: C

Answer Option 2:

The type of network is C. 'RC.'

Answer Option 3:

In the case of an LC network, the lowest critical frequency is due to a pole and it may be present at the origin or nearer to the origin. Final answer: A

Answer Option 4:

The lowest critical frequency is due to a pole and is present at the origin or near the origin in an RC network. Final answer: C

Answer Option 5:

In RC (Resistance-Capacitance) only, the pole or lowest critical frequency can be present at the origin or nearer to it. So, the final answer is: C

Answer Option 6:

The lowest critical frequency is due to a pole, and if it is present at the origin or closer to the origin, then it is an RC (Resistor-Capacitor) network. Final answer: C

Answer Option 7:

The lowest critical frequency is due to pole and it may be present at the origin or nearer to the origin, then the type of network is RC. Final answer: C

Answer Option 8:

In the RC (resistive-capacitive) network, the lowest critical frequency is due to pole and it may be present at the origin or nearer to the origin. Final answer: C

Answer Option 9:

The lowest critical frequency in a network is due to a pole at the origin or near the origin. This is characteristic of RC (Resistor-Capacitor) networks, where the pole is at the origin and the critical frequency responds to changes in capacitance and resistance. Final answer: C

Question 32:

'Advantages of open loop control system is/are', A. 'simple and economical.', B. 'accurate.', C. 'reliable.', D. 'all of the above.'

=====

Answer Option 1:

Final answer: A

=====

Answer Option 2:

Open loop systems are generally simple and economical because they don't require feedback to operate. Final answer: A

=====

Answer Option 3:

Open loop control system is simple and economical but it's not accurate or reliable compared to closed loop systems. Final answer: A

=====

Answer Option 4:

Final answer: A. Open loop control systems are generally simple and economical. They are not necessarily accurate or reliable as there is no feedback to correct errors. Accuracy and reliability are the advantages of closed loop systems.

=====

Answer Option 5:

Open loop systems are generally simple and economical. They are easier to construct and maintain. But they are not necessarily accurate or reliable as they do not correct any errors that may occur. So, the final answer is: A

=====

Answer Option 6:

Open-loop control systems are generally simple, economical, and easy to maintain. However, they lack accuracy and are not always reliable since they do not automatically correct any errors that might occur. Therefore, the correct answer is A. 'simple and economical.'

=====

Answer Option 7:

An open-loop control system is indeed simple and economical. It is also reliable because it doesn't rely on feedback. However, it is not always accurate since any changes or disturbances in the system can lead to errors. Final answer: A

=====

Answer Option 8:

The advantages of an open-loop control system include that it is simple in construction and design, cost-effective or economical, and relatively more reliable and stable as compared to a closed-loop system because it doesn't bother with the output condition. It just gives the command to the system and does not try to compare the output with the reference input. Final answer: A

=====

Answer Option 9:

Open loop control systems are typically simple, economical and reliable. They are not always accurate because they don't have any mechanism to self correct any errors that might occur. So, the answer is A. 'simple and economical.' and C. 'reliable.'. But since we have to choose one answer, final answer is D. 'all of the above.' as it encompasses both A and C.

=====

Question 33:

The voltage induced in an inductor is represented as;', A. 'product of its inductance and current through it.', B. 'ratio of its inductance to current through it.', C. 'ratio of current through it to its inductance.', D. 'product of its inductance and rate of change of current through it.'

=====

Answer Option 1:

The voltage induced in an inductor is represented as the product of its inductance and rate of change of current through it. Final answer: D

Answer Option 2:

The voltage induced in an inductor is represented as the product of its inductance and rate of change of current through it. Final answer: D

Answer Option 3:

The voltage induced in an inductor is represented as the product of its inductance and rate of change of current through it. Final answer: D

Answer Option 4:

The voltage induced in an inductor is represented as the product of its inductance and the rate of change of current through it. Final answer: D

Answer Option 5:

The voltage induced in an inductor is given by the product of its inductance and the rate of change of current through it. This is as per Faraday's Law of electromagnetic induction. Final answer: D

Answer Option 6:

The voltage induced in an inductor is represented as the product of its inductance and the rate of change of current through it. Hence, the final answer is D.

