Junior Engineer Civil Mechanical and Electrical Examination 2023 Paper I

Exam Date	09/10/2023
Exam Time	5:00 PM - 7:00 PM
Subject	Junior Engineer 2023 Electrical Paper I

Section : **General Intelligence and Reasoning**

Q.1 **Select the word-pair in which the two words are related in the same way as are the two words in the given pair.**
(The words must be considered as meaningful English words and must not be related to each other based on the number of letters/number of consonants/vowels in the word.)
Hamper : Retard

Ans
✗ 1. Hamstrung : Encourage
✗ 2. Jovial : Solemn
✓ 3. Insipid : Tedious
✗ 4. Hypocrisy : Frankness

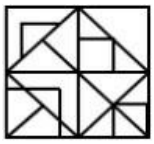
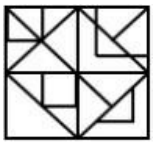
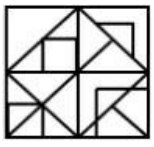
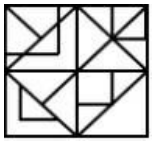
Q.2 **Select the correct mirror image of the given figure when the mirror is placed at MN as shown below.**

Ans
✗ 1. ꓕUꓤHꓤOIUꓤꓶGꓶK
✓ 2. TUꓤHTOIUꓤ⅁ꓶK
✗ 3. ꓘꓶ⅁ꓶUꓤIOTHꓤUꓕ
✗ 4. KLIOTHGJRURUT

Q.3 **'OU22' is related to 'LF11' in a certain way. In the same way, 'TN12' is related to 'GM6'. Which of the following is related to 'AP22' using the same logic?**

Ans
✗ 1. YK44
✗ 2. ZL44
✓ 3. ZK44
✗ 4. ZK88

Q.4 **Select the option in which the given figure is embedded (rotation is NOT allowed).**

Ans
✗ 1. 
✗ 2. 
✗ 3. 
✓ 4. 

Q.5 In a certain code language, 'LIGHTS' is written as '93' and 'BATTER' is written as '102'. How will 'BRING' be written in that language?

Ans
- ✓ 1. 90
- ✗ 2. 95
- ✗ 3. 85
- ✗ 4. 63

Q.6 Select the word-pair in which the two words are related in the same way as are the two words in the given pair.
(The words must be considered as meaningful English words and must not be related to each other based on the number of letters/number of consonants/vowels in the word.)
Seismology : Earthquake

Ans
- ✗ 1. Taxonomy : Taxation
- ✗ 2. Haematology : Hydrogen
- ✗ 3. Physiology : Physics
- ✓ 4. Herpetology : Amphibians

Q.7 In a certain code language, 'PETS' is coded as '48', and 'FARM' is coded as '70'. How will 'DAIRY' be coded in that language?

Ans
- ✓ 1. 78
- ✗ 2. 74
- ✗ 3. 47
- ✗ 4. 22

Q.8 A is B's wife. F is the grandson of B. D is the father of F. C is A's daughter. How is F related to C?

Ans
- ✓ 1. Brother's son
- ✗ 2. Mother
- ✗ 3. Brother
- ✗ 4. Mother's sister

Q.9 Select the correct combination of mathematical signs that can sequentially replace the boxes and balance the given equation.

30 □ 13 □ 21 □ 3 □ 2 □ 4 □ 2

Ans
- ✗ 1. –, +, ÷, ×, =, +
- ✗ 2. –, +, ×, =, ÷, +
- ✓ 3. –, –, ÷, =, ×, +
- ✗ 4. +, –, ÷, ×, =, +

Q.10 In a certain code language, 'BRANCH' is coded as DUCQEK and 'CARBON' is coded as EDTEQQ. How will 'DRIVEN' be coded in that language?

Ans
- ✓ 1. FUKYGQ
- ✗ 2. GUKYGQ
- ✗ 3. GUKZGR
- ✗ 4. FUJYHQ

Q.11 Select the option that represents the letters that, when sequentially placed from left to right in the blanks below, will complete the letter series.
R _ _ KU _ IN _ URI _ K _ RI _ _ U

Ans
- ✗ 1. I N K R N U N K
- ✗ 2. I N R K U N N K
- ✓ 3. I N R K N U N K
- ✗ 4. I N R K N U U K

Q.12 Which letter cluster will replace the question mark (?) to complete the given series?

MKXB, OOAC, QSDD, ?

Ans
- ✓ 1. SWGE
- ✗ 2. SWGF
- ✗ 3. SWHE
- ✗ 4. SWHF

Q.13 Which letter-cluster will replace the question mark (?) to complete the given series?

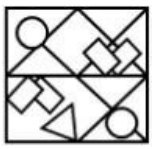
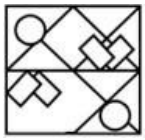
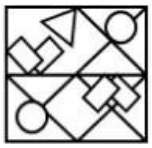
TTIR, PHMJ, LVQB, ?, DXYL

Ans
✓ 1. HJUT
✗ 2. GJUT
✗ 3. HKUT
✗ 4. GKUT

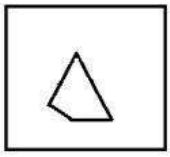
Q.14 Which two signs should be interchanged to make the given equation correct?
11 – 8 + 78 ÷ 6 × 37 = 64

Ans
✗ 1. × and +
✗ 2. ÷ and ×
✓ 3. – and ×
✗ 4. ÷ and –

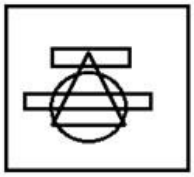
Q.15 Select the option in which the given figure is embedded (rotation is NOT allowed).

Ans
1. ✗ 
2. ✗ 
3. ✗ 
4. ✓ 

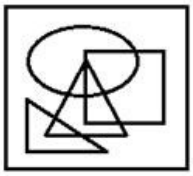
Q.16 Select the option in which the given figure is embedded (rotation is NOT allowed).



Ans

1. ✗ 

2. ✗ 

3. ✓ 

4. ✗ 

Q.17 **Select the option that is related to the third term in the same way as the second term is related to the first term and the sixth term is related to the fifth term.**
3 : 20 :: 7 : ? :: 11 : 68

Ans

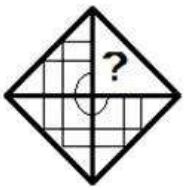
✗ 1. 37

✗ 2. 39

✗ 3. 41

✓ 4. 44

Q.18 Select the figure from the options that can replace the question mark (?) and complete the given pattern.



Ans

1. 

2. 

3. 

4. 

Q.19 **Select the option that is related to the third word in the same way as the second word is related to the first word. (The words must be considered as meaningful English words and must not be related to each other based on the number of letters/number of consonants/vowels in the word)**

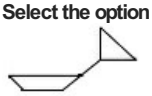
Persuade : Discourage : : Profound : ?

Ans
- 1. Clever
- 2. Sincere
- 3. Superficial
- 4. Intense

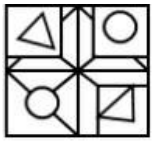
Q.20 **Select the option that represents the letters that, when sequentially placed from left to right in the blanks below, will complete the letter series.**
A_ _ J L_ D G_ L A D_ J _ A D_ _ L

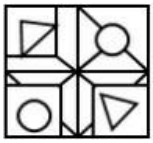
Ans
- 1. D G A L G L G J
- 2. D G A J G L G J
- 3. D G A L G J G J
- 4. D A G J G L G L

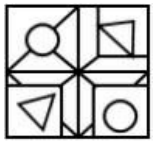
Q.21 Select the option in which the given figure is embedded (rotation is NOT allowed).

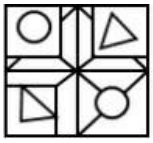


Ans

1. 

2. 

3. 

4. 

Q.22 Select the option that represents the correct order of the given words as they would appear in an English dictionary.
1. Object
2. Obey
3. Obligation
4. Obedience
5. Obligatory

Ans
1. 1. 4, 2, 3, 1, 5
2. 2. 4, 2, 1, 3, 5
3. 3. 2, 4, 1, 3, 5
4. 4. 4, 2, 1, 5, 3

Q.23 Two statements are given followed by two conclusions numbered I and II. Assuming the statements to be true, even if they seem to be at variance with commonly known facts, decide which of the conclusions logically follow(s) from the statements.

