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Junior Engineer Civil Mechanical and Electrical Examination 2023 Paper II

Roll Number	
Candidate Name	
Venue Name	
Exam Date	04/12/2023
Exam Time	9:00 AM - 11:00 AM
Subject	Junior Engineer 2023 Paper II Electrical

Section : **General Engineering Electrical**

Q.1 Which of the following theorems is the dual of Norton's theorem?

- Ans**
- 1. Reciprocity theorem
 - 2. Thevenin's theorem
 - 3. Superposition theorem
 - 4. Maximum power transfer theorem

Question ID : 264330184575
Option 1 ID : 264330723000
Option 2 ID : 264330723003
Option 3 ID : 264330723001
Option 4 ID : 264330723002
Status : **Answered**
Chosen Option : 2

Q.2 In a single-phase series RL circuit, $X_L = 15 \Omega$ and $R = 20 \Omega$. Find the impedance of the circuit.

- Ans**
- 1. 15Ω
 - 2. 25Ω
 - 3. 20Ω
 - 4. 35Ω

Question ID : 264330184587
Option 1 ID : 264330723048
Option 2 ID : 264330723050
Option 3 ID : 264330723049
Option 4 ID : 264330723051
Status : **Answered**
Chosen Option : 2

Q.3 Which field control method for a DC series motor involves shunting a portion of motor current around the series field to reduce the field flux and increase the speed of the motor?

- Ans**
- 1. Tapped field control
 - 2. Rheostatic control method
 - 3. Armature control method
 - 4. Field diverter method

Question ID : 264330184522
Option 1 ID : 264330722790
Option 2 ID : 264330722788
Option 3 ID : 264330722789
Option 4 ID : 264330722791
Status : Answered
Chosen Option : 4

Q.4 In a multi-plate capacitor, there are a total of nine plates in parallel. This arrangement is equivalent to _____ capacitors in parallel.

- Ans**
- 1. eight
 - 2. ten
 - 3. four
 - 4. nine

Question ID : 264330184569
Option 1 ID : 264330722978
Option 2 ID : 264330722976
Option 3 ID : 264330722979
Option 4 ID : 264330722977
Status : Answered
Chosen Option : 1

Q.5 Which component is responsible for generating the time scale or time reference in a Cathode Ray Oscilloscope (CRO)?

- Ans**
- 1. CRT
 - 2. Time-base generator
 - 3. Vertical amplifier
 - 4. Delay line

Question ID : 264330184453
Option 1 ID : 264330722515
Option 2 ID : 264330722514
Option 3 ID : 264330722512
Option 4 ID : 264330722513
Status : Answered
Chosen Option : 2

Q.6 Why are energy-efficient solutions such as LED lighting and programmable thermostats incorporated into commercial electrical installations?

Ans 1.

To reduce electricity consumption and lower operating costs

2. To raise operating costs

3. To improve safety measures

4. To increase electricity consumption

Question ID : 264330184554

Option 1 ID : 264330722919

Option 2 ID : 264330722917

Option 3 ID : 264330722918

Option 4 ID : 264330722916

Status : Answered

Chosen Option : 1

Q.7 Which of the following is NOT an application of a synchronous motor?

Ans 1. Servo drives

2. High speed compressor

3. Dot matrix printer

4. Main line traction

Question ID : 264330184605

Option 1 ID : 264330723120

Option 2 ID : 264330723121

Option 3 ID : 264330723123

Option 4 ID : 264330723122

Status : Answered

Chosen Option : 4

Q.8 Which part of a transistor is heavily doped and emits majority carriers, either electrons or holes?

Ans 1. Collector

2. Base

3. Emitter

4. Base and emitter

Question ID : 264330184563

Option 1 ID : 264330722952

Option 2 ID : 264330722953

Option 3 ID : 264330722954

Option 4 ID : 264330722955

Status : Answered

Chosen Option : 3

Q.9 Which type of transformer uses a ring or doughnut-shaped core material, offering low leakage inductance and high inductance and Q factors?

- Ans**
- 1. Ferrite core transformer
 - 2. Air core transformer
 - 3. Toroidal core transformer
 - 4. Iron core transformer

Question ID : 264330184519
Option 1 ID : 264330722778
Option 2 ID : 264330722776
Option 3 ID : 264330722777
Option 4 ID : 264330722779
Status : Answered
Chosen Option : 3

Q.10 Which component of a commercial electrical installation is responsible for protection against electrical overloads and short circuits?

- Ans**
- 1. Power sockets
 - 2. Electrical panels or switchgear
 - 3. Lighting systems
 - 4. HVAC systems

Question ID : 264330184553
Option 1 ID : 264330722913
Option 2 ID : 264330722914
Option 3 ID : 264330722912
Option 4 ID : 264330722915
Status : Answered
Chosen Option : 2

Q.11 With reference to tenders, which of the following statements is INCORRECT?

- Ans**
- 1. The earnest money is never returned to the unsuccessful contractors after disposal of the tender.
 - 2. Normally, the tender offering the lowest rates is accepted.
 - 3. The sealed tenders are invited publicly through news-papers.
 - 4. Tenders are invited on a tender form prescribed by the purchase department.

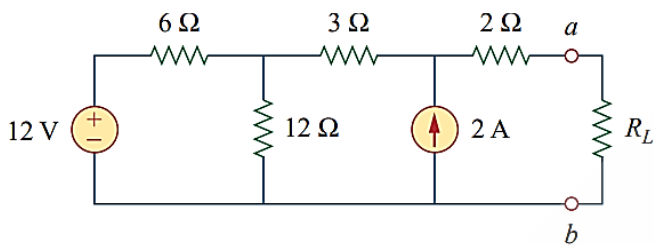
Question ID : 264330184630
Option 1 ID : 264330723222
Option 2 ID : 264330723223
Option 3 ID : 264330723221
Option 4 ID : 264330723220
Status : Answered
Chosen Option : 1

Q.12 Which of the following materials is rarely used as dielectric material in power cables?

- Ans
- 1. Solid
 - 2. Liquid
 - 3. Gases
 - 4. Compound

Question ID : 264330184624
Option 1 ID : 264330723197
Option 2 ID : 264330723198
Option 3 ID : 264330723199
Option 4 ID : 264330723196
Status : Answered
Chosen Option : 3

Q.13 Find the value of Load resistance(R_L) for maximum power transfer in the following circuit.



- Ans
- 1. 22 Ω
 - 2. 11 Ω
 - 3. 33 Ω
 - 4. 9 Ω



Question ID : 264330184577
Option 1 ID : 264330723009
Option 2 ID : 264330723010
Option 3 ID : 264330723008
Option 4 ID : 264330723011
Status : Answered
Chosen Option : 4

Q.14 What is the difference between transmission lines and distribution lines in an electrical power system?

Ans ✓ 1.

Transmission lines carry electricity from generating stations to substations, while distribution lines transport power to end consumers.

✗ 2.

Transmission lines operate at lower voltages than distribution lines.

✗ 3.

Transmission lines use single-phase systems, while distribution lines use three-phase systems.