Answer Option 7:

The voltage induced in an inductor is represented as the 'product of its inductance and rate of change of current through it.' This is stated by Faraday's law of electromagnetic induction. Hence, the final answer is: D

Answer Option 8:

The voltage induced in an inductor is represented as the product of its inductance and the rate of change of current through it. Final answer: D

Answer Option 9:

The voltage induced in an inductor is given by Faraday's law of electromagnetic induction, which states that the induced voltage in a circuit is proportional to the rate of change of the magnetic flux through the circuit. This is represented mathematically as $V = L \cdot (dI/dt)$, where V is the induced voltage, L is the inductance, dI/dt is the rate of change of current. Final answer: D

Question 34:

'If a Hexadecimal number needs to convert to binary. For each hexadecimal digit, there will be how many bits', A. '1', B. '2', C. '4', D. '8'

=====

Answer Option 1:

Each hexadecimal digit is equivalent to 4 binary bits. Final answer: C

=====

Answer Option 2:

Each hexadecimal digit can be represented by 4 bits in binary. Final answer: C

=====

Answer Option 3:

C. '4'

=====

Answer Option 4:

Each hexadecimal digit can be represented by 4 binary bits. Final answer: C

=====

Answer Option 5:

For each hexadecimal digit, there will be 4 bits in its binary representation. Final answer: C

=====

Answer Option 6:

Each hexadecimal digit is represented by 4 binary bits. Final answer: C

=====

Answer Option 7:

For every hexadecimal digit, there will be 4 binary bits. Final answer: C

=====

Answer Option 8:

In hexadecimal to binary conversion, each hexadecimal digit represents four binary bits. Final answer: C

=====

Answer Option 9:

A hexadecimal number is a number that has 16 possible values ranging from 0-9 and A-F. When we convert a hexadecimal digit to binary, we get four binary bits. So, for each hexadecimal digit, there will be 4 bits. Final answer: C

=====

Question 35:

'Induction heating takes place in', A. 'conducting but non-magnetic materials.', B. 'conducting materials which may be either magnetic or non-magnetic materials.', C. 'insulating materials.', D. 'conducting and magnetic materials.'

=====

Answer Option 1:

Induction heating can take place in any conducting material, regardless of its magnetic properties. Final answer: B

Answer Option 2:

Induction heating can occur in any object which is conductive, not just magnetic materials. Final answer: B

Answer Option 3:

Induction heating is the process of heating an electrically conducting object (usually a metal) by electromagnetic induction, through heat generated in the object by eddy currents. So, it can take place in conducting materials which may be either magnetic or non-magnetic materials. Final answer: B

Answer Option 4:

Induction heating is the process of heating an electrically conducting object (usually a metal) by electromagnetic induction, through heat generated in the object by eddy currents. Therefore, induction heating can occur in conducting materials which may be either magnetic or non-magnetic. Final answer: B

Answer Option 5:

Induction heating can take place in conducting materials which may be either magnetic or non-magnetic materials. This is because it is the electric current that produces the heat, not the magnetic field. Final answer: B

Answer Option 6:

Induction heating can occur in any object that is conductive. This means that it is not exclusive to magnetic materials. Induction heating occurs due to the induced currents (eddy currents) that are generated in the material by a changing magnetic field. Final answer: B

Answer Option 7:

Induction heating is the process of heating an electrically conducting object (usually a metal) by electromagnetic induction, through heat generated in the object by eddy currents. Therefore, the correct answer is B. 'conducting materials which may be either magnetic or non-magnetic materials.'

Answer Option 8:

Induction heating is a process which is used to bond, harden or soften metals or other conductive materials. For many modern manufacturing processes, induction heating offers an attractive combination of speed, consistency and control. Final answer: B

Answer Option 9:

Induction heating is a process which is used to bond, harden or soften metals or other conductive materials. For many modern manufacturing processes, induction heating offers an attractive combination of speed, consistency and control. So, induction heating takes place in conducting materials which may be either magnetic or non-magnetic materials. Final answer: B

Question 36:

'In a lap winding dc machine number of conductors are 100 and number of parallel paths are 10. Find the average pitch', A. '10', B. '100', C. '50', D. '1'

=====

Answer Option 1:

In a DC machine, the average pitch is calculated by the number of conductors divided by the number of parallel paths. So, in this case, it would be $100/10 = 10$. Final answer: A

Answer Option 2:

In a D.C machine, the average pitch is given as $2 \times (\text{total conductors}) / (\text{total parallel paths}) = 2 \times 100/10 = 20$. But this answer 20 is not given in options A, B, C or D. The question might be wrong or the options provided might be wrong.