Statements:

All dogs are cats.

Some cows are cats but not dogs

Conclusions:

I. Some dogs are cows.

II. Some cats are both dogs and cows.

Ans
1. 1. Both conclusions I and II follow
2. 2. Only conclusion I follows
3. 3. Only conclusion II follows
4. 4. Neither conclusion I nor II follows

Q.24 Select the option that is related to the fourth number in the same way as the first number is related to the second number and the fifth number is related to the sixth number.

10 : 7 :: ? : 12 :: 32 : 18

Ans
1. 1. 22
2. 2. 15
3. 3. 18
4. 4. 20

Q.25 Select the option that represents the letters which, when sequentially placed from left to right in the blanks below, will complete the letter series.
L_MB__GM_OL_MBO

Ans
1. BGLOM
2. GLOBG
3. MGBLB
4. GOLBG

Q.26 Arrange the following words in a logical and meaningful order.
1. Quadrilateral
2. Heptagon
3. Pentagon
4. Hexadecagon
5. Dodecagon

Ans
1. 1, 3, 5, 2, 4
2. 1, 5, 3, 2, 4
3. 4, 2, 3, 5, 1
4. 4, 5, 2, 3, 1

Q.27 Which of the following options will replace the question mark (?) in the given series?

$\frac{1}{289}, \frac{1}{17}, ?, 17$

Ans
1. $\frac{1}{85}$
2. $\frac{1}{34}$
3. 1
4. $\frac{1}{119}$

Q.28 A & B means 'A is the wife of B'.
A # B means 'A is the father of B'.
A @ B means 'A is the Son B'.
A%B means 'A is the husband of B'.
A+B means 'A is the mother of B'.
If A & B # C & D @ E %F + G, then how is C related to G?

Ans
1. Father's mother
2. Sister
3. Mother
4. Brother's wife

Q.29 Six friends are sitting in a circle. All of them are facing the centre. Samir is an immediate neighbour of Kiran. Gagan is an immediate neighbour of Pran and Vyom. Suman sits second to the right of Gagan. Kiran sits second to the right of Vyom.

Who sits third to the right of Suman?

Ans
1. Kiran
2. Vyom
3. Pran
4. Samir

Q.30 Select the set in which the numbers are related in the same way as are the numbers of the following sets.

(NOTE: Operations should be performed on the whole numbers, without breaking down the numbers into its constituent digits. E.g., 13 – Operations on 13 such as adding/subtraction/multiplying etc. to 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed)

(33,6,54)

(22, 7, 30)

Ans
- ✗ 1. (14, 4, 26)
- ✗ 2. (18, 3, 42)
- ✗ 3. (24, 2, 66)
- ✓ 4. (26, 8, 36)

Q.31 Select the option that represents the correct order of the given words as they would appear in an English dictionary.
1. Whisker
2. Whistle
3. Wistful
4. Wither
5. Whisper
6. Wishful

Ans
- ✗ 1. 5, 1, 2, 3, 4, 6
- ✓ 2. 1, 5, 2, 6, 3, 4
- ✗ 3. 5, 1, 2, 6, 3, 4
- ✗ 4. 1, 5, 2, 3, 6, 4

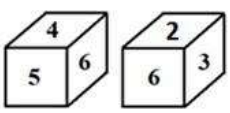
Q.32 A man departs from his house and walks 10 m towards north. He then turns left and walks 15 m. Now, he turns right and walks 7 m and stops. A pole is placed exactly 15 m east from where he stands. How far and in which direction is his house from the pole? (Assuming that all turns are 90 degree turns only.)

Ans
- ✗ 1. 27 m, north
- ✓ 2. 17 m, south
- ✗ 3. 7 m, north
- ✗ 4. 15 m, south

Q.33 Select the option that is related to the third term in the same way as the second term is related to the first term and the sixth term is related to the fifth term.
17 : 374 :: 14 : ? :: 13 : 234

Ans
- ✓ 1. 266
- ✗ 2. 296
- ✗ 3. 299
- ✗ 4. 269

Q.34 Two dimensions of the same dice are given below. Which of the following faces is opposite to the face having digit 3?



Ans
- ✗ 1. 1
- ✗ 2. 5
- ✗ 3. 2
- ✓ 4. 4

Q.35 Daisy starts walking from her house and goes 20 m west. From there she turns right and walks a certain distance called P m. Then she turns right and walks 30 m. She turns right again and walks 40 m. After that, she takes a final right turn and walks 10 m. If Daisy's current position is 5 m south of her home, then what is the value of P?

Ans
- ✓ 1. 35
- ✗ 2. 45
- ✗ 3. 15
- ✗ 4. 40

Q.36 If A denotes '+', B denotes '×', C denotes '–', and D denotes '÷', then what will come in place of '?' in the following equation?
89 C 8 A (18 B 2) D 4 = ?

Ans
1. 146
2. 81
3. 90
4. 89

Q.37 Select the number from among the given options that can replace the question mark (?) in the following series.
1, 6, 28, 71, 139, 236, ?

Ans
1. 366
2. 333
3. 335
4. 363

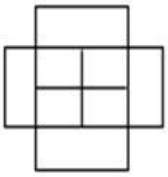
Q.38 If '+' means '–', '–' means '×', '×' means '÷', '÷' means '+', then what will come in place of the question mark (?) in the following equation?
41 ÷ 18 – 7 + 322 × 23 = ?

Ans
1. 167
2. 153
3. 169
4. 144

Q.39 Ten people are sitting in two parallel rows containing 5 people each, in such a way that there is equal distance between adjacent persons.
In Row 1 – A, B, C, D and E are seated and all of them are facing the south.
In Row 2 – P, Q, R, S and T are seated and all of them are facing the north.
Thus, each person is facing another person from the other row.
B is sitting third to the left of A. P is facing an immediate neighbour of A. Q is sitting third to the right of P. C is facing S. D is sitting second to the right of the person who is facing T.
Who amongst the following is NOT sitting at any of the extreme ends of the row?

Ans
1. C
2. R
3. Q
4. E

Q.40 Select the option that is embedded in the given figure (rotation is NOT allowed).



Ans
1. 
2. 
3. 
4. 

Q.41 Three statements are followed by three conclusions numbered I, II and III. You have to consider these statements to be true, even if they seem to be at variance with commonly known facts. Decide which of the given conclusions logically follow/s from the given statements.

Statements:

Few mountains are rivers.

Most rivers are valleys.

All valleys are hills.

Conclusions:

(I) Few mountains are valleys.

(II) Some hills are mountains.

(III) Some rivers are hills.

Ans
- ✗ 1. Only conclusion I follows
- ✗ 2. All the conclusions I, II and III follow
- ✓ 3. Only conclusion III follows
- ✗ 4. Either conclusion I or II and conclusion III follow

Q.42 Select the option that is related to the fourth term in the same way as the first term is related to the second term and the fifth term is related to the sixth term?

54 : 3 :: ? : 9 :: 432 : 6

Ans
- ✗ 1. 729
- ✓ 2. 1458
- ✗ 3. 477
- ✗ 4. 1089

Q.43 Select the word-pair that best represents a similar relationship to the one expressed in the pair of words given below. (The words must be considered as meaningful English words and must not be related to each other based on the number of letters/numbers of consonants/vowels in the word)
INDIA : NEW DELHI

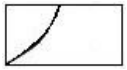
Ans
- ✗ 1. WEST BENGAL : KOLKATA
- ✗ 2. UP : LUCKNOW
- ✓ 3. RUSSIA : MOSCOW
- ✗ 4. SIKKIM : GANGTOK

Q.44 In a certain code language, "DILQ" is written as "FKNS" and "SBGK" is written as "UDIM". How will "FORA" be written in that language?

Ans
- ✗ 1. HRSC
- ✗ 2. GPSD
- ✗ 3. GRTD
- ✓ 4. HQTC

Q.45 Select the option that is embedded in the given figure (rotation is NOT allowed).

Ans

1. 
2. 
3. 
4. 

Q.46 Each of the seven friends, Misha, Minshu, Mohi, Priya, Veer, Pari and Krishi, has a different height. Krishi is taller than only three people. Pari is taller than only Veer. Misha is taller than Minshu but not Mohi. Priya is taller than Mohi.