✗ 4.

Transmission lines have lower current carrying capacity compared to distribution lines.

Question ID : 264330184475

Option 1 ID : 264330722602

Option 2 ID : 264330722603

Option 3 ID : 264330722600

Option 4 ID : 264330722601

Status : Answered

Chosen Option : 1

Q.15 Which type of single-phase motor is known as a 'resistance-start' motor?

Ans ✗ 1. Universal motor

✓ 2. Split-phase motor

✗ 3. Permanent-split capacitor motor

✗ 4. Shaded-pole motor

Question ID : 264330184463

Option 1 ID : 264330722554

Option 2 ID : 264330722552

Option 3 ID : 264330722555

Option 4 ID : 264330722553

Status : Answered

Chosen Option : 2

Q.16 What is the main design criterion for distributors in an electrical power transmission system?

Ans ✗ 1. Frequency

✓ 2. Voltage drop

✗ 3. Current-carrying capacity

✗ 4. Length

Question ID : 264330184549

Option 1 ID : 264330722899

Option 2 ID : 264330722896

Option 3 ID : 264330722897

Option 4 ID : 264330722898

Status : Answered

Chosen Option : 2

Q.17 What will be the self-inductance of the coil if an EMF of 10 V is induced in it when the current flowing through it changes at the rate of 5 A/sec?

- Ans**
- 1. 5 H
 - 2. 2 H
 - 3. 1 H
 - 4. 10 H

Question ID : 264330184580
Option 1 ID : 264330723021
Option 2 ID : 264330723022
Option 3 ID : 264330723023
Option 4 ID : 264330723020
Status : Answered
Chosen Option : 2

Q.18 What is one of the functions of circuit breakers in a substation?

- Ans**
- 1. Voltage regulation
 - 2. Power generation
 - 3. Switching equipment control
 - 4. Interrupting short-circuits and overload currents

Question ID : 264330184540
Option 1 ID : 264330722860
Option 2 ID : 264330722862
Option 3 ID : 264330722863
Option 4 ID : 264330722861
Status : Answered
Chosen Option : 4

Q.19 What is the result of the diffusion of electrons and holes when p-type and n-type semiconductor materials are joined to form a diode junction?

- Ans**
- 1. Depletion of majority charge carriers in the region near the junction
 - 2. Generation of an electric field that inhibits electron movement
 - 3. Formation of positive ions in the p-type material and negative ions in the n-type material
 - 4. Creation of a layer of holes near the junction in the p-type material

Question ID : 264330184488
Option 1 ID : 264330722654
Option 2 ID : 264330722655
Option 3 ID : 264330722652
Option 4 ID : 264330722653
Status : Answered
Chosen Option : 1

Q.20 Which type of work is done by an autotransformer?

- Ans**
- 1. Phase shifting primary to secondary
 - 2. Isolation between primary to secondary
 - 3. Adjustment of voltage in output side
 - 4. Multiple windings

Question ID : 264330184525
Option 1 ID : 264330722802
Option 2 ID : 264330722800
Option 3 ID : 264330722801
Option 4 ID : 264330722803
Status : Answered
Chosen Option : 3

Q.21 If a current of 2 A flowing through one coil produces flux linkage of 5 Wb-turn in the other coil, then what will be the mutual inductance between the two coils?

- Ans**
- 1. 7.5 H
 - 2. 2.5 H
 - 3. 5 H
 - 4. 10 H

Question ID : 264330184581
Option 1 ID : 264330723025
Option 2 ID : 264330723027
Option 3 ID : 264330723026
Option 4 ID : 264330723024
Status : Answered
Chosen Option : 2

Q.22 If the voltage across a 5 μF capacitor is 24 V at $t = 6$ ms, what is the energy stored in the capacitor at that time?

- Ans**
- 1. 120 mJ
 - 2. 720 mJ
 - 3. 360 μJ
 - 4. 1440 μJ

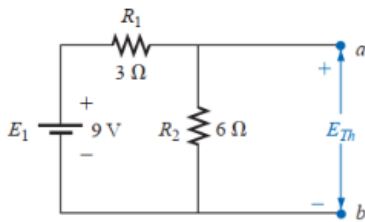
Question ID : 264330184436
Option 1 ID : 264330722444
Option 2 ID : 264330722446
Option 3 ID : 264330722445
Option 4 ID : 264330722447
Status : Answered
Chosen Option : 4

Q.23 In circuit analysis, what is the term used to describe the closed path in a circuit where you start at a point and continue in the same direction, noting the direction of all voltage drops, and return to the same starting point?

- Ans**
- 1. Loop
 - 2. Branch
 - 3. Node
 - 4. Path

Question ID : 264330184494
Option 1 ID : 264330722679
Option 2 ID : 264330722677
Option 3 ID : 264330722676
Option 4 ID : 264330722678
Status : Answered
Chosen Option : 1

Q.24 What is the Thevenin's voltage across the a-b terminal in the given circuit?



- Ans**
- 1. 15 V
 - 2. 6 V
 - 3. 3 V
 - 4. 9 V

Question ID : 264330184439
Option 1 ID : 264330722459
Option 2 ID : 264330722457
Option 3 ID : 264330722456
Option 4 ID : 264330722458
Status : Answered
Chosen Option : 2

Q.25 Usually, the expenditure on supervision charges is _____ of the total cost.

- Ans**
- 1. 5% to 7%
 - 2. 2% to 4%
 - 3. 1% to 1.5%
 - 4. 8% to 10%

Question ID : 264330184629
Option 1 ID : 264330723217
Option 2 ID : 264330723218
Option 3 ID : 264330723219
Option 4 ID : 264330723216
Status : Answered
Chosen Option : 1

Q.26 With reference to 1-phase transformers, match the transformer tests in column A with the purpose of the tests in column B.

Column A	Column B
A. Short circuit test	I. Wattmeter reads the core losses
B. Sumpner's test	II. Wattmeter reads the full load copper losses
C. Open circuit test	III. Determines maximum temperature rise

- Ans**
- ✓ 1. A-II, B-III, C-I
 - ✗ 2. A-III, B-I, C-II
 - ✗ 3. A-II, B-I, C-III
 - ✗ 4. A-I, B-II, C-III

Question ID : 264330184601

Option 1 ID : 264330723106

Option 2 ID : 264330723107

Option 3 ID : 264330723105

Option 4 ID : 264330723104

Status : Answered

Chosen Option : 1

Q.27 What is the primary purpose of control rods in a nuclear reactor?

- Ans**
- ✓ 1. To absorb excess neutrons
 - ✗ 2. To cool the reactor core
 - ✗ 3. To transfer heat to the secondary circuit
 - ✗ 4. To generate electricity



Question ID : 264330184544

Option 1 ID : 264330722877

Option 2 ID : 264330722876

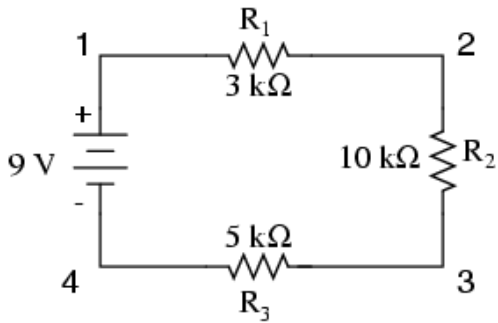
Option 3 ID : 264330722878

Option 4 ID : 264330722879

Status : Answered

Chosen Option : 1

Q.28 Find the voltage across R_3 in the following circuit.



