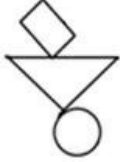


Junior Engineer Civil Mechanical and Electrical Examination 2023 Paper I

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|-----------|---|
| Exam Date | 10/10/2023 |
| Exam Time | 1:00 PM - 3:00 PM |
| Subject | Junior Engineer 2023 Electrical Paper I |

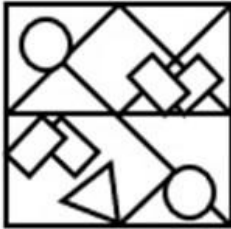
Section : General Intelligence and Reasoning

Q.1 Select the option in which the given figure is embedded (rotation is NOT allowed).

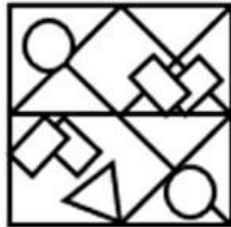


Ans

1.



2.



3.



4.



Q.2 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)

Flock : Many :: Solitary : ?

Ans

✓ 1. Alone



2. Last



3. Happy



4. Lost

Q.3 Which of the following numbers will replace the question marks (?) in the given series?
4, 17, 34, 53, ?, 105, 136, ?

Ans

✗ 1. 84, 190



2. 76, 173



3. 78, 177

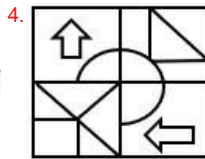
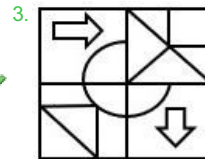
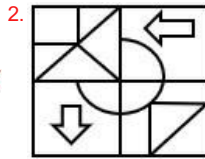
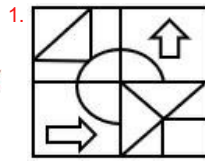


4. 79, 184

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



Ans



Q.5 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. Eg., 13 – Operations on 13 such as adding/subtracting/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)

(5, 9, 27)

(9, 15, 47)

Ans 1. (14, 9, 54)

2. (18, 5, 45)

3. (13, 7, 38)

4. (6, 11, 35)

Q.6 Select the option that represents the correct order of the given words as they would appear in an English dictionary.

1. Kindle
2. Knob
3. Kite
4. Knife
5. Kindergarten

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

2. 5, 3, 1, 4, 2

3. 5, 1, 3, 2, 4

4. 1, 5, 3, 4, 2

Q.7 Which letter-cluster will replace the question mark (?) to complete the given series?

GZIM, HBFI, ?, JFZA, KHWV

Ans 1. IRTY

2. IKBW

3. IDCE

4. ICTZ

Q.8 Select the option that represents the correct order of the given words as they would appear in an English dictionary.

1. Opaque
2. Omission
3. Once
4. Onward
5. Omnipotence

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

Q.9 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:

Some apartments are bungalows.
Some bungalows are flats.

Conclusions:

- I. Some apartments are flats.
- II. Some flats are bungalows.

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

Q.10 Arrange the following words in a logical and meaningful order.

1. millimetre
2. inch
3. centimetre
4. foot
5. metre

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

Q.11 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)

Idea : Notion :: Vacant : ?

Ans ☒ 1. Enriched
☒ 2. Full
☒ 3. Empty
☒ 4. Squander

Q.12 Select the number from among the given options that can replace the question mark (?) in the following series.

4, 17, 39, 69, 117, 181, ?, 387

Ans ☒ 1. 222
☒ 2. 272
☒ 3. 227
☒ 4. 277

Q.13 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.)

Fan : Breeze

Ans ☒ 1. Stove : Fire

☒ 2. Food : Hunger

☒ 3. Glass : Bowl

☒ 4. Bottle : Water

Q.14 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?

7 : 18 :: ? : 30 :: 10 : 24

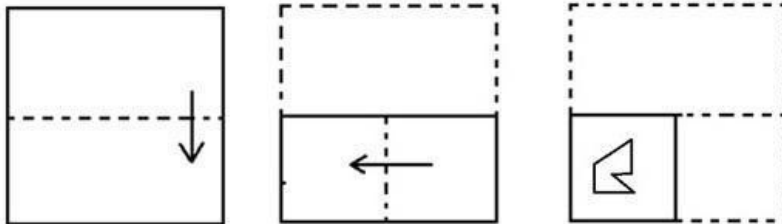
Ans ☒ 1. 13

☒ 2. 10

☒ 3. 28

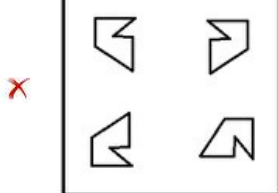
☒ 4. 18

Q.15 The sequence of folding a piece of paper and the manner in which the folded paper has been cut is shown below. Choose a figure which would most closely resemble the unfolded form of the paper.