Answer Option 3:

The average pitch in a lap winding is calculated as: Average pitch = Total number of conductors/Number of parallel paths = $100/10 = 10$. Final answer: A

Answer Option 4:

In case of a DC machine, average pitch for lap winding is calculated as, Average Pitch = Total number of Conductors / No. of Poles. But, since no. of poles is not given in the question, we use Average Pitch = Total number of Conductors / No. of Parallel Paths, $100/10 = 10$. Final answer: A

Answer Option 5:

The average pitch for a lap winding machine can be calculated by the formula: Average Pitch = Total number of Conductors / Number of Poles.

However, in a lap winding DC machine, the number of poles is equal to the number of parallel paths. So, Average Pitch = $100/10 = 10$. Final answer: A

Answer Option 6:

In a lap winding dc machine, the average pitch is equal to the total number of conductors divided by the number of parallel paths. So, average pitch = $100/10 = 10$. Final answer: A

Answer Option 7:

In a lap winding dc machine, the average pitch is numerically equal to the total number of conductors divided by the number of poles. Here, the number of conductors is given as 100 and the number of poles, which is equal to the number of parallel paths, is given as 10. So, the average pitch is $100/10 = 10$. Final answer: A

Answer Option 8:

The average pitch or coil span for a lap winding is given by the formula: $Y_{avg} = (Z/A) + 1$, where Z is the total number of conductors and A is the number of parallel paths. Substituting given values, $Y_{avg} = (100 / 10) + 1 = 11$. But in DC machine pitch is always an even number, so the pitch is approximately 10. Final answer: A

Answer Option 9:

In a lap wound machine, the average pitch is always equal to the total number of conductors divided by the number of poles. But there is no number of poles given, so we cannot calculate average pitch directly. However, in a DC machine, the number of poles is usually equal to the number of parallel paths. So, we can use that to calculate the average pitch. The number of conductors is 100 and the number of poles (or parallel paths) is 10. So, the average pitch would be $100/10 = 10$. Final answer: A

Question 37:

'Magnetic flux has the unit of', A. 'Newton', B. 'Ampere turn', C. 'Weber', D. 'Tesla'

=====

Answer Option 1:

C. 'Weber'

=====

Answer Option 2:

C. 'Weber'

=====

Answer Option 3:

Magnetic flux is measured in "Weber". Final answer: C

=====

Answer Option 4:

Magnetic flux is measured in Weber. Final answer: C

=====

Answer Option 5:

Magnetic flux is measured in Weber. Final answer: C

=====

Answer Option 6:

The unit of magnetic flux is Weber. Final answer: C

=====

Answer Option 7:

Magnetic flux has the unit of Weber. Final answer: C

=====

Answer Option 8:

Magnetic flux is measured in the unit of Weber. Final answer: C

=====

Answer Option 9:

The unit of magnetic flux is Weber. Final answer: C

=====

Question 38:

'In balanced bridge, if the positions of detector and source are interchanged, the bridge will still remain balanced. This can be explained from which theorem', A. 'Reciprocity theorem', B. 'Thevinin's theorem', C. 'Norton's theorem', D. 'Compensation theorem'

=====

Answer Option 1:

A

Answer Option 2:

A. 'Reciprocity theorem'

Answer Option 3:

This can be explained from the Reciprocity theorem. Final answer: A

Answer Option 4:

This can be explained from the Reciprocity theorem. Final answer: A

Answer Option 5:

The concept of interchanging the positions of detector and source while maintaining the balance of the bridge can be explained with the Reciprocity theorem. Final answer: A

Answer Option 6:

The statement that if the positions of the detector and source are interchanged, the bridge will still remain balanced, can be explained from the Reciprocity Theorem. Final answer: A

Answer Option 7:

The phenomenon that the bridge still remains balanced even if the positions of detector and source are interchanged, can be explained using the Reciprocity theorem. Final answer: A

Answer Option 8:

This principle can be explained using the Reciprocity Theorem, which states that the transfer of energy from one part of a linear, bilateral network to another is the same irrespective of the positions of the source and load. Final answer: A

Answer Option 9:

The Reciprocity Theorem states that the ratio of the response to the excitation in a linear, bilateral network remains the same if the positions of the excitation and response are interchanged. Hence, in a balanced bridge, if the positions of the detector and source are interchanged, the bridge will still remain balanced. Final answer: A

Question 39:

'A D-flip-flop is said to be transparent when', A. 'the output is LOW', B. 'the output is HIGH', C. 'the output follows clock', D. 'the output follow input'

=====

Answer Option 1:

A D flip-flop is said to be transparent when the output follows input. Final answer: D

Answer Option 2:

A D-flip-flop is said to be transparent when the output follows input. Final answer: D

Answer Option 3:

A D flip-flop is said to be transparent when the output follows the input while the clock is high. Final answer: D

Answer Option 4:

A D flip-flop is said to be transparent when the output follows the input while the clock is high. Final answer: D

Answer Option 5:

A D flip-flop is said to be transparent when the output follow input. Final answer: D

Answer Option 6:

A D-flip-flop is said to be transparent when the output follows input. Final answer: D

Answer Option 7:

The D Flip-Flop is said to be in transparent state when the output follows the input, i.e., the output is same as the input. Final answer: D

Answer Option 8:

A D flip-flop is known as "transparent" when the output follows the input, meaning that the output changes as soon as the input changes without waiting for a clock pulse. Final answer: D

Answer Option 9:

A D-flip-flop is said to be transparent when the output follows the input, i.e., during a certain level of the clock pulse, the D input goes directly to the output. Final answer: D

Question 40:

'A Lissajous pattern on an oscilloscope has 5 horizontal tangencies and 2 vertical tangencies. The frequency of horizontal input is 100 Hz. The frequency of the vertical will be', A. '500 Hz.', B. '250 Hz.', C. '400 Hz.', D. '625 Hz.'

=====

Answer Option 1:

The frequency of the vertical input is obtained by multiplying the frequency of the horizontal input by the ratio of the number of horizontal tangencies to the number of vertical tangencies. So, the frequency of the vertical input = $100 \text{ Hz} \times (5/2) = 250 \text{ Hz}$. Final answer: B

=====

Answer Option 2:

The frequency of the vertical input will be the ratio of the number of vertical tangencies to the number of horizontal tangencies, multiplied by the frequency of the horizontal input. This gives $(5/2) \times 100 = 250 \text{ Hz}$. Final answer: B

=====

Answer Option 3:

The Lissajous pattern on an oscilloscope shows the ratio of frequencies of the two signals. The number of tangencies to the horizontal axis is equal to the frequency of the horizontal signal and the number of vertical tangencies is equal to the frequency of the vertical signal. Hence, the frequency of the vertical is $(5/2) \times 100 = 250 \text{ Hz}$. Final answer: B

=====

Answer Option 4:

The number of horizontal tangencies gives the frequency of the vertical signal and the number of vertical tangencies gives the frequency of the horizontal signal. So, if there are 5 horizontal tangencies and 2 vertical tangencies, then the frequency of the vertical input signal is $5/2 = 2.5$ times the frequency of the horizontal signal. Therefore, the frequency of the vertical signal = $2.5 \times 100 \text{ Hz} = 250 \text{ Hz}$. Final answer: B

=====

Answer Option 5:

Lissajous patterns are used to determine the frequency of a waveform from an unknown source in relation to a waveform from a known source. The number of intersections of the two waveforms is indicative of the frequency. In this case, the horizontal tangencies (the intersections) are 5, the vertical tangencies are 2 and the frequency of the horizontal input is 100 Hz. The ratio of the two frequencies is then 5:2.

Therefore, the frequency of the vertical input will be $2 \times 100 = 200 \text{ Hz}$. However, none of the given options matches this exact value.

Please recheck your question, as the provided options do not contain the correct answer based on the standard interpretation of the question.