Who is tallest among them?

Ans

1. Priya
2. Minshu
3. Krishi
4. Mohi

Q.47 Select the correct option that indicates the arrangement of the following words in a logical and meaningful order.
1. Shelf
2. Wood
3. Plank
4. Tree
5. Cupboard

Ans

1. 4 2 3 1 5
2. 2 4 5 1 3
3. 4 2 1 5 3
4. 2 4 3 5 1

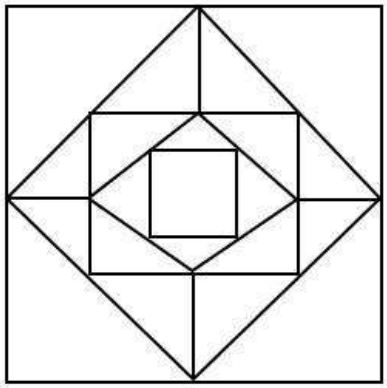
Q.48 Select the word-pair that best represents a similar relationship to the one expressed in the pair of words given below.
(The words must be considered as meaningful English words and must not be related to each other based on the number of letters/number of consonants/ vowels in the word.)

Mustang : Horse

Ans

1. Stag : Deer
2. Panthera Leo : Lion
3. Turkey : Fowl
4. Burmese : Cat

Q.49 How many triangles are there in the given figure?



Ans
✓ 1. 24
✗ 2. 26
✗ 3. 28
✗ 4. 30

Q.50 **Which of the following numbers will replace the question marks (?) in the given series?**
20, 30, 42, 56, ?, 90

Ans
✗ 1. 58
✓ 2. 72
✗ 3. 36
✗ 4. 78

Section : General Awareness

Q.1 **Which of the following refers to the net money value of all the final goods and services produced by the normal residents of a country, during a period of one year?**

Ans
✗ 1. Gross National Product at market price
✗ 2. Net National Product at market price
✗ 3. Gross National Product at factor cost
✓ 4. Net National Product at factor cost

Q.2 **The 11th Fundamental Duty was added to the Constitution of India by the_____ Constitutional Amendment Act.**

Ans
✗ 1. 88th
✗ 2. 81st
✓ 3. 86th
✗ 4. 83rd

Q.3 **Which of the following is NOT an Alicyclic compound?**

Ans
✗ 1. Cyclohexene
✗ 2. Cyclopropane
✗ 3. Cyclohexane
✓ 4. Isobutane

Q.4 **The White Paper on the five themes of Youth20 (Y20) was launched by _____ in Guwahati in February 2023.**

Ans
✗ 1. Nitin Gadkari
✓ 2. Anurag Thakur
✗ 3. Amit Shah
✗ 4. Piyush Goyal

Q.5 In which of the following dance forms the faces of dancers are made up to look like painted masks and the costume consists of a full skirt, a heavy jacket, numerous garlands and necklaces and a towering headdress?

Ans
- ✗ 1. Mohiniyattam
- ✗ 2. Odissi
- ✓ 3. Kathakali
- ✗ 4. Kathak

Q.6 Plants of which family have a highly compressed inflorescence branching system called a capitulum or flower head in which all the flowers are attached to a receptacle surrounded by unbranched bracts?

Ans
- ✗ 1. Sapindaceae
- ✓ 2. Asteraceae
- ✗ 3. Ericaceae
- ✗ 4. Ranunculaceae

Q.7 Which of the following is an example of good netiquette when participating in online discussion or forums?

Ans
- ✓ 1. Reading the discussion thread before posting to avoid repeating previous points
- ✗ 2. Using all caps
- ✗ 3. Attacking other users
- ✗ 4. Posting irrelevant or off-topic comments

Q.8 Identify an allotrope of carbon that is smooth and slippery.

Ans
- ✓ 1. Graphite
- ✗ 2. Lead
- ✗ 3. Fullerene
- ✗ 4. Diamond

Q.9 Which vitamin deficiency in the diet causes Korsakoff syndrome, a chronic memory disorder that damages your brain?

Ans
- ✓ 1. Thiamine
- ✗ 2. Niacin
- ✗ 3. Tocopherol
- ✗ 4. Phylloquinone

Q.10 The Bhitari Pillar inscription of which Gupta ruler narrates his fight with the Pushyamitras?

Ans
- ✓ 1. Skandagupta
- ✗ 2. Chandragupta I
- ✗ 3. Samudragupta
- ✗ 4. Chandragupta II

Q.11 _____ will be declared if the umpire thinks the batsman did NOT have a reasonable opportunity to score off the delivery.

Ans
- ✗ 1. Leg Bye
- ✗ 2. Bye
- ✗ 3. No Ball
- ✓ 4. Wide

Q.12 According to NITI Aayog's Multidimensional Poverty Index (MPI) based on NFHS-4 (2015-16), 51.91 per cent of the population of which state is multidimensionally poor?

Ans
- ✗ 1. Uttar Pradesh
- ✗ 2. Arunachal Pradesh
- ✓ 3. Bihar
- ✗ 4. Meghalaya

Q.13 Which of the following terminologies describes the areas where ecological communities, ecosystems or biotic regions coincide?

Ans
- ✗ 1. Benthos
- ✓ 2. Ecotones
- ✗ 3. Permafrost
- ✗ 4. Ecocline

Q.14 EV Ramaswamy Naicker founded the _____ Movement.

Ans
- ✓ 1. Self-Respect
- ✗ 2. Prarthana Samaj
- ✗ 3. Satyashodhak Samaj
- ✗ 4. Ghadar

Q.15 Where can you find solid form of water?

Ans
- ✗ 1. Oceans
- ✗ 2. Forest
- ✓ 3. Polar region
- ✗ 4. Desert

Q.16 What does the word Gopuram mean in the context of temple architecture of South India?

Ans
- ✗ 1. Top edge of the shikhara of the temple
- ✗ 2. Platform of the temple to place deity
- ✓ 3. Entrance gateway in front wall of the temple
- ✗ 4. Place to keep cows near the temple

Q.17 R–X is the general formula of which functional group in which one or more hydrogen atoms are replaced by Group 17 elements?

Ans
- ✓ 1. Alkyl halides
- ✗ 2. Amide
- ✗ 3. Nitrile
- ✗ 4. Imines

Q.18 Who has cracked the Panini code in his thesis?

Ans
- ✓ 1. Rishi Rajpopat
- ✗ 2. Prasann K. Sharma
- ✗ 3. Udai Singh Kumawat
- ✗ 4. Manish Mani Tiwari

Q.19 The Prime Minister's Employment Generation Programme (PMEGP) was launched by which Ministry of the Government of India during 2008-09?

Ans
- ✗ 1. Ministry of Agriculture and Farmers Welfare
- ✗ 2. Ministry of Home Affairs
- ✓ 3. Ministry of Micro, Small and Medium Enterprises
- ✗ 4. Ministry of Skill Development and Entrepreneurship

Q.20 Famous musician Ustad Amjad Ali Khan was born in 1945 in _____.

Ans
- ✗ 1. Agra
- ✗ 2. Lucknow
- ✓ 3. Gwalior
- ✗ 4. Jhansi

Q.21 At maturity, _____ is a non-conductive cell composed of heavily thick-walled dead cells with lignin and high cellulose content (60%–80%), and it serves to provide structural support in plants.

Ans
- ✓ 1. sclerenchyma cell
- ✗ 2. meristematic cell
- ✗ 3. reproductive cell
- ✗ 4. parenchyma cell

Q.22 Which 19th century German chemist visualised the ring structure of benzene in 1865?

Ans
- ✗ 1. Robert Bunsen
- ✗ 2. Marguerite Perey
- ✗ 3. Emil Fischer
- ✓ 4. Friedrich August Kekule

Q.23 Al Biruni wrote famous book "Kitab ul Hind" in _____ language.

Ans
- ✗ 1. Sanskrit
- ✓ 2. Arabic
- ✗ 3. Persian
- ✗ 4. Mongolian

Q.24 Which of the following diseases is caused by Rhino viruses?

Ans
- ✗ 1. Malaria
- ✗ 2. Amoebiasis
- ✓ 3. Common cold
- ✗ 4. Ascariasis

Q.25 These volcanoes are mostly made up of basalt, a type of lava that is very fluid when erupted. For this reason, these volcanoes are not steep.
Which of the following volcano is an example of the above given type of volcano?