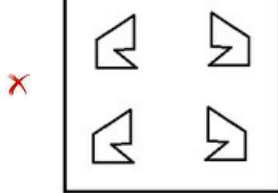


Ans

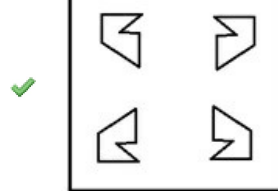
1.



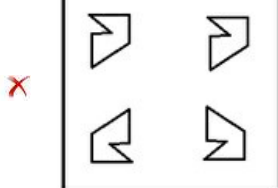
2.



3.



4.



Q.16 Six friends are sitting in a circle. All of them are facing the centre. Palak is an immediate neighbour of Kumud. Jhalak sits third to the left of Mehak. Rahat sits fourth to the right of Jhalak. Kumud sits second to the right of Chahak.

Who sits to the immediate left of Mehak?

- Ans
- ☐ 1. Kumud
 - ☒ 2. Palak
 - ☐ 3. Rahat
 - ☐ 4. Chahak

Q.17 'Q + R' means 'Q is the husband of R',
'Q - R' means 'Q is the father of R',
'Q * R' means 'Q is the mother of R', and
'Q @ R' means 'Q is the daughter of R'.
If $M + V @ P - U$, how is M related to U?

- Ans
- ☐ 1. Father's brother
 - ☒ 2. Sister's husband
 - ☐ 3. Brother
 - ☐ 4. Father

Q.18 Three statements are given followed by three conclusions numbered I, II and III. 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 goods are services.

Some services are applications.

All applications are forms.

Conclusions:

I. All goods can never be applications.

II. At least some services are forms.

III. No good is a form.

- Ans
- ☐ 1. Only II and III follow
 - ☐ 2. Only I follows
 - ☐ 3. None follows
 - ☒ 4. Only II follows

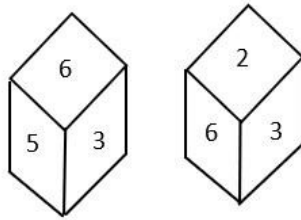
Q.19 Seven friends Swami, Lav, Akhil, Arun, Shubh, Vivek and Gyan, each has different ages. Akhil is older than only two people. Lav is older than Swami. Vivek is older than only three people. Swami is younger than only two people. Gyan is neither the eldest nor the youngest. Lav is older than Vivek but not older than Shubh. Who is the youngest?

- Ans
- ☐ 1. Gyan
 - ☐ 2. Akhil
 - ☐ 3. Shubh
 - ☒ 4. Arun

Q.20 Select the correct combination of mathematical signs to sequentially replace the * signs and balance the given equation.
 $15 * 4 * 5 * 2 * 10 = 20$

- Ans
- ☐ 1. $+ \times - +$
 - ☐ 2. $+ - + \times$
 - ☒ 3. $\times \div - +$
 - ☐ 4. $+ + + \times$

Q21 Two different positions of the same dice are shown. Find the number on the top if it is resting on '2'.



- Ans
- ☐ 1. 1
 - ☐ 2. 3
 - ☒ 3. 5
 - ☐ 4. 4

Q22 Ravina departs from her home and walks 55 m towards the east. She then turns right and walks 24 m. She turns right again and walks 68 m. She takes a final left turn and walks 16 m. How far is she from a pole which is exactly 40 m to the south of her home?
(Assume that all the turns are 90° turns only.)

- Ans
- ☐ 1. 44 m
 - ☒ 2. 13 m
 - ☐ 3. 33 m
 - ☐ 4. 27 m

Q23 In a certain code language, 'BOOTS' is coded as '64', and 'SHOES' is coded as '69'. How will 'HEELS' be coded in that language?

- Ans
- ☐ 1. 74
 - ☐ 2. 64
 - ☒ 3. 86
 - ☐ 4. 78

Q24 P, Q, R, S, T, U, V, and W are sitting around a square table facing the centre. Some of them are sitting at the corners while some are sitting at the exact centre of the sides. P is sitting to the immediate left of W and immediate right of U. S is sitting to the immediate left of U and immediate right of T. T is sitting to the immediate right of R. V is sitting between R and Q. Who is sitting between P and Q counting from the right of P?