=====

Answer Option 6:

The number of horizontal tangencies is the ratio of the frequencies of vertical to horizontal input. So if the frequency of the horizontal input is 100Hz and there are 5 horizontal tangencies, the frequency of the vertical input will be $5 \times 100 = 500 \text{ Hz}$. Final answer: A

=====

Answer Option 7:

Lissajous patterns are used to determine the frequency of a waveform from an unknown source as compared to the frequency of a waveform from a known source. In this case, the number of horizontal tangencies corresponds to the frequency ratio. So, the vertical frequency is $5 \times 100 \text{ Hz} = 500 \text{ Hz}$. Final answer: A

=====

Answer Option 8:

The frequency of the vertical input is calculated by taking the ratio of the number of horizontal tangencies to the number of vertical tangencies, and multiplying it by the frequency of the horizontal input.

Therefore, the frequency of the vertical input = $(5/2) \times 100 \text{ Hz} = 250 \text{ Hz}$. Final answer: B

=====

Answer Option 9:

In a Lissajous pattern, the ratio of the frequencies is the ratio of the number of horizontal tangencies to the number of vertical tangencies. So, the vertical frequency is $(5/2) \times 100 \text{ Hz} = 250 \text{ Hz}$. Final answer: B

=====

Question 41:

'Speed control by variation of field flux results in', A. 'constant power drive.', B. 'constant torque drive.', C. 'variable power drive.', D. 'none of the above.'

=====

Answer Option 1:

Speed control by variation of field flux results in constant torque drive. Final answer: B

Answer Option 2:

Speed control by variation of field flux results in constant torque drive. Final answer: B

Answer Option 3:

Speed control by variation of field flux results in constant torque drive. Final answer: B

Answer Option 4:

Speed control by variation of field flux results in constant torque drive. Final answer: B

Answer Option 5:

Speed control by variation of field flux results in constant torque drive. Final answer: B

Answer Option 6:

Speed control by variation of field flux results in a constant torque drive. Final answer: B

Answer Option 7:

Speed control by variation of field flux results in a constant torque drive. Therefore, the correct answer is B. 'constant torque drive.'

Answer Option 8:

Speed control by variation of the field flux results in a constant torque drive. Final answer: B

Answer Option 9:

The speed control by variation of field flux results in a constant torque drive. When the field flux is reduced, the speed increases and vice versa, but the torque remains constant. Final answer: B

Question 42:

'Which of the following memories uses one transistor and one capacitor as basic memory unit', A. 'SRAM', B. 'DRAM', C. 'Both SRAM and DRAM', D. 'nan'

=====

Answer Option 1:

B. 'DRAM'

=====

Answer Option 2:

B. 'DRAM'

=====

Answer Option 3:

B. 'DRAM'

=====

Answer Option 4:

The basic memory unit in Dynamic Random Access Memory (DRAM) uses one transistor and one capacitor. Final answer: B

=====

Answer Option 5:

Dynamic Random Access Memory (DRAM) uses one transistor and one capacitor as a basic memory unit. Final answer: B

=====

Answer Option 6:

The correct answer is B. 'DRAM' (Dynamic Random Access Memory) uses one transistor and one capacitor as the basic memory unit.

=====

Answer Option 7:

DRAM (Dynamic Random Access Memory) uses one transistor and one capacitor as a basic memory unit. Final answer: B

=====

Answer Option 8:

DRAM (Dynamic Random Access Memory) uses a pair of transistor and capacitor as a memory cell. Final answer: B

=====

Answer Option 9:

Dynamic Random Access Memory (DRAM) uses one transistor and one capacitor as a basic memory unit. Final answer: B

=====

Question 43:

'What will be the number of lamps, each having 300 lumens, required to obtain an average illuminance of 50 lux on a 4m * 3m rectangular room?', A. '2', B. '4', C. '5', D. '6'

=====

Answer Option 1:

The total lumens required = illuminance * area = 50 * 4 * 3 = 600 lumens

Number of lamps required = total lumens / lumens per lamp = 600 / 300 = 2 lamps.

Final answer: A.

=====

Answer Option 2:

The total light required is given by the illuminance times the area, or (50 lux) * (4m * 3m) = 600 lumens. The number of lamps required is the total light required divided by the light per lamp, or 600 lumens /

300 lumens/lamp = 2 lamps. Final answer: A

=====

Answer Option 3:

The total illumination required is equal to the product of the illuminance and the area of the room. Thus, the total illumination is 50 lux * (4m * 3m) = 600 lumens.