Ans
- ✗ 1. Mount Shasta Volcano
- ✓ 2. Hawaiian Volcano
- ✗ 3. Mount Rainier Volcano
- ✗ 4. Mayon Volcano

Q.26 According to Koeppen's Scheme of climate division of India, match the following climates of India with their respective regions.

Climate	Region
1. Cold humid winter with short summer	a. Coromandel coast of Tamil Nadu
2. Hot desert	b. Arunachal Pradesh
3. Monsoon with dry summer	c. Extreme Western Rajasthan

Ans
- ✗ 1. 1-a, 2-c, 3-b
- ✗ 2. 1-b, 2-a, 3-c
- ✗ 3. 1-c, 2-b, 3-a
- ✓ 4. 1-b, 2-c, 3-a

Q.27 A provision has been inserted to empower the Assessing Officer to require a _____ for inventory valuation before tax assessment in case of appeals as per Finance Bill 2023.

Ans
- ✗ 1. secretarial audit
- ✗ 2. legal audit
- ✓ 3. cost audit
- ✗ 4. statutory audit

Q.28 What are thunderstorms in Assam during the month of 'Baisakhi' called?

Ans
- ✗ 1. Ghorisila
- ✗ 2. Kal Baisakhi
- ✗ 3. Nor Westers
- ✓ 4. Bardoisila

Q.29 NABARD came into being in 1982. With how much initial capital was it set up?

Ans
- ✓ 1. ₹100 crore
- ✗ 2. ₹200 crore
- ✗ 3. ₹50 crore
- ✗ 4. ₹150 crore

Q.30 Which field should be used when you want to send a copy of the email to someone else without the original recipient knowing?

Ans
- ✗ 1. From
- ✗ 2. CC
- ✗ 3. To
- ✓ 4. BCC

Q.31 Which of the following is NOT a former name of Lakshadweep?

Ans
- ✗ 1. Amindivi Island
- ✗ 2. Minicoy Island
- ✓ 3. Kavaratti Island
- ✗ 4. Laccadive Island

Q.32 The second five-year plan introduced to the concept of public sector of state-run enterprises based on the _____ model of industrialisation.

Ans
- ✗ 1. French
- ✗ 2. Japanese
- ✓ 3. Russian
- ✗ 4. German

Q.33 Which of the following is a rabi crop?

Ans
- ✗ 1. Watermelon
- ✗ 2. Groundnut
- ✗ 3. Maize
- ✓ 4. Wheat

Q.34 The idea of 'Fundamental Rights' was taken from the constitution of which of the following countries?

Ans
- ✗ 1. Constitution of Switzerland
- ✗ 2. Constitution of France
- ✓ 3. Constitution of the United States
- ✗ 4. Constitution of the Ireland

Q.35 Bishop is used in which of the following games?

Ans
- ✗ 1. Badminton
- ✓ 2. Chess
- ✗ 3. Billiards
- ✗ 4. Cricket

Q.36 Who was responsible for causing the partition of Bengal?

Ans
- ✗ 1. Lord Dufferin
- ✗ 2. Lord Wellesly
- ✓ 3. Lord Curzon
- ✗ 4. Lord Lytton

Q.37 The Gram Nyayalay Act was passed in the year _____.

Ans
- ✗ 1. 1992
- ✗ 2. 2006
- ✗ 3. 1996
- ✓ 4. 2008

Q.38 Pandit Shiv Kumar Sharma, a renowned instrumentalist, published which of the following books as his autobiography?

Ans
- ✗ 1. My Life My Music
- ✓ 2. Journey with a Hundred Strings: My Life in Music
- ✗ 3. Raag Mala
- ✗ 4. Yours in Music

Q.39 According the Census of India 2011, which state is the most densely populated?

Ans
- ✗ 1. Uttar Pradesh
- ✗ 2. Kerala
- ✓ 3. Bihar
- ✗ 4. Haryana

Q.40 The Central Board of Direct Taxes (CBDT) has implemented the Income-tax (25th Amendment) Rule 2021 which states that any interest accrued in a PF account for contributions of more than _____ per financial year will be taxed.

Ans
- ✗ 1. 10 lakhs
- ✓ 2. 2.5 lakhs
- ✗ 3. 7.5 lakhs
- ✗ 4. 5 lakhs

Q.41 Arjun Singh Dhurve, a Baiga folk dance teacher received the Padma Shri in 2021-22. To which state do the Baigas mainly belong?

Ans
- ✗ 1. Chhattisgarh
- ✗ 2. Maharashtra
- ✓ 3. Madhya Pradesh
- ✗ 4. Gujarat

Q.42 Identify the organism that does NOT belong to the first level trophic level.

Ans
- ✗ 1. Grass
- ✗ 2. Trees
- ✓ 3. Zooplankton
- ✗ 4. Phytoplankton

Q.43 Article 44 of the Indian Constitution is related to _____.

Ans
- ✗ 1. organisation of agriculture
- ✗ 2. living wage for workers
- ✓ 3. uniform civil code for the citizens
- ✗ 4. equal justice and free legal aid

Q.44 Manoj Sinha, who is the second Lieutenant Governor of the Union territory of Jammu and Kashmir, hails from _____.

Ans
- ✓ 1. Uttar Pradesh
- ✗ 2. Madya Pradesh
- ✗ 3. Jharkhand
- ✗ 4. Odisha

Q.45 Which Act abolished the powers so long enjoyed by the Board of Control?

Ans
- ✗ 1. Act of 1813
- ✓ 2. Act of 1858
- ✗ 3. Act of 1853
- ✗ 4. Act of 1786

Q.46 The salary and allowance of the Prime Minister of India is determined by the _____.

Ans
- ✗ 1. President of India
- ✗ 2. PMO
- ✗ 3. Cabinet Secretariat
- ✓ 4. Parliament

Q.47 Heal in India is an initiative of the Indian Government aimed at promoting _____ in the country.

Ans
- ✗ 1. spiritual enlightenment
- ✗ 2. yoga
- ✗ 3. spiritual healing
- ✓ 4. medical tourism

Q.48 In which form have earth forming materials been distributed?

Ans
- ✗ 1. Parts
- ✓ 2. Layers
- ✗ 3. Clusters
- ✗ 4. Regions

Q.49 According to Census of India 2011, how much per cent of the total population were Sikhs?

Ans
- ✗ 1. 0.4%
- ✓ 2. 1.7%
- ✗ 3. 2.3%
- ✗ 4. 0.7%

Q.50 Which iron and steel plant was established near the confluence of the rivers Subarnarekha and Kharkai?

Ans
- ✗ 1. Bokaro Steel Plant
- ✓ 2. Tata Iron and Steel Company Limited
- ✗ 3. Indian Iron and Steel Company Limited
- ✗ 4. Bhilai Steel Plant

Section : General Engineering Electrical

Q.1 A supply of 200 V can be obtained from a source of 600 V by means of a two-winding transformer or an auto transformer. The ratio of weights of conductor material in the auto transformer with respect to the two-winding transformer is _____.

Ans
- ✗ 1. 1 : 2
- ✓ 2. 1 : 1.5
- ✗ 3. 2 : 1
- ✗ 4. 1.5 : 1

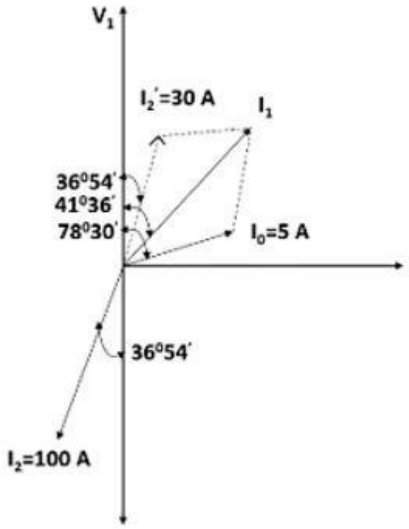
Q.2 Choose the most efficient generator for wind power generation.

Ans
- ✓ 1. Doubly-fed induction generator
- ✗ 2. Permanent magnet synchronous generator
- ✗ 3. Induction generators
- ✗ 4. Squirrel cage induction generators

Q.3 Why is the hold-on coil connected in series with the shunt field in a three-point starter of a DC motor?