- Ans
- 1. 1.5 V
 - 2. 4.5 V
 - 3. 7.5 V
 - 4. 2.5 V

Question ID : 264330184572

Option 1 ID : 264330722988

Option 2 ID : 264330722990

Option 3 ID : 264330722991

Option 4 ID : 264330722989

Status : Answered

Chosen Option : 4

Q.29 Match the oscillator circuits in column A with their respective characteristics in column B.

Column A	Column B
A. Hartley oscillator	I. Two stage RC coupled amplifier
B. Crystal oscillator	II. LC tuned circuit
C. Wien bridge oscillator	III. Greater stability

- Ans
- 1. A-I, B-III, C-II
 - 2. A-II, B-I, C-III
 - 3. A-II, B-III, C-I
 - 4. A-III, B-I, C-II

Question ID : 264330184593

Option 1 ID : 264330723075

Option 2 ID : 264330723074

Option 3 ID : 264330723072

Option 4 ID : 264330723073

Status : Answered

Chosen Option : 3

Q.30 Which method of electrical heating involves passing electrical energy through a heating element to generate heat, which is then transferred to the substance to be heated?

- Ans**
- 1. Induction heating
 - 2. Direct arc heating
 - 3. Resistance heating
 - 4. Power frequency heating

Question ID : 264330184485
Option 1 ID : 264330722641
Option 2 ID : 264330722642
Option 3 ID : 264330722643
Option 4 ID : 264330722640
Status : Answered
Chosen Option : 3

Q.31 What is the purpose of outgoing feeders in a distribution substation?

- Ans**
- 1. To protect the substation from faults
 - 2. To control the voltage of the substation
 - 3. To carry power from the substation to distribution transformers
 - 4. To generate electrical power

Question ID : 264330184551
Option 1 ID : 264330722905
Option 2 ID : 264330722907
Option 3 ID : 264330722904
Option 4 ID : 264330722906
Status : Answered
Chosen Option : 3

Q.32 Which of the following statements is correct regarding the doping levels of the emitter, base and collector regions in a bipolar junction transistor (BJT)?

- Ans**
- 1. The emitter is moderately doped, the base is heavily doped and the collector is lightly doped.
 - 2. The emitter is lightly doped, the base is heavily doped and the collector is moderately doped.
 - 3. The emitter is heavily doped, the base is lightly doped and the collector is moderately doped.
 - 4. The doping levels of the emitter, base and collector are all the same.

Question ID : 264330184490
Option 1 ID : 264330722662
Option 2 ID : 264330722660
Option 3 ID : 264330722661
Option 4 ID : 264330722663
Status : Answered
Chosen Option : 3

Q.33 What is the purpose of a neutral conductor in a star-connected three-phase system, and how does it help in maintaining balance?

Ans 1.

The neutral conductor is used for overcurrent protection, and it helps in phase separation.

2.

The neutral conductor is used for phase shifting, and it helps in generating higher voltage.

3.

The neutral conductor is used for grounding the system, and it helps in equalising phase voltages.

4.

The neutral conductor is used to increase the voltage between two phases, and it assists in load balancing.

Question ID : 264330184452

Option 1 ID : 264330722511

Option 2 ID : 264330722510

Option 3 ID : 264330722508

Option 4 ID : 264330722509

Status : **Marked For Review**

Chosen Option : 3

Q.34 Which of the following statements is INCORRECT for parallel resonance?

Ans 1. At resonance, the impedance will be maximum.

2.

At resonance, the line current will be in phase with the applied voltage.

3. At resonance, the current will be minimum.

4. At resonance, the power factor will be zero.

Question ID : 264330184589

Option 1 ID : 264330723056

Option 2 ID : 264330723058

Option 3 ID : 264330723057

Option 4 ID : 264330723059

Status : **Answered**

Chosen Option : 4

Q.35 An RLC series circuit has $R = 2 \Omega$, $C = 20 \mu\text{F}$ and the inductance is adjusted such that the voltage across the resistance is maximum. If the applied voltage is 10 V at a frequency of 1000 rad/sec, then find the value of inductance L.

Ans 1. 0.005 H

2. 0.25 H

3. 0.025 H

4. 0.05 H

Question ID : 264330184590

Option 1 ID : 264330723061

Option 2 ID : 264330723062

Option 3 ID : 264330723063

Option 4 ID : 264330723060

Status : **Answered**

Chosen Option : 4

Q.36 What is the function of the 'control system' component in a load drive system?

- Ans
- 1. To convert electrical energy into mechanical energy
 - 2. To measure the temperature of the load
 - 3. To regulate the operation of the load drive
 - 4. To provide electrical power to the load

Question ID : 264330184560
Option 1 ID : 264330722941
Option 2 ID : 264330722943
Option 3 ID : 264330722942
Option 4 ID : 264330722940
Status : Answered
Chosen Option : 3

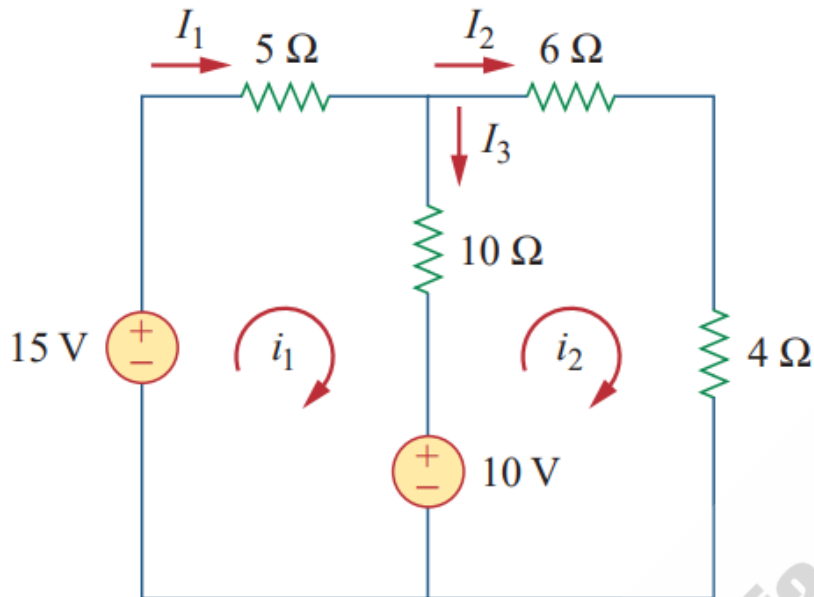
Q.37 Which of the following is a limitation of Millman's theorem?