Each lamp provides 300 lumens, so the number of lamps required is 600 lumens / 300 lumens/lamp = 2 lamps.

Final answer: A

=====

Answer Option 4:

The total lumen required is given by Lux = Lumens/Area. Therefore, Lumens required = Lux * Area = 50 * (4*3) = 600 lumens. Given each lamp gives 300 lumens, So the number of lamps required = Total

Lumens / Lumens per lamp = 600 / 300 = 2 lamps. Final answer: A

=====

Answer Option 5:

Illuminance is the total lumens spread out over a certain area. So, the total lumens needed to produce 50 lux over a 4m * 3m area is total_lumens = 50 lux * 4m * 3m = 600 lumens. Each lamp produces 300

lumens, so the number of lamps needed is total_lumens / lumens_per_lamp = 600 / 300 = 2. Final answer: A

=====

Answer Option 6:

Given data: room area = 4 m * 3 m = 12 m^2, Illuminance = 50 lux, Luminous flux of each lamp = 300 lumens. We know that Illuminance = total Luminous flux / area. Hence, total Luminous flux required =

Illuminance * area = 50 lux * 12 m^2 = 600 lumens. Number of lamps required = total Luminous flux required / Luminous flux of each lamp = 600 lumens / 300 lumens = 2. Final answer: A

=====

Answer Option 7:

Given data: Illuminance(E) = 50 lux, Lumens per lamp(P) = 300 lumens, Area(A) = 4m * 3m = 12m².

We know that Lux = Lumens/Area.

So, the total lumens required = E * A = 50 * 12 = 600 lumens.

The number of lamps required = Total lumens/Lumens per lamp = 600/300 = 2.

Final answer: A.

=====

Answer Option 8:

The total lumen output needed can be found by multiplying the desired illuminance (50 lux) by the area of the room (4m*3m = 12 m^2). So, total lumens = 50 lux * 12 m^2 = 600 lumens. Each lamp provides

300 lumens, so the number of lamps needed = 600 lumens / 300 lumens/lamp = 2 lamps. Final answer: A

=====

Answer Option 9:

The total illumination required = illuminance * area = 50 lux * 4m * 3m = 600 lumens. Considering each lamp gives 300 lumens, the number of lamps = Total illumination / illumination per lamp = 600 / 300 = 2

lamps. Final answer: A

=====

Question 44:

'The output of the system has an effect upon the input quantity, then the system is a', A. 'open loop control system.', B. 'closed loop control system.', C. 'either A or B.', D. 'none of the above.'

=====

Answer Option 1:

In a closed loop control system, the output has an effect on the input quantity. This effect is used to automatically control the output. Final answer: B

Answer Option 2:

In a closed loop control system, the output of the system has an effect upon the input quantity. So, the final answer is B. 'closed loop control system.'

Answer Option 3:

In a closed loop control system, the output has an effect on the input quantity in such a manner that the input quantity will adjust itself based on the output generated. Final answer: B

Answer Option 4:

In a closed loop control system, the output has an effect on the input quantity. This feedback from the output to the input is a basic characteristic of closed-loop systems. Final answer: B

Answer Option 5:

In a closed loop control system, the output has an effect on the input quantity in such a manner as to maintain the desired output. Final answer: B

Answer Option 6:

In a closed loop control system, the output has an effect on the input quantity in such a manner that the input quantity will adjust itself based on the output generated. Final answer: B

Answer Option 7:

In a closed loop control system, the output has an effect on the input quantity. This feedback from output to input is a hallmark of a closed loop system. Final answer: B

Answer Option 8:

In a closed-loop control system, the output has an effect on the input quantity in such a manner that the input quantity will adjust itself based on the output generated. Final answer: B

Answer Option 9:

In a closed loop control system, the output of the system has an effect upon the input quantity. This means that the output is fed back to the input for correction. Therefore the correct answer is B. 'closed loop control system.'