Ans
- ✗ 1. To provide the lubricant for the motor
- ✗ 2. To disconnect the supply when the motor is in normal operation
- ✗ 3. To control the speed of the motor
- ✓ 4. To prevent the motor from running away in case of an open-field circuit

Q.4 Find the estimated current taken by the primary side if a single-phase transformer with a voltage ratio of 440/110 V takes a no-load current of 5 A at 0.2 power factor lagging and the secondary supplies a current of 120 A at a power factor of 0.8 lagging. Given that cos(41°36') = 0.748.



Ans
1. 30 A
2. $\sqrt{1140.4}$ A
3. $\sqrt{1149.4}$ A
4. $\sqrt{1178}$ A

Q.5 Which of the following is NOT a type of tender, depending on the type of contract?

Ans
1. Selected tender
2. Percentage rate tender
3. Lum-sum tender
4. Item rate tender

Q.6 In AC series motor, power factor is low because of _____.

Ans
1. high resistance of the field and armature circuit
2. high inductance of the field and armature circuit
3. low inductance of the field and armature circuit
4. high capacitance of the field and armature circuit

Q.7 Which expression is right about EMF equation of a transformer if f = frequency, N_1 = number of turns in primary, φ_m = maximum flux in a core, A = iron area, B_m = maximum flux density?

Ans
1. $E = 4fN_1\varphi_m A$
2. $E = 4.44fN_1\varphi_m A$
3. $E = 4.44fN_1\varphi_m$
4. $E = 4.44fN_1B_m$

Q.8 The barrier potential can be calculated by _____ (where, the symbols have their usual meaning).

Ans
1. $E_0 = (kT/q) \ln (N_D^* N_D / n_i)$
2. $E_0 = (kT/q) \ln (N_D^* N_A / n_i^2)$
3. $E_0 = (kT/q) \ln (n_i^2 / N_D^* N_A)$
4. $E_0 = (kT/q) \ln (N_A^* N_A / n_i^2)$

Q.9 Reciprocity theorem CANNOT be applied to the circuit having _____.

Ans
- ✗ 1. bilateral elements
- ✗ 2. linear elements
- ✓ 3. non-linear elements and multi -sources
- ✗ 4. only one independent sources

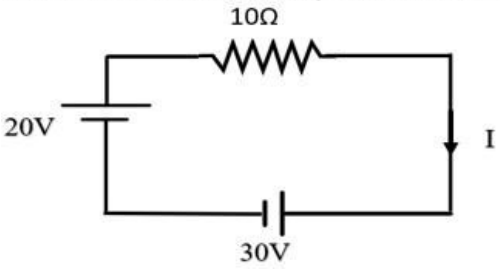
Q.10 The horizontal amplifier should be designed for _____.

Ans
- ✗ 1. low amplitude signals with a fast rise time
- ✗ 2. high amplitude signals with a fast rise time
- ✓ 3. high amplitude signals with a slow rise time
- ✗ 4. high frequency signals with a fast rise time

Q.11 With respect to measuring the current in a circuit using the CRO, which of the following statements is/are correct?
I. A low-resistance standard resistor is connected in series with the circuit whose current is being measured.
II. The CRO is connected across the standard resistor to measure the voltage drop across it.
III. A high-resistance standard resistor is connected in parallel with the circuit where the current is being measured.
IV. The CRO is connected in series with the circuit whose current is being measured.

Ans
- ✗ 1. Only IV
- ✗ 2. Only I and IV
- ✗ 3. Only III and IV
- ✓ 4. Only I and II

Q.12 In the circuit shown below, the current I in the circuit is:



Ans
- ✗ 1. 0 A
- ✗ 2. 1 A
- ✓ 3. -1 A
- ✗ 4. 2 A

Q.13 Three-point lighting is usually employed in film lighting schemes. Which of the following does NOT form a part of the scheme?

Ans
- ✓ 1. Bounce lighting
- ✗ 2. Key lighting
- ✗ 3. Back lighting
- ✗ 4. Fill lighting

Q.14 Which of the following statements is NOT correct about active power in an AC circuit?

Ans
- ✓ 1. Active power is the power dissipated in the pure inductance.
- ✗ 2. Active power is the power dissipated in the pure resistance.
- ✗ 3. Active power can be measured in terms of kilo watt.
- ✗ 4. Active power depends on power factor.

Q.15 Repulsion start induction run motors are used in applications such as _____.

Ans
- ✗ 1. fans
- ✗ 2. vacuum cleaners
- ✗ 3. hair dryers
- ✓ 4. compressors

Q.16 A 25 V, 800 W bulb is connected to a 10 V source. The power consumed by the bulb is _____.

Ans
- ✗ 1. 100 W
- ✗ 2. 64 W
- ✗ 3. 400 W
- ✓ 4. 128 W

Q.17 Which of the following statements is accurate regarding wires and cables?

Ans
- ✗ 1. Wires are made by stranding together many cables.
- ✗ 2. Wires and cables are the same thing.
- ✓ 3. Cables are made by stranding together many wires.
- ✗ 4. Wires and cables are never insulated.

Q.18 The deflecting torque in a PMMC instrument is proportional to _____.

Ans
- ✗ 1. the resistance of the coil
- ✗ 2. the area of the coil
- ✓ 3. the current flowing through the coil
- ✗ 4. the square of the current flowing through the coil

Q.19 At the leading power factor, the armature reaction of an alternator is:

Ans
- ✓ 1. partially cross magnetising and partially magnetising
- ✗ 2. partially cross magnetising and partially demagnetising
- ✗ 3. wholly magnetising
- ✗ 4. wholly demagnetising

Q.20 The standard percentage of the tender amount for the security deposit is ____.

Ans
- ✗ 1. 2.5
- ✗ 2. 5
- ✓ 3. 10
- ✗ 4. 2

Q.21 The ability of a capacitor to store charge does NOT depend on the _____.

Ans
- ✗ 1. distance between the plates
- ✗ 2. areas of the plates
- ✗ 3. nature of the insulating material
- ✓ 4. amount of charge

Q.22 A 2500 watts refrigerator works for 4 hours per day. Find the total unit of electricity used in 40 days.

Ans
- ✓ 1. 400 units
- ✗ 2. 10 units
- ✗ 3. 40 units
- ✗ 4. 400000 units

Q.23 Which law gives the direction of induced EMF?

Ans
- ✗ 1. Maxwell's law
- ✗ 2. Gauss's law
- ✓ 3. Lenz's law
- ✗ 4. Newton's law

Q.24 A switched reluctance motor can produce torque at a speed _____.

Ans
- ✓ 1. equal to synchronous speed
- ✗ 2. less than synchronous speed
- ✗ 3. double than synchronous speed
- ✗ 4. triple than synchronous speed

Q.25 What is the use of encoder in the DC servomotor?

Ans
- ✗ 1. Determines the magnetic field strength inside the motor
- ✗ 2. Determines the temperature of the windings of the motor
- ✓ 3. Determines the rotational speed of the motor
- ✗ 4. Determines the input voltage of the motor

Q.26 Which of the following is the correct interrelation between the variables x_1 and x_2 used in the expression to calculate the sag in a transmission conductor with different heights, where , variables x_1 and x_2 represent the horizontal distances of support at lower and higher levels from the lowest point of the conductor, respectively?

Ans
- ✓ 1. $x_1 < x_2$
- ✗ 2. $x_1 >> x_2$
- ✗ 3. $x_1 > x_2$
- ✗ 4. $x_1 = x_2$

Q.27 An LC circuit with inductance L = 2H and capacitance C = 8 μF is connected to an AC source. Find the value of the power factor of combination.

Ans
- ✓ 1. 0
- ✗ 2. 10
- ✗ 3. 2
- ✗ 4. 8

Q.28 For providing controlling torque to a horizontally mounted MI instrument, which of the following methods is used?

Ans
- ✗ 1. Water control
- ✓ 2. Spring control
- ✗ 3. Eddy current
- ✗ 4. Electrostatic field

Q.29 A permanent magnetic material has _____ retentivity.