- Ans
- 1. Applicable if the circuit has only one independent source
 - 2. Applicable if the circuit has no independent sources
 - 3. Applicable if the circuit has no dependent sources
 - 4. Applicable if the circuit has no resistance between the independent sources

Question ID : 264330184499
Option 1 ID : 264330722699
Option 2 ID : 264330722696
Option 3 ID : 264330722698
Option 4 ID : 264330722697
Status : Answered
Chosen Option : 3



Q.38 Find the current I_2 in the following circuit.



- Ans
- 1. 2 A
 - 2. 3 A
 - 3. 4 A
 - 4. 1 A

Question ID : 264330184574
Option 1 ID : 264330722997
Option 2 ID : 264330722998
Option 3 ID : 264330722999
Option 4 ID : 264330722996
Status : Answered
Chosen Option : 4

Q.39 Which type of electromagnetic radiation is primarily used in infrared heating to heat surfaces?

- Ans
- 1. Infrared radiation
 - 2. Microwave radiation
 - 3. X-rays
 - 4. Ultraviolet radiation

Question ID : 264330184557
Option 1 ID : 264330722930
Option 2 ID : 264330722931
Option 3 ID : 264330722929
Option 4 ID : 264330722928
Status : Answered
Chosen Option : 1

Q.40 What is the primary function of the Wind Turbine Generator (WTG) in a wind power system?

- Ans**
- 1. To control the speed of the wind turbine
 - 2. To generate usable electricity from wind energy
 - 3. To store mechanical rotational power
 - 4. To regulate the voltage in the electrical grid

Question ID : 264330184542
Option 1 ID : 264330722869
Option 2 ID : 264330722870
Option 3 ID : 264330722868
Option 4 ID : 264330722871
Status : Answered
Chosen Option : 2

Q.41 The susceptibility of the paramagnetic material is:

- Ans**
- 1. positive and large
 - 2. positive and small
 - 3. negative and small
 - 4. negative and large

Question ID : 264330184507
Option 1 ID : 264330722730
Option 2 ID : 264330722731
Option 3 ID : 264330722729
Option 4 ID : 264330722728
Status : Answered
Chosen Option : 2

Q.42 In a balanced star connection, the ratio of the magnitude of the line voltage to the magnitude of the phase voltage is

- Ans**
- 1. $\sqrt{3}$
 - 2. $\frac{1}{\sqrt{3}}$
 - 3. $\sqrt{2}$
 - 4. $\frac{1}{\sqrt{2}}$

Question ID : 264330184586
Option 1 ID : 264330723045
Option 2 ID : 264330723044
Option 3 ID : 264330723047
Option 4 ID : 264330723046
Status : Answered
Chosen Option : 1

Q.43 What type of substation is used for power factor correction, metering and control of the wind farm?

- Ans** 1. Collector substation
 2. Converter substation
 3. Relay substation
 4. Distribution substation

Question ID : 264330184556
Option 1 ID : 264330722925
Option 2 ID : 264330722926
Option 3 ID : 264330722927
Option 4 ID : 264330722924
Status : Answered
Chosen Option : 3

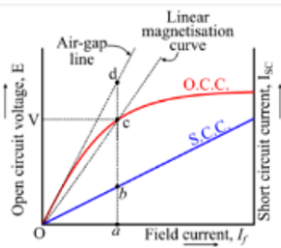
Q.44 What type of substation is responsible for transferring power from the transmission system to the distribution system of an area?

- Ans** 1. Distribution substation
 2. Collector substation
 3. Converter substation
 4. Relay substation

Question ID : 264330184484
Option 1 ID : 264330722636
Option 2 ID : 264330722637
Option 3 ID : 264330722638
Option 4 ID : 264330722639
Status : Answered
Chosen Option : 1



Q.45 What is the unsaturated synchronous reactance (X_{su}) in an alternator if the armature resistance is neglected according to the following graph?



- Ans**
- 1. $X_{su} = E_{ad} I_{ab}$
 - 2. $X_{su} = E_{ad} / I_{ab}$
 - 3. $X_{su} = R_a + jZ_{su}$
 - 4. $X_{su} = 1 / (R_a + jX_{su})$

Question ID : 264330184534

Option 1 ID : 264330722838

Option 2 ID : 264330722836

Option 3 ID : 264330722837

Option 4 ID : 264330722839

Status : Answered

Chosen Option : 2

Q.46 What is the purpose of the trigger circuit in a Cathode Ray Oscilloscope (CRO)?

- Ans**
- 1. To control the power supply circuit
 - 2. To generate the electron beam
 - 3. To synchronise the horizontal and vertical deflections
 - 4. To amplify the input signal

Question ID : 264330184513

Option 1 ID : 264330722755

Option 2 ID : 264330722752

Option 3 ID : 264330722754

Option 4 ID : 264330722753

Status : Answered

Chosen Option : 3

Q.47 Identify whether the following statements are true or false.

1. Capacitor start motors are more costly than split-phase induction motors.
2. In two-value capacitor motors, the two capacitors are connected in parallel at the starting.

- Ans**
- 1. Both the statements are true
 - 2. Statement 1 is true and statement 2 is false
 - 3. Both the statements are false
 - 4. Statement 1 is false and statement 2 is true

Question ID : 264330184606
Option 1 ID : 264330723124
Option 2 ID : 264330723125
Option 3 ID : 264330723127
Option 4 ID : 264330723126
Status : Answered
Chosen Option : 1

Q.48 With reference to PMMC instruments, which of the following statements are correct?

- I. For PMMC instruments, the scale is not uniform.
- II. PMMC instruments can be used for AC as well as DC quantities.
- III. In PMMC instruments, power consumption is low.
- IV. PMMC instruments offer a high torque/weight ratio.

- Ans**
- 1. III and IV
 - 2. II and IV
 - 3. I and III
 - 4. I and II

Question ID : 264330184592
Option 1 ID : 264330723069
Option 2 ID : 264330723071
Option 3 ID : 264330723070
Option 4 ID : 264330723068
Status : Answered
Chosen Option : 1

Q.49 Two coils having self-inductance of 6 H and 24 H, respectively, are magnetically coupled. Find the maximum possible value of mutual inductance.

- Ans**
- 1. 6 H
 - 2. 24 H
 - 3. 12 H
 - 4. 18 H

Question ID : 264330184582
Option 1 ID : 264330723028
Option 2 ID : 264330723031
Option 3 ID : 264330723029
Option 4 ID : 264330723030
Status : Answered
Chosen Option : 3

Q.50 What is a common technique used to reduce core losses and the magnetising component in a current transformer?

- Ans**
- 1. Increasing the turns ratio of the current transformer
 - 2. Utilising laminated cores made of insulated sheets
 - 3. Using thicker core materials for better conductivity
 - 4. Decreasing the number of windings in the secondary coil

Question ID : 264330184457
Option 1 ID : 264330722528
Option 2 ID : 264330722530
Option 3 ID : 264330722529
Option 4 ID : 264330722531
Status : Answered
Chosen Option : 2

Q.51 Candela per square metre is the unit of _____.