Question 45:

'A sinusoidal signal is analog signal, because', A. 'it can have a number of values between the negative and positive peaks', B. 'it is negative for one half cycle', C. 'it is positive for one half cycle', D. 'it has positive as well as negative values'

=====

Answer Option 1:

A sinusoidal signal is analog because it can have an infinite number of values between the negative and positive peaks. Final answer: A

Answer Option 2:

A sinusoidal signal is an analog signal because it can have an infinite number of values between the negative and positive peaks. Final answer: A

Answer Option 3:

A sinusoidal signal is considered an analog signal because it can have an infinite number of values between its negative and positive peaks. Final answer: A

Answer Option 4:

A sinusoidal signal is considered an analog signal because it can have a number of values between the negative and positive peaks. Final answer: A

Answer Option 5:

A sinusoidal signal is an analog signal, because it can have a number of values between the negative and positive peaks. Final answer: A

Answer Option 6:

A sinusoidal signal is an analog signal because it can have an infinite number of values between the negative and positive peaks. Final answer: A

Answer Option 7:

A sinusoidal signal is an analog signal, because it can have an infinite number of values between the negative and positive peaks. Final answer: A

Answer Option 8:

A sinusoidal signal is an analog signal, because it can have a number of values between the negative and positive peaks. Final answer: A.

Answer Option 9:

A sinusoidal signal is considered an analog signal because it can have an infinite number of values between the negative and positive peaks. This means it can represent information with a greater level of precision than a digital signal, which can only have a limited number of discrete values. Final answer: A.

Question 46:

'FM stands for', A. 'frequent modulation.', B. 'frequency modulation.', C. 'frequency moderator.', D. 'frequent moderator.'

=====

Answer Option 1:

Final answer: B

Answer Option 2:

FM stands for frequency modulation. Final answer: B

Answer Option 3:

FM stands for frequency modulation. Final answer: B

Answer Option 4:

FM stands for 'frequency modulation'. Final answer: B

Answer Option 5:

FM stands for 'frequency modulation.' Final answer: B

Answer Option 6:

FM stands for Frequency Modulation. Final answer: B

Answer Option 7:

FM stands for 'frequency modulation.' Final answer: B

Answer Option 8:

FM stands for 'frequency modulation.' Final answer: B

Answer Option 9:

FM stands for 'frequency modulation.' Final answer: B

Question 47:

'Stack is also known as', A. 'FIFO memory', B. 'Flash memory', C. 'LIFO memory', D. 'LiLO memory'

=====

Answer Option 1:

Stack is also known as 'LIFO memory'. Final answer: C

Answer Option 2:

Stack is also known as 'LIFO memory', which stands for Last In First Out. Final answer: C

Answer Option 3:

Stack is also known as 'LIFO memory', which stands for Last In, First Out. So, the final answer is C.

Answer Option 4:

Stack is also known as 'LIFO memory', where LIFO stands for Last In, First Out. Final answer: C

Answer Option 5:

A stack is also known as a LIFO (Last In, First Out) memory. Final answer: C

Answer Option 6:

Stack is also known as 'LIFO memory' because it follows the Last In First Out principle for inserting and removing data. Final answer: C

Answer Option 7:

A stack is also known as "LIFO memory", which stands for Last In First Out. This refers to the way items are both added and removed from a stack. Final answer: C

Answer Option 8:

Stack is also known as 'LIFO memory'. LIFO stands for Last In First Out, which means the last element added to the stack is the first one to be removed. Final answer: C

Answer Option 9:

Stack is also known as 'LIFO memory'. Final answer: C

Question 48:

'In Ward-Leonard system, the lower limit of the speed imposed by', A. 'Field resistance.', B. 'Armature resistance.', C. 'Residual magnetism of the generator.', D. 'None of above.'

=====

Answer Option 1:

The lower limit of the speed in a Ward-Leonard system is imposed by the Residual magnetism of the generator. Final answer: C

Answer Option 2:

The lower limit of the speed in Ward-Leonard system is imposed by the residual magnetism of the generator. Final answer: C

Answer Option 3:

The lower limit of the speed is imposed by the residual magnetism of the generator. Final answer: C

Answer Option 4:

The lower limit of the speed imposed by the residual magnetism of the generator. Final answer: C

Answer Option 5:

In the Ward-Leonard system, the lower limit of the speed is imposed by the residual magnetism of the generator. Final answer: C

Answer Option 6:

The lower limit of the speed in the Ward-Leonard system is imposed by the residual magnetism of the generator. Final answer: C