Ans
- ✗ 1. low
- ✓ 2. high
- ✗ 3. zero
- ✗ 4. constant

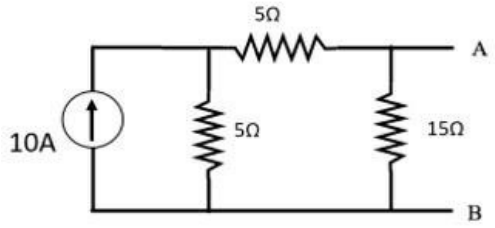
Q.30 In the context of electromagnetic induction, if the magnetic fluxes of two coils oppose each other, then the connection is called _____.

Ans
- ✗ 1. parallel opposing
- ✗ 2. mutually opposing
- ✓ 3. series opposing
- ✗ 4. self-opposing

Q.31 The wavelength of a sodium vapour lamp is _____.

Ans
- ✗ 1. 673 nm
- ✗ 2. 326 nm
- ✗ 3. 254 nm
- ✓ 4. 589 nm

Q.32 The Norton's equivalent current between the load terminal A-B will be:



Ans
- ✔ 1. 5 A
- ✘ 2. 20 A
- ✘ 3. 10 A
- ✘ 4. 0 A

Q.33 Which of the following is the correct expression for eddy current (W_e) loss if B_{max} = Maximum flux density, f = Frequency of magnetic reversal, t = Thickness of each lamination and V = Volume of the armature core?

Ans
- ✘ 1. $W_e = kB_{Max}^2 f\, t^2 V^2$ watts
- ✘ 2. $W_e = kB_{Max}^2 f^2 t^2 V^2$ watts
- ✔ 3. $W_e = kB_{Max}^2 f^2 t^2 V$ watts
- ✘ 4. $W_e = kB_{Max}^2 f^2 t V^2$ watts

Q.34 Which of the following lighting calculation methods is handy and quick?

Ans
- ✔ 1. Watts per square metre method
- ✘ 2. Point by point method
- ✘ 3. Flux method
- ✘ 4. Lumen method

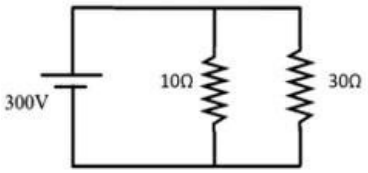
Q.35 In case of magnetic circuits, the force that tends to create magnetic flux is called _____.

Ans
- ✘ 1. absolute permeability
- ✘ 2. reluctance
- ✘ 3. relative permeability
- ✔ 4. MMF

Q.36 Which of the following connections is used as distribution transformer?

Ans
- ✔ 1. Delta-star
- ✘ 2. Star-star
- ✘ 3. Delta-delta
- ✘ 4. Star-delta

Q.37 The power consumed by the 30 Ω resistor is:



Ans
- ✘ 1. 300 W
- ✘ 2. 9000 W
- ✘ 3. 10 W
- ✔ 4. 3000 W

Q.38 Which phase of the project management lifecycle often takes the longest to wrap up?

Ans
- ✘ 1. Planning
- ✘ 2. Estimation
- ✔ 3. Execution
- ✘ 4. Conceptualisation

Q.39 In an electrical circuit, the current that changes periodically, both in magnitude and direction, at regular intervals of time is called _____.

Ans
- ✗ 1. phase current
- ✗ 2. direct current
- ✗ 3. leading current
- ✓ 4. alternating current

Q.40 What type of rotor is used in alternators driven by hydro-turbines?

Ans
- ✗ 1. Shaded pole type
- ✓ 2. Salient pole type
- ✗ 3. Non-salient pole type
- ✗ 4. Smooth cylindrical type

Q.41 Identify the correct voltage range of medium transmission line.

Ans
- ✗ 1. >100 kV < 200 KV
- ✓ 2. >20 kV < 100 kV
- ✗ 3. >1 kV < 5 kV
- ✗ 4. >5 kV < 10 kV

Q.42 In motor applications, efficiency of the motor is always less than 100% due to conversion of the _____.

Ans
- ✗ 1. output energy into current
- ✓ 2. input energy into heat
- ✗ 3. output energy into heat
- ✗ 4. input energy into voltage

Q.43 Calculate the respective values of magnetising force and flux density at a distance of 10 cm from a long circular conductor carrying a current of 100π A, placed in air?

Ans
- ✗ 1. $6.28 \times 10^{-7} \text{AT/m}$ and 500 Wb/m^2
- ✗ 2. 1500 Wb/m^2 and $3.14 \times 10^{-4} \text{AT/m}$
- ✓ 3. 500 AT/m and $6.28 \times 10^{-4} \text{Wb/m}^2$
- ✗ 4. 50 Wb/m^2 and $6.28 \times 10^{-7} \text{AT/m}$

Q.44 A coal-fired thermal power plant generates 750 MW of electricity with a thermal efficiency of 30%. The coal has a heating value of 30,000 kJ/kg. Find the mass flow rate of the coal required to generate the required electricity.

Ans
- ✗ 1. 0.833 kg/s
- ✓ 2. 83.33 kg/s
- ✗ 3. 8.33 kg/s
- ✗ 4. 0.0833 kg/s

Q.45 The transfer characteristic of JFET is drawn between:

Ans
- ✗ 1. I_{DSS} and V_{DS}
- ✗ 2. I_B and V_{DS}
- ✗ 3. I_B and V_{GS}
- ✓ 4. I_{DSS} and V_{GS}

Q.46 Consider two MOSFET's A and B with the same overdrive voltage and sizes. MOSFET A is p-type MOSFET while MOSFET B is n-type MOSFET. Which of the following statements is true?
a) MOSFET A has a higher transconductance
b) MOSFET B has a higher transconductance
c) MOSFET A and B have same transconductance due to same dimensions
d) MOSFET A has a higher transconductance due to less mobility

Ans
✗ 1. Only C
✗ 2. Only A and D
✓ 3. Only B
✗ 4. Only A

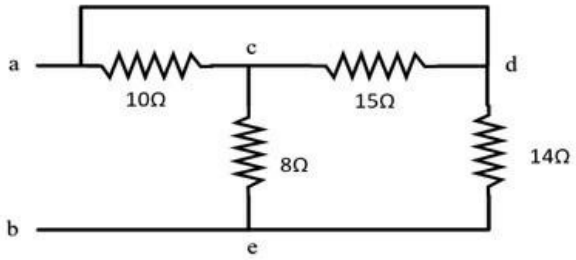
Q.47 Which of the following types of steel is used to make the core of a transformer?

Ans
✗ 1. Stainless steel
✓ 2. Silicon steel
✗ 3. High-carbon steel
✗ 4. Tool steel

Q.48 Which of the following should NOT be prioritised when making a comparison statement for the tender evaluation sheet/format?

Ans
✗ 1. Cost of packaging and shipping
✗ 2. Confidence that faulty goods will be replaced
✗ 3. Conditions of supply
✓ 4. Supplier's name

Q.49 Find the equivalent resistance across terminal a-b:



Ans
✗ 1. 20Ω
✗ 2. 14Ω
✓ 3. 7Ω
✗ 4. 28Ω

Q.50 The following test results were obtained from a 6 kVA, 200/400 V, 50 Hz single-phase transformer: Data for no-load low-voltage side: 200 V, 0.5 A and 50 W. At normal voltage and frequency, determine the magnetising current of the transformer.

Ans
✗ 1. 0 A
✓ 2. 0.433 A
✗ 3. 0.569 A
✗ 4. 0.236 A

Q.51 In electromagnetic induction, the energy is supplied to the circuit and a part of this supplied energy is spent to meet ____.

Ans
✗ 1. hysteresis loss
✗ 2. iron losses
✗ 3. eddy current loss
✓ 4. I^2R losses

Q.52 Which of the following statements is true about selection of the size of units in electrical energy generation?

Ans
✓ 1. The size should be selected such that the unit operates close to the load curve of the station.
✗ 2. The size should be selected independent of both the maximum demand curve and the load curve.
✗ 3. The size must be selected such that the unit operates close to the maximum demand curve of the station.
✗ 4. The size of units must match both the maximum demand curve and the load curve.

Q.53 Which of the following is true regarding reciprocity theorem?

Ans
- ✓ 1. The ratio of the response to the excitation remains the same.
- ✗ 2. The sum of response and the excitation remains the same.
- ✗ 3. The difference between response and excitation remains the same.
- ✗ 4. The product of response and excitation remains the same.