- Ans**
- 1. illumination
 - 2. luminous flux
 - 3. luminance
 - 4. luminous intensity

Question ID : 264330184633
Option 1 ID : 264330723234
Option 2 ID : 264330723232
Option 3 ID : 264330723235
Option 4 ID : 264330723233
Status : Answered
Chosen Option : 3

Q.52 In a DC series motor, what is the relationship between speed and armature current?

- Ans**
- 1. Speed is directly proportional to armature current.
 - 2. Speed is independent of armature current.
 - 3. Speed is directly proportional to the square of armature current.
 - 4. Speed is inversely proportional to armature current.

Question ID : 264330184458
Option 1 ID : 264330722533
Option 2 ID : 264330722534
Option 3 ID : 264330722535
Option 4 ID : 264330722532
Status : Answered
Chosen Option : 4

Q.53 What are the zero power factor characteristics (ZPFC) used for in the context of alternators?

- Ans
- 1. To determine the synchronous speed of the alternator
 - 2. To assess the power factor when the alternator is loaded by reactors
 - 3. To plot the armature terminal voltage per phase against field current
 - 4. To calculate the short-circuit voltage of the alternator

Question ID : 264330184532
Option 1 ID : 264330722828
Option 2 ID : 264330722831
Option 3 ID : 264330722829
Option 4 ID : 264330722830
Status : Answered
Chosen Option : 4

Q.54 What are the two types of breakdowns that can occur in p-n junctions?

- Ans
- 1. Zener and capacitive breakdowns
 - 2. Avalanche and tunnelling breakdowns
 - 3. Voltage and current breakdowns
 - 4. Forward and reverse breakdowns

Question ID : 264330184561
Option 1 ID : 264330722945
Option 2 ID : 264330722944
Option 3 ID : 264330722947
Option 4 ID : 264330722946
Status : Marked For Review
Chosen Option : 2

Q.55 For a certain D-MOSFET, $I_{DSS} = 10 \text{ mA}$ and $V_{GS(off)} = -8 \text{ V}$. Calculate I_D at $V_{GS} = -4 \text{ V}$.

- Ans
- 1. 2.5 mA
 - 2. 20 mA
 - 3. 50 mA
 - 4. 5 mA

Question ID : 264330184640
Option 1 ID : 264330723260
Option 2 ID : 264330723262
Option 3 ID : 264330723263
Option 4 ID : 264330723261
Status : Answered
Chosen Option : 1

Q.56 Which type of electric meter is typically used for measuring energy consumption in large commercial and industrial properties with high energy needs?

- Ans**
- 1. Smart meters
 - 2. Single-phase meters
 - 3. Prepayment meters
 - 4. Three-phase meters

Question ID : 264330184516
Option 1 ID : 264330722766
Option 2 ID : 264330722764
Option 3 ID : 264330722765
Option 4 ID : 264330722767
Status : **Marked For Review**
Chosen Option : 4

Q.57 Why is grounding important in the design of a substation?

- Ans**
- 1. To facilitate access for maintenance
 - 2. To protect against environmental effects
 - 3. To protect passers-by during a short circuit in the transmission system
 - 4. To ensure room for expansion due to load growth

Question ID : 264330184477
Option 1 ID : 264330722609
Option 2 ID : 264330722608
Option 3 ID : 264330722610
Option 4 ID : 264330722611
Status : **Marked For Review**
Chosen Option : 3

Q.58 The property related to hard magnetic materials is:

- Ans**
- 1. high retentivity
 - 2. high permeability
 - 3. low coercive force
 - 4. low hysteresis loss

Question ID : 264330184444
Option 1 ID : 264330722476
Option 2 ID : 264330722477
Option 3 ID : 264330722478
Option 4 ID : 264330722479
Status : **Marked For Review**
Chosen Option : 3

Q.59 What is the advantage of overhead cables compared to underground cables in terms of construction?

Ans 1. Overhead cables are better insulated.

2.

Overhead cables are more protected against moisture and corrosion.

3. Overhead cables are less expensive to construct.

4. Overhead cables are more environmentally friendly.

Question ID : 264330184482

Option 1 ID : 264330722629

Option 2 ID : 264330722631

Option 3 ID : 264330722630

Option 4 ID : 264330722628

Status : Answered

Chosen Option : 3

Q.60 What is a brownout in the context of electrical power supply?

Ans 1.

Protection from power surges using surge protectors and circuit breakers

2. A complete loss of power to a geographic area

3.

A drop in the electrical power supply causing a drop in voltage

4.

A phenomenon that affects high power installations, leading to partial electric discharges

Question ID : 264330184470

Option 1 ID : 264330722583

Option 2 ID : 264330722580

Option 3 ID : 264330722581

Option 4 ID : 264330722582

Status : Answered

Chosen Option : 2

Q.61 In a parallel RC circuit, the phase difference between the applied voltage and the voltage across R and C in parallel will be _____.

Ans 1. 45°

2. 30°

3. 90°

4. 0°

Question ID : 264330184588

Option 1 ID : 264330723054

Option 2 ID : 264330723053

Option 3 ID : 264330723055

Option 4 ID : 264330723052

Status : Answered

Chosen Option : 4

Q.62 Which type of water turbine is generally suitable for high-head, low-flow applications?

- Ans
- 1. Francis turbine
 - 2. Cross-flow turbine
 - 3. Pelton turbine
 - 4. Kaplan turbine

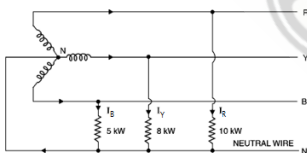
Question ID : 264330184543
Option 1 ID : 264330722874
Option 2 ID : 264330722873
Option 3 ID : 264330722872
Option 4 ID : 264330722875
Status : Answered
Chosen Option : 3

Q.63 How does armature reaction affect the main field flux in an alternator when the load has a power factor of zero leading?

- Ans
- 1. Armature reaction weakens the main field flux and reduces the generated EMF.
 - 2. Armature reaction distorts the main field flux and weakens it.
 - 3. Armature reaction distorts the main field flux and does not affect its strength.
 - 4. Armature reaction strengthens the main field flux and does not distort it.

Question ID : 264330184533
Option 1 ID : 264330722835
Option 2 ID : 264330722832
Option 3 ID : 264330722833
Option 4 ID : 264330722834
Status : Answered
Chosen Option : 4

Q.64 Non-reactive loads of 10 kW, 8 kW and 5 kW are connected between the neutral and the red, yellow, and blue phases, respectively, of a 3-phase, 4-wire system. The line voltage is 400 V. Calculate the current I_R .



- Ans
- 1. 21.6 A
 - 2. 34.6 A
 - 3. 43.3 A
 - 4. 18.9 A

Question ID : 264330184627
Option 1 ID : 264330723210
Option 2 ID : 264330723209
Option 3 ID : 264330723208
Option 4 ID : 264330723211
Status : Answered
Chosen Option : 3

Q.65 What type of transmission line is characterised by a length ranging from 80 km to 240 km and includes both inductance and capacitance effects?