Answer Option 7:

In a Ward-Leonard system, the lower limit of the speed is imposed by the residual magnetism of the generator. Final answer: C

Answer Option 8:

In the Ward-Leonard system, the lower limit of speed is imposed by residual magnetism of the generator. Final answer: C

Answer Option 9:

In Ward-Leonard system, the lower limit of the speed imposed by the residual magnetism of the generator. Final answer: C

Question 49:

'Colpitts oscillator is also called as', A. 'Tank circuit oscillator', B. 'LC oscillator', C. 'Resonant circuit oscillator', D. 'All of the above'

=====

Answer Option 1:

Final answer: D

Answer Option 2:

Final answer: D

Answer Option 3:

D. 'All of the above'

Answer Option 4:

The Colpitts oscillator is also known as a tank circuit oscillator, LC oscillator, and resonant circuit oscillator. So, the final answer is: D

Answer Option 5:

The Colpitts oscillator can be referred to as all of these names. Final answer: D

Answer Option 6:

Colpitts oscillator is a type of LC oscillator which falls under the category of harmonic oscillators. LC oscillators are also sometimes described as Tank Circuit oscillator as the LC circuit (inductor-capacitor circuit) acts as a resonant circuit, resonating in radio frequency. Final answer: D

Answer Option 7:

Colpitts oscillator is a type of LC oscillator, it has a resonant circuit (tank circuit) comprising of capacitor and inductor connected in parallel. So, it is also called as LC oscillator, resonant circuit oscillator, tank circuit oscillator. Final answer: D

Answer Option 8:

The Colpitts oscillator is a type of oscillator that uses an LC circuit (also known as a resonant circuit, tank circuit, or tuned circuit) to generate an oscillation at a certain frequency. So, all of the above names apply to it. Final answer: D

Answer Option 9:

The Colpitts oscillator is a type of oscillator that uses an LC circuit (also called a resonant circuit, tank circuit, or tuned circuit) to produce an oscillation at a certain frequency. The LC circuit is also called the tank circuit. So, it can be referred to by all the given names. Final answer: D

Question 50:

'An SCR has half cycle surge current rating of 3000 A for 50 Hz supply. One cycle surge current will be', A. '1500 A.', B. '6000 A.', C. '2121.32 A.', D. '4242.64 A.'

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Answer Option 1:

The one cycle surge current rating is roughly 1.414 times the half cycle surge current rating. So, $1.414 \times 3000 = 4242.64$ A. Final answer: D

Answer Option 2:

The One-cycle surge current rating is approximately 1.414 times the half-cycle rating. So, One-cycle surge current rating = 1.414×3000 A = 4242.64 A. Final answer: D.

Answer Option 3:

The one cycle surge current rating of an SCR is $1/\sqrt{2}$ times the half cycle surge current rating. So, one cycle surge current = $3000\text{A} / \sqrt{2} = 2121.32$ A. Final answer: C

Answer Option 4:

One cycle surge current rating is approximately 1.414 times the half cycle surge current rating. So, one cycle surge current = 1.414×3000 A = 4242.64 A. Final answer: D

Answer Option 5:

The one cycle surge current rating is $1/\sqrt{2}$ times the half cycle surge current rating. So, the one cycle surge current = $3000/\sqrt{2} = 2121.32$ A. Final answer: C

Answer Option 6:

The one cycle surge current rating is approximately 1.414 times the half cycle surge current rating. So, the one cycle surge current would be $1.414 \times 3000 = 4242.64$ A. Final answer: D

Answer Option 7:

One cycle surge current rating is $\sqrt{2}$ times the half cycle surge current rating. So, one cycle surge current = $\sqrt{2} \times 3000 = 4242.64$ A. Final answer: D

Answer Option 8:

The one cycle surge current is less than the half cycle surge current and its value is $1/\sqrt{2}$ times the half cycle surge current. Therefore, one cycle surge current = $3000 / \sqrt{2} = 2121.32$ A approximately.

Final answer: C

Answer Option 9:

The one-cycle surge current rating is 1.414 times the half-cycle rating. So, One cycle surge current = $1.414 \times$ half cycle surge current = 1.414×3000 A = 4242.64 A. Final answer: D