Q.54 Which of the following is NOT a desirable property for the insulating materials used in an underground cable?

Ans
- ✗ 1. High insulation resistance
- ✗ 2. Non-inflammable
- ✓ 3. Hygroscopic
- ✗ 4. High dielectric strength

Q.55 If V-I characteristics is plotted for forward current by increasing the temperature, it has been seen that plot for V-I characteristics _____ as temperature increases.

Ans
- ✗ 1. does not change
- ✓ 2. is moved to the left
- ✗ 3. is moved down
- ✗ 4. is moved to the right

Q.56 A balanced star connected load of 4 + j3 Ω per phase connected to a 3-phase, 230 V (phase value) supply. Find the value of active power.

Ans
- ✓ 1. 25.4 kW
- ✗ 2. 19.13 kW
- ✗ 3. 22.45 kW
- ✗ 4. 15.34 kW

Q.57 In a pure inductive circuit, if the frequency of the AC source is doubled, then its inductive reactance will:

Ans
- ✗ 1. remain the same
- ✗ 2. be halved
- ✗ 3. become zero
- ✓ 4. be doubled

Q.58 For measuring the earth resistance by the fall-of-potential method, how many auxiliary electrodes are used?

Ans
- ✓ 1. 2
- ✗ 2. 1
- ✗ 3. 3
- ✗ 4. 4

Q.59 For an ideal short transmission line with zero voltage regulation, if receiving end voltage is 150 kV, then the sending end voltage will be:

Ans
- ✓ 1. 150 kV
- ✗ 2. 125 kV
- ✗ 3. 200 kV
- ✗ 4. 300 kV

Q.60 If the frequency of supply in a three core underground cable is doubled, the charging current will be _____.

Ans
- ✗ 1. four times
- ✗ 2. half
- ✓ 3. double
- ✗ 4. three times

Q.61 What is the function of the phosphor-coated screen in a CRT?

Ans
- ✗ 1. It is the part that moves the direction of the electron beam
- ✗ 2. It is the part that generates a beam of electrons
- ✗ 3. It is the part that regulates the intensity of the electron beam
- ✓ 4. It is the part that emits light

Q.62 Consider the following statements about the working of a hysteresis motor and choose the suitable combination of correct choices.
a. The stator of the hysteresis motor has a main winding along with an auxiliary winding.
b. When the stator winding is fed from a single phase supply, it produces a synchronously revolving magnetic field.
c. The rotor material has low retentivity so hysteresis loss is low.
d. The rotor of the hysteresis motor consists of a smooth cylinder of magnetically hard steel, without winding

Ans
- ✗ 1. Only b, c and d are correct.
- ✓ 2. Only a, b and d are correct.
- ✗ 3. Only d is correct.
- ✗ 4. Only c is correct.

Q.63 Which of the following is NOT an advantage of shell type transformers over core type transformers?

Ans
- ✗ 1. Less copper requirement
- ✓ 2. Easy maintenance
- ✗ 3. Reduced loss
- ✗ 4. High mechanical strength

Q.64 The deflection sensitivity in a cathode ray oscilloscope (CRO) is _____ the mass of electron.

Ans
- ✗ 1. inversely proportional to
- ✗ 2. directly proportional to
- ✗ 3. directly proportional to the square root of
- ✓ 4. inversely proportional to the square root of

Q.65 The load on the transformer changes every day, with a daily production of 120 kWh and a cumulative loss of 5 kWh. What is the all-day efficiency of the transformer?

Ans
- ✓ 1. 96%
- ✗ 2. 95%
- ✗ 3. 92%
- ✗ 4. 90%

Q.66 Calculate the apparent power of a circuit if the circuit has a power factor of 0.8 and the active power of the circuit is 40 W.

Ans
- ✗ 1. 100 VA
- ✗ 2. 40 VA
- ✗ 3. 75 VA
- ✓ 4. 50 VA

Q.67 In the split-phase induction motor, both main winding and starting winding are displaced _____ in space.

Ans
- ✗ 1. 180 degrees
- ✗ 2. 270 degrees
- ✓ 3. 90 degrees
- ✗ 4. 360 degrees

Q.68 In an electrical signal waveform, if each value on the curve is proportional to sine of the angle of rotation of the coil, then such a wave is called _____.

Ans
- ✗ 1. ramp wave
- ✗ 2. square wave
- ✓ 3. sine wave
- ✗ 4. triangular wave

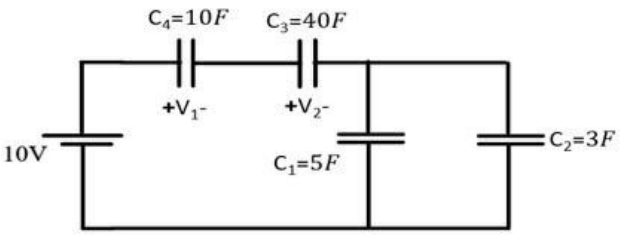
Q.69 If a power station supplies 1000 MWh of electricity to its consumers for a period of two months, then the average demand during the period will be:

Ans
- ✗ 1. 1.39 MW
- ✗ 2. 1.39 kW
- ✓ 3. 0.694 MW
- ✗ 4. 0.694 kW

Q.70 If the synchronous speed of a motor is 1000 rpm and the rotor speed is 970 rpm, then percentage slip is _____.

Ans
✓ 1. 3%
✗ 2. 7%
✗ 3. 5%
✗ 4. 9%

Q.71 For the circuit shown below, the voltage across 10F and 40 F capacitors are:



Ans
✗ 1. 10 V and 40 V, respectively
✗ 2. 400 V and 1600 V, respectively
✓ 3. 4 V and 1 V, respectively
✗ 4. 1V and 4 V, respectively

Q.72 A voltage of 230∠ 60° is applied to a current offering an impedance of 10 + j10 Ω. Find the expression for the current flowing through the circuit in polar form.

Ans
✗ 1. $23\angle 45^{\circ}$ leading
✗ 2. $16.3\angle 15^{\circ}$ lagging
✓ 3. $16.3\angle 15^{\circ}$ leading
✗ 4. $23\angle 45^{\circ}$ lagging

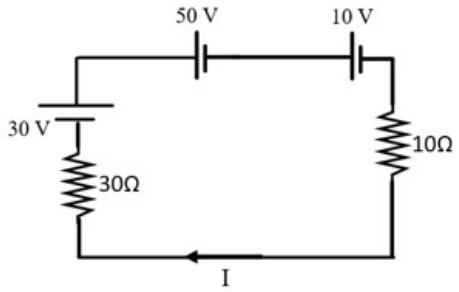
Q.73 The height between the two supports of a transmission and distribution overhead line can be determined as:

Ans
✗ 1. $\frac{1}{2}\times$ (Vertical distance between the lower height support point of the conductor and lowest point of the conductor)
✗ 2. (Vertical distance between the lower height support point of the conductor and Lowest point of the conductor) + (Vertical distance between the higher height support point of the conductor and lowest point of the conductor)
✗ 3. $\frac{1}{2}\times$ (Vertical distance between the higher height support point of the conductor and lowest point of the conductor)
✓ 4. (Vertical distance between the higher height support point of the conductor and Lowest point of the conductor) − (Vertical distance between the lower height support point of the conductor and lowest point of the conductor)

Q.74 In an electronic circuit, the potential difference across any one resistor is a fraction of the total voltage applied across the series combination. Such a circuit is called _____.

Ans
✗ 1. current divider circuit
✗ 2. current multiplier circuit
✓ 3. voltage divider circuit
✗ 4. voltage multiplier circuit

Q.75 The value of the current I in the circuit is _____.



Ans
- ✓ 1. -0.75 A
- ✗ 2. 0.75 A
- ✗ 3. 2.25 A
- ✗ 4. -2.25 A

Q.76 **The advantage of the stationary armature of a synchronous machine is:**

Ans
- ✗ 1. stator weight is less compared to rotor weight
- ✓ 2. perfect mechanical balance is obtained on stator winding
- ✗ 3. stator winding voltage rating can be decreased
- ✗ 4. commutator is present

Q.77 **Which of the following statements accurately describes voltage drop due to armature leakage reactance in an alternator on load?**

Ans
- ✗ 1. The voltage drop due to armature leakage reactance decreases with increasing load.
- ✓ 2. The voltage drop due to armature leakage reactance increases with increasing load.
- ✗ 3. The voltage drop due to armature leakage reactance is independent of the load.
- ✗ 4. The voltage drop due to armature leakage reactance only occurs when the alternator is operating at no load.