- Ans**
- 1. DC transmission line
 - 2. Long transmission line
 - 3. Medium transmission line
 - 4. Short transmission line

Question ID : 264330184545
Option 1 ID : 264330722882
Option 2 ID : 264330722881
Option 3 ID : 264330722883
Option 4 ID : 264330722880
Status : Answered
Chosen Option : 3

Q.66 With reference to wind turbines, which of the following statements are correct?

- I. In a propeller-type turbine, the number of blades is three to six.
- II. The Darrieus type of turbine is an example of vertical axis turbines.
- III. Propeller type turbines are rarely used.
- IV. A multi-blade type turbine is an example of horizontal axis turbines.

- Ans**
- 1. I, II and IV
 - 2. I, II and III
 - 3. II, III and IV
 - 4. I, III and IV



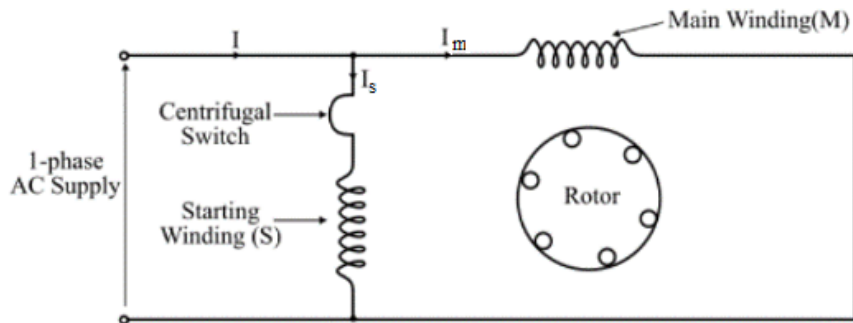
Question ID : 264330184618
Option 1 ID : 264330723174
Option 2 ID : 264330723172
Option 3 ID : 264330723173
Option 4 ID : 264330723175
Status : Not Attempted and Marked For Review
Chosen Option : --

Q.67 What is the electrical power consumed by a circuit if a current of 4 A flows through a resistance of 5 k Ω ?

- Ans**
- 1. 8000 W
 - 2. 80 kW
 - 3. 800 W
 - 4. 800 kW

Question ID : 264330184435
Option 1 ID : 264330722442
Option 2 ID : 264330722440
Option 3 ID : 264330722441
Option 4 ID : 264330722443
Status : Answered
Chosen Option : 2

Q.68 identify the type of single-phase motor shown in the following figure.



- Ans
- 1. Permanent-split capacitor
 - 2. Shaded pole motor
 - 3. Split-phase induction motor
 - 4. Capacitor-start motor

Question ID : 264330184530
Option 1 ID : 264330722822
Option 2 ID : 264330722821
Option 3 ID : 264330722823
Option 4 ID : 264330722820
Status : Answered
Chosen Option : 3

Q.69 Which of the following terms is NOT related to nuclear power plants?

- Ans
- 1. Control rod
 - 2. Electrostatic precipitator
 - 3. Moderator
 - 4. Nuclear reactor

Question ID : 264330184616
Option 1 ID : 264330723164
Option 2 ID : 264330723166
Option 3 ID : 264330723165
Option 4 ID : 264330723167
Status : Answered
Chosen Option : 2

Q.70 The starting torque of a resistance-start induction motor is _____ times the full load torque.

- Ans**
- 1. 1.5
 - 2. 4.5
 - 3. 9.5
 - 4. 7.5

Question ID : 264330184604
Option 1 ID : 264330723116
Option 2 ID : 264330723117
Option 3 ID : 264330723119
Option 4 ID : 264330723118
Status : Answered
Chosen Option : 1

Q.71 What is the primary property of a dielectric material that makes it suitable for dielectric heating?

- Ans**
- 1. High electrical conductivity
 - 2. Inefficient heat dissipation
 - 3. Ability to be polarised by an applied electric field
 - 4. Low electrostatic field support

Question ID : 264330184486
Option 1 ID : 264330722644
Option 2 ID : 264330722647
Option 3 ID : 264330722646
Option 4 ID : 264330722645
Status : Answered
Chosen Option : 3

Q.72 Identify whether the following statements are true or false.

- I. There is no skin effect in the DC transmission system.
- II. In DC transmission, corona losses are very large.

- Ans**
- 1. Statement 1 is true and statement 2 is false
 - 2. Both the statements are false
 - 3. Statement 1 is false and statement 2 is true
 - 4. Both the statements are true

Question ID : 264330184622
Option 1 ID : 264330723189
Option 2 ID : 264330723191
Option 3 ID : 264330723190
Option 4 ID : 264330723188
Status : Answered
Chosen Option : 1

Q.73 Calculate the speed of the 8-pole alternator if the supply frequency is 50 Hz.

- Ans
- 1. 750 rpm
 - 2. 1500 rpm
 - 3. 1000 rpm
 - 4. 500 rpm

Question ID : 264330184610
Option 1 ID : 264330723141
Option 2 ID : 264330723143
Option 3 ID : 264330723142
Option 4 ID : 264330723140
Status : Answered
Chosen Option : 1

Q.74 Which type of turbine has adjustable blades and wicket gates, allowing for a wider range of operation?

- Ans
- 1. Bulb turbine
 - 2. Tube turbine
 - 3. Straflo turbine
 - 4. Kaplan turbine

Question ID : 264330184472
Option 1 ID : 264330722588
Option 2 ID : 264330722590
Option 3 ID : 264330722589
Option 4 ID : 264330722591
Status : Not Attempted and Marked For Review
Chosen Option : --

Q.75 What is the application of overexcited synchronous motors?

- Ans
- 1. Operating centrifugal pumps
 - 2. Controlling voltage at the end of long transmission lines
 - 3. Generating different frequencies
 - 4. Power factor correction for lagging loads

Question ID : 264330184461
Option 1 ID : 264330722544
Option 2 ID : 264330722547
Option 3 ID : 264330722545
Option 4 ID : 264330722546
Status : Answered
Chosen Option : 4

Q.76 For $C = 101.5 \text{ nF}$, determine L for the series resonant circuit if the resonant frequency is 2800 Hz .

- Ans**
- 1. 26.56 mH
 - 2. 46.45 mH
 - 3. 31.83 mH
 - 4. 16.32 mH

Question ID : **264330184449**
Option 1 ID : **264330722497**
Option 2 ID : **264330722499**
Option 3 ID : **264330722498**
Option 4 ID : **264330722496**
Status : **Answered**
Chosen Option : **3**

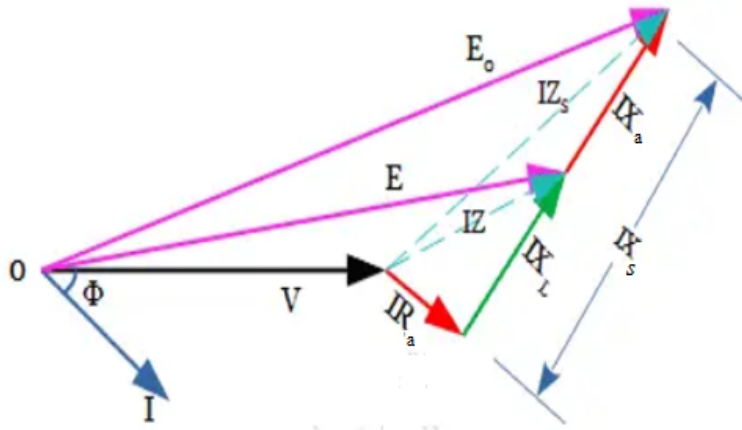
Q.77 Which types of losses in a transformer are equal to each other, resulting in maximum efficiency of the transformer?