Q.78 **In case of thermal efficiency, by using which of the following relations can 1 KWh of electrical energy be converted into joules?**

Ans
- ✓ 1. $1\text{kWh} = 36\times10^5\,\text{joules}$
- ✗ 2. $1\text{kWh} = 3.6\times10^3\,\text{joules}$
- ✗ 3. $1\text{kWh} = 3.6\times10^5\,\text{joules}$
- ✗ 4. $1\text{kWh} = 36\times10^6\,\text{joules}$

Q.79 **Which of the following overhead conductor materials is preferred for the harmful gas (like ammonia) atmosphere?**

Ans
- ✗ 1. Galvanized steel
- ✗ 2. Cadmium copper
- ✓ 3. Phosphor bronze
- ✗ 4. Aluminium

Q.80 **During working of a permanent magnet synchronous motor, _____.**

Ans
- ✗ 1. stator and rotor both produce rotating magnetic field
- ✗ 2. rotor produces rotating magnetic field and stator produces constant magnetic field
- ✗ 3. stator and rotor both produce constant magnetic field
- ✓ 4. rotor produces constant magnetic field and stator produces rotating magnetic field

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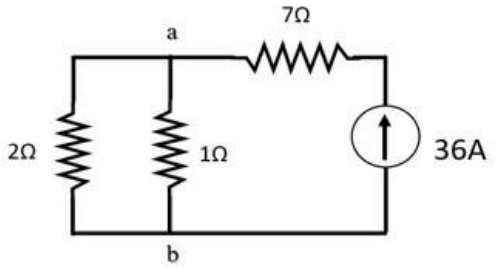
Q.81 The current through the 2Ω resistor is:



Ans
- ✗ 1. 1A from a to b
- ✗ 2. 10A from b to a
- ✓ 3. 12A from a to b
- ✗ 4. 25A from b to a

Q.82 The split-phase induction motor is NOT used for drives that require more than _____.

Ans
- ✗ 1. 1000 KW
- ✗ 2. 100 KW
- ✗ 3. 10 KW
- ✓ 4. 1 KW

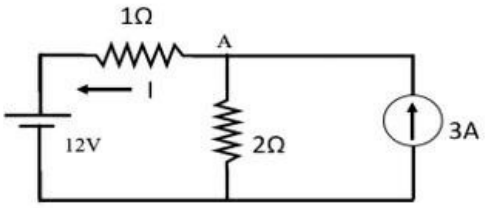
Q.83 For an AC circuit, the voltage and the current are given as V = (100 + j10) V and I = (20 − j10) A, respectively. The active power of the circuit is:

Ans
- ✗ 1. P = 1800 W
- ✗ 2. P = 1000 W
- ✓ 3. P = 1900 W
- ✗ 4. P = 1500 W

Q.84 Which of the following is a ferromagnetic material?

Ans
- ✗ 1. Water
- ✗ 2. Oxygen
- ✓ 3. Nickel
- ✗ 4. Gold

Q.85 In the circuit shown below, the value of the current I is _____.



Ans
- ✓ 1. -2 A
- ✗ 2. 4 A
- ✗ 3. 0 A
- ✗ 4. 2 A

Q.86 The change in current through a junction diode is 1.5 mA when the forward bias voltage is changed by 0.6 V. The dynamic resistance is _____.

Ans
- ✗ 1. 600 Ω
- ✗ 2. 500 Ω
- ✓ 3. 400 Ω
- ✗ 4. 300 Ω

Q.87 A substation is a facility that transmits and distributes electricity. It serves as an intermediary between electricity plants and end users. Which of the following statements about substations is INCORRECT?

Ans
- ✗ 1. Rotary converters are also used in railway substations.
- ✓ 2. Domestic consumers may also connect directly to the main transmission network.
- ✗ 3. All of the options
- ✗ 4. At the point of interconnection between two distinct transmission voltages, transformers may be installed in a substation.

Q.88 In an electrical network, if the quantity of a source is controlled by another voltage or current present in the circuit, such a source is called _____.

Ans
- ✗ 1. ideal source
- ✓ 2. dependent source
- ✗ 3. non-ideal source
- ✗ 4. independent source

Q.89 What is the main reason of placing field winding on the stationary rotor?

Ans
- ✓ 1. Insulation of high voltage is made easy on stator than on rotor.
- ✗ 2. Stator is associated with more power.
- ✗ 3. Stator is associated with more current.
- ✗ 4. Field circuit possesses less power.

Q.90 The electrical pressure measured between any two points in an electrical circuit is called _____.

Ans
- ✗ 1. work done
- ✗ 2. energy
- ✓ 3. voltage
- ✗ 4. resistivity

Q.91 In a capacitor-start capacitor-run induction motor, under standstill condition forward and backward voltages are _____.

Ans
- ✗ 1. infinite
- ✗ 2. unequal in magnitude
- ✗ 3. zero
- ✓ 4. equal in magnitude

Q.92 Which of the following statements is/are correct regarding black liquor?
A) It retains more than 50% of the biomass energy of wood.
B) It is a non-toxic substance produced when wood is burned into paper.
C) Tall oil is an important by-product separated from black liquor by skimming.

Ans
- ✗ 1. B and C
- ✓ 2. A and C
- ✗ 3. Only C
- ✗ 4. A and B

Q.93 Which of the following statements is FALSE in association with synchronous motor applications?

Ans
- ✗ 1. Synchronous motor is used in constant load drive application.
- ✗ 2. Voltage regulation can be done using synchronous motor.
- ✗ 3. Synchronous motor is expensive in low power output application.
- ✓ 4. Synchronous motor is highly suitable for low power output below 40 kW in medium speed range.

Q.94 Which of the following statements is NOT correct about the significance of stationary armature alternator?

Ans
- ✗ 1. The rotating field type alternator has a smaller size than the rotating armature type.
- ✗ 2. The armature windings of the rotating field alternator are not subjected to centrifugal forces.
- ✓ 3. The output current can be easily taken from rotor winding.
- ✗ 4. The armature windings can be braced better mechanically against the high electromagnetic force.

Q.95 The actual efficiency of a solar power plant is lower than its theoretical efficiency. Which of the following can be reasons for this?

I) Recombination of electrons and holes
II) Internal resistance of the cell

Ans
- ✗ 1. Neither I nor II
- ✗ 2. Only I
- ✓ 3. Both I and II
- ✗ 4. Only II

Q.96 Find the electrical energy consumed in 10Ω resistance when 100 mA current flows for 2 minutes.

Ans
- ✗ 1. 100 J
- ✗ 2. 1200 J
- ✓ 3. 12 J
- ✗ 4. 120 J

Q.97 In BJT, for common emitter configuration, the input characteristics are represented by a plot between which of the following parameters?

Ans
- ✗ 1. V_{EE} and I_B
- ✗ 2. V_{CE} and I_C
- ✓ 3. V_{BE} and I_B
- ✗ 4. V_{BE} and I_E

Q.98 A rectifier type instrument uses a bridge rectifier and has its scale calibrated in terms of rms value of a sine wave. It indicates a voltage of 3.33 V when measuring a voltage of a triangular wave shape. Calculate the peak value of the applied voltage?

Ans
- ✗ 1. 6.66 Volts
- ✗ 2. 9 Volts
- ✓ 3. 6 Volts
- ✗ 4. 9.99 Volts

Q.99 The phasing out test on a three-phase transformer is carried out to find _____.

Ans
- ✗ 1. primary winding belonging to the same phase
- ✗ 2. primary and secondary windings belonging to a different phase
- ✓ 3. primary and secondary windings belonging to the same phase
- ✗ 4. secondary winding belonging to a different phase

Q.100 The admittance of an electric circuit is represented by Y = (3 + j4). What is the value of resistance in this circuit?

Ans
- ✗ 1. $\frac{4}{25}\Omega$
- ✗ 2. $\frac{2}{25}\Omega$
- ✓ 3. $\frac{3}{25}\Omega$
- ✗ 4. $\frac{1}{25}\Omega$