- Ans**
- 1. Core loss and hysteresis loss
 - 2. Iron loss and copper loss
 - 3. Eddy current loss and mechanical loss
 - 4. Copper loss and winding loss

Question ID : **264330184523**
Option 1 ID : **264330722792**
Option 2 ID : **264330722795**
Option 3 ID : **264330722794**
Option 4 ID : **264330722793**
Status : **Answered**
Chosen Option : **2**



Q.78 In the phasor diagram of an alternator, what does the angle Φ represent?



- Ans 1. Phase angle between voltage and current
 2. Leakage flux
 3. Synchronous reactance
 4. Power factor

Question ID : 264330184466
Option 1 ID : 264330722567
Option 2 ID : 264330722565
Option 3 ID : 264330722564
Option 4 ID : 264330722566
Status : Answered
Chosen Option : 1

Q.79 Which type of motor requires a DC supply to the rotor to generate the rotor's magnetic field and uses damper windings for starting?

- Ans 1. Reluctance Motor
 2. Direct Current Excited Motor
 3. Permanent Magnet Synchronous Motor
 4. Three-Phase Induction Motor

Question ID : 264330184467
Option 1 ID : 264330722569
Option 2 ID : 264330722571
Option 3 ID : 264330722568
Option 4 ID : 264330722570
Status : Answered
Chosen Option : 2

Q.80 The voltage gain in common collector configuration of a BJT is _____.

- Ans**
- 1. less than one
 - 2. above 100
 - 3. between 50 and 100
 - 4. zero

Question ID : 264330184638
Option 1 ID : 264330723253
Option 2 ID : 264330723255
Option 3 ID : 264330723254
Option 4 ID : 264330723252
Status : Answered
Chosen Option : 1

Q.81 What is the function of the moderator in a nuclear reactor during the process of nuclear fission?

- Ans**
- 1. Slowing down the neutrons produced by fission
 - 2. Increasing the reaction rate
 - 3. Cooling down the reactor core
 - 4. Spinning the turbine

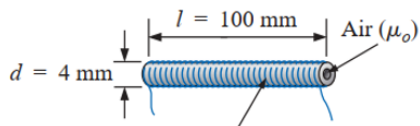
Question ID : 264330184474
Option 1 ID : 264330722597
Option 2 ID : 264330722596
Option 3 ID : 264330722599
Option 4 ID : 264330722598
Status : Answered
Chosen Option : 1

Q.82 Given a 250 : 5 current transformer used with an ammeter reading of 2.7 A, what is the line current (primary current) in the circuit?

- Ans**
- 1. 250 A
 - 2. 84 A
 - 3. 36 A
 - 4. 135 A

Question ID : 264330184455
Option 1 ID : 264330722520
Option 2 ID : 264330722522
Option 3 ID : 264330722523
Option 4 ID : 264330722521
Status : Answered
Chosen Option : 4

Q.83 Find the number of turns of the coil shown in the following figure, if the inductance of the coil is $1.58 \mu\text{H}$.



- Ans**
- 1. 25
 - 2. 100
 - 3. 78
 - 4. 50

Question ID : 264330184505

Option 1 ID : 264330722720

Option 2 ID : 264330722723

Option 3 ID : 264330722722

Option 4 ID : 264330722721

Status : Answered

Chosen Option : 2

Q.84 The maximum load torque that can be applied to the shaft of an unexcited stepper motor, without causing continuous rotation, is called _____.

- Ans**
- 1. running torque
 - 2. pull-in torque
 - 3. pull-out torque
 - 4. detent torque

Question ID : 264330184607

Option 1 ID : 264330723128

Option 2 ID : 264330723130

Option 3 ID : 264330723131

Option 4 ID : 264330723129

Status : Answered

Chosen Option : 3

Q.85 Which part of a DC motor is responsible for creating the mechanical revolutions of the unit?

- Ans**
- 1. Rotor
 - 2. Commutator
 - 3. Brushes
 - 4. Stator

Question ID : 264330184456

Option 1 ID : 264330722526

Option 2 ID : 264330722525

Option 3 ID : 264330722527

Option 4 ID : 264330722524

Status : Answered

Chosen Option : 1

Q.86 What is the purpose of damper winding in a synchronous motor?

Ans 1.

To provide a backup power source in case of a power outage

2. To assist in the motor's starting as an induction motor

3. To control the speed of the synchronous motor

4. To generate additional torque for higher efficiency

Question ID : 264330184536

Option 1 ID : 264330722845

Option 2 ID : 264330722847

Option 3 ID : 264330722846

Option 4 ID : 264330722844

Status : Answered

Chosen Option : 2

Q.87 What is the resonant frequency of an RLC circuit with the given values of resistance ($R = 30 \Omega$), inductance ($L = 1.3$ mH), and capacitance ($C = 30 \mu\text{F}$)?

Ans 1. 306.63 Hz

2. 100.53 Hz

3. 625.23 Hz

4. 254.80 Hz

Question ID : 264330184508

Option 1 ID : 264330722733

Option 2 ID : 264330722732

Option 3 ID : 264330722734

Option 4 ID : 264330722735

Status : Answered

Chosen Option : 4

Q.88 In a single-phase RL series circuit, if the current lags the supply voltage by an angle of 60° , then the voltage across the inductor leads the supply voltage by an angle of _____.

Ans 1. 30°

2. 0°

3. 60°

4. 90°

Question ID : 264330184570

Option 1 ID : 264330722981

Option 2 ID : 264330722980

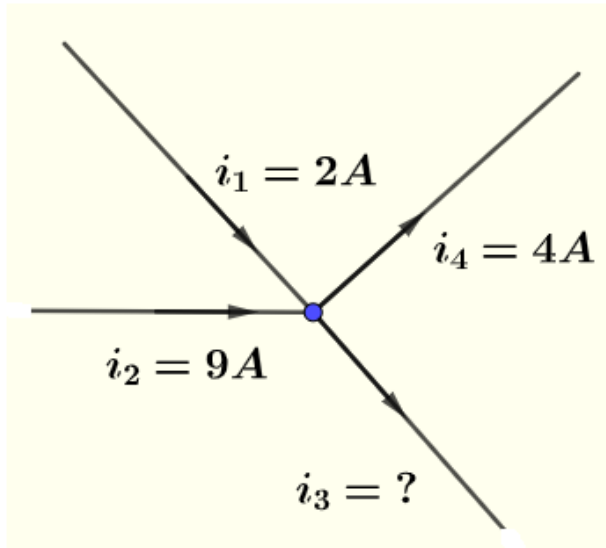
Option 3 ID : 264330722982

Option 4 ID : 264330722983

Status : Answered

Chosen Option : 1

Q.89 Find the current ' i_3 ' in the following diagram.



- Ans
- 1. 11 A
 - 2. 5 A
 - 3. 7 A
 - 4. 3 A

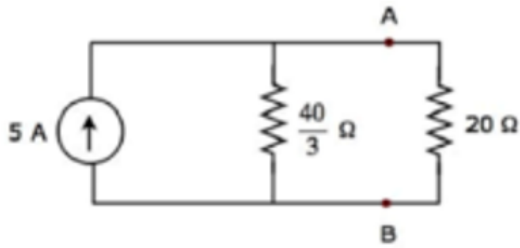
Question ID : 264330184571
Option 1 ID : 264330722987
Option 2 ID : 264330722985
Option 3 ID : 264330722986
Option 4 ID : 264330722984
Status : Answered
Chosen Option : 3

Q.90 Which component of the total cost of electrical energy is proportional to the energy generated (kWh)?

- Ans
- 1. Running cost
 - 2. Depreciation cost
 - 3. Semi-fixed cost
 - 4. Fixed cost

Question ID : 264330184538
Option 1 ID : 264330722854
Option 2 ID : 264330722855
Option 3 ID : 264330722853
Option 4 ID : 264330722852
Status : Answered
Chosen Option : 1

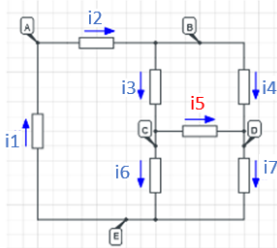
Q.91 Find the current through $20\ \Omega$ resistance in the circuit shown in the following figure.



- Ans
- 1. 3 A
 - 2. 2 A
 - 3. 4 A
 - 4. 4.5 A

Question ID : 264330184500
 Option 1 ID : 264330722701
 Option 2 ID : 264330722700
 Option 3 ID : 264330722702
 Option 4 ID : 264330722703
 Status : Answered
 Chosen Option : 2

Q.92 In the provided circuit, which of the following represents the correct Kirchhoff's Current Law (KCL) equation for node D?



- Ans
- 1. $i_3 = i_5 + i_6$
 - 2. $i_4 + i_5 = i_7$
 - 3. $i_4 + i_5 = -i_7$
 - 4. $i_2 = i_3 + i_4$

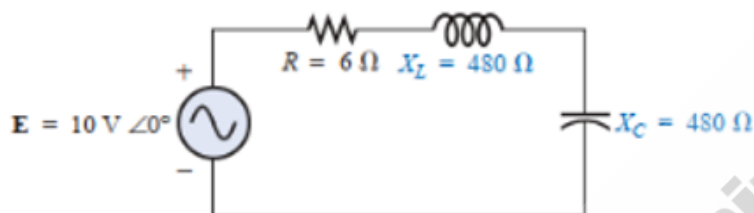
Question ID : 264330184495
 Option 1 ID : 264330722681
 Option 2 ID : 264330722683
 Option 3 ID : 264330722682
 Option 4 ID : 264330722680
 Status : Answered
 Chosen Option : 2

Q.93 The direction of rotation of a conductor in a _____ is obtained by Fleming's left-hand rule.

- Ans
- 1. DC generator
 - 2. transformer
 - 3. alternator
 - 4. DC motor

Question ID : 264330184595
Option 1 ID : 264330723081
Option 2 ID : 264330723083
Option 3 ID : 264330723082
Option 4 ID : 264330723080
Status : Answered
Chosen Option : 4

Q.94 What is the quality factor for the given series resonance circuit?



- Ans
- 1. 40
 - 2. 160
 - 3. 80
 - 4. 320

Question ID : 264330184448
Option 1 ID : 264330722492
Option 2 ID : 264330722494
Option 3 ID : 264330722493
Option 4 ID : 264330722495
Status : Answered
Chosen Option : 3

Q.95 How is the magnetomotive force per unit length denoted, and what is its symbol in equation form?

- Ans
- 1. Magnetic density (B)
 - 2. Magnetic permeability (μ)
 - 3. Magnetising force (H)
 - 4. Magnetic flux (Φ)

Question ID : 264330184440
Option 1 ID : 264330722463
Option 2 ID : 264330722462
Option 3 ID : 264330722461
Option 4 ID : 264330722460
Status : Answered
Chosen Option : 3

Q.96 Which materials are classified as ferromagnetic based on their permeabilities compared to free space?

Ans 1. Materials with permeabilities the same as that of free space

2.

Materials with permeabilities hundreds and thousands of times greater than that of free space

3.

Materials with permeabilities slightly less than that of free space

4.

Materials with permeabilities slightly greater than that of free space

Question ID : 264330184443

Option 1 ID : 264330722474

Option 2 ID : 264330722473

Option 3 ID : 264330722472

Option 4 ID : 264330722475

Status : Answered

Chosen Option : 2

Q.97 Identify whether the following statements with reference to magnetic circuits are true or false.

1. Magnetic flux lines never intersect.

2. Each line of a magnetic flux is a closed loop by itself.

Ans 1. Statement 1 is false and statement 2 is true

2. Both the statements are false

3. Both the statements are true

4. Statement 1 is true and statement 2 is false

Question ID : 264330184579

Option 1 ID : 264330723018

Option 2 ID : 264330723019

Option 3 ID : 264330723016

Option 4 ID : 264330723017

Status : Answered

Chosen Option : 3

Q.98 Which of the following statements is INCORRECT for a reluctance motor?

Ans 1. The rotor of a reluctance motor rotates with constant speed.

2. A reluctance motor has poor efficiency.

3.

A reluctance motor is cheaper than any other kind of synchronous motor.

4.

A reluctance motor can operate on AC as well as DC supply.

Question ID : 264330184602

Option 1 ID : 264330723109

Option 2 ID : 264330723108

Option 3 ID : 264330723110

Option 4 ID : 264330723111

Status : Answered

Chosen Option : 4

Q.99 Which of the following is NOT a characteristic of a radial distribution system?

- Ans**
- 1. Power flows in only one direction
 - 2. Simple construction
 - 3. Low cost
 - 4. Highly reliable

Question ID : 264330184623
Option 1 ID : 264330723195
Option 2 ID : 264330723192
Option 3 ID : 264330723193
Option 4 ID : 264330723194
Status : Answered
Chosen Option : 4

Q.100 Identify whether the following statements related to starters in DC motors are true or false.

1. In a three-point starter, electromagnets are used as overload release coil.
2. Two-point starters are used with DC series motors.

- Ans**
- 1. Statement 1 is false and statement 2 is true
 - 2. Both the statements are true
 - 3. Both the statements are false
 - 4. Statement 1 is true and statement 2 is false

Question ID : 264330184599
Option 1 ID : 264330723098
Option 2 ID : 264330723096
Option 3 ID : 264330723099
Option 4 ID : 264330723097
Status : Answered
Chosen Option : 2