- Ans
- ☐ 1. S
 - ☐ 2. T
 - ☐ 3. R
 - ☒ 4. W

Q25 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/consonants/vowels in the word).
Wood : Carve :: Clay : _____

- Ans
- ☐ 1. Mud
 - ☐ 2. Soil
 - ☒ 3. Mould
 - ☐ 4. Dirt

Q26 Select the correct option that indicates the arrangement of the following words in a logical and meaningful order.

1. World
2. India
3. Bangalore
4. Asia
5. Karnataka

- Ans
- ☒ 1. 35241
 - ☐ 2. 35412
 - ☐ 3. 14235
 - ☐ 4. 21435

Q.27 Which of the following numbers will replace the question mark (?) in the given series?
11, 75, 131, 179, 219, ?

- Ans ☐ 1. 243
☐ 2. 237
☐ 3. 233
☒ 4. 251

Q.28 Select the option that represents the letters that, when placed from left to right in the blanks below, will complete the letter series.

_ A _ D _ A D A A _ A A D _ A

- Ans ☐ 1. A D D A D
☐ 2. A D A A D
☐ 3. D A D A A
☒ 4. D A A D A

Q.29 Which letter-cluster will replace the question mark (?) to complete the given series?

P J V G, V B Z B, B T D W, H L H R, ?

- Ans ☐ 1. M D L M
☐ 2. N D L N
☐ 3. M D L N
☒ 4. N D L M

Q.30 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)

Peasant : Cottage :: Monk : ?

- Ans ☐ 1. Religious
☐ 2. Nun
☒ 3. Monastery
☐ 4. Palace

Q.31 Select the option that represents the letters that, when sequentially placed from left to right in the blanks below, will complete the letter series.

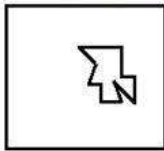
Z _ _ M I _ C B _ I Z C _ M _ Z C _ _ I

- Ans ☐ 1. C B Z B I M B M
☐ 2. C B Z I B M B M
☒ 3. C B Z M B I B M
☐ 4. C B Z B M I B M

Q.32 In a certain code language, 'SMOKE' is coded as 25 and 'BROWSER' is coded as 49. How will 'ADULTHOOD' be coded in that language?

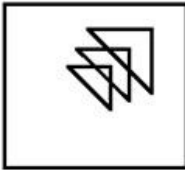
- Ans ☐ 1. 78
☐ 2. 64
☒ 3. 81
☐ 4. 100

Q33 Select the option in which the given figure is embedded (rotation is NOT allowed).

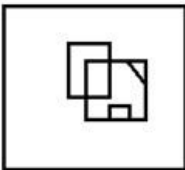


Ans

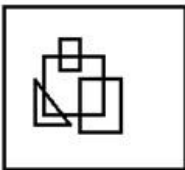
1.



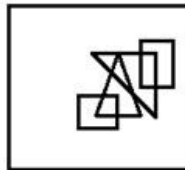
2.



3.



4.



Q34 Point A is 26 m to the south of Point B. Point C is 13 m to the east of Point B. Point C is 39 m to the north of Point D. Point D is 14 m to the west of Point E. Point F is 13 m to the north of Point E. Point G is 40 m to the west of Point F. Point H is to the north of Point G and also to the west of Point C. In which direction is Point H with respect to Point F?

Ans

1. North

2. North-west

3. North-east

4. West

Q35 In a certain code language, 'BORDER' is coded as ESUHHV and 'GLOBAL' is coded as JPRFDP. How will 'LATEST' be coded in that language?

Ans

1. OEXJWY

2. PEWJVX

3. PEWUW

4. OEWVX

Q.36 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.)
Poultry : Turkey

- Ans ☒ 1. Chicken : Meat
☒ 2. Vegetable : Spinach
☒ 3. Spinach : Green
☒ 4. Apple : Banana

Q.37 Which two signs should be interchanged to make the given equation correct?
 $167 + 85 - 5 \times 4 \div 36 = 199$

- Ans ☒ 1. \div and $-$
☒ 2. $+$ and \times
☒ 3. \times and $+$
☒ 4. $-$ and \times

Q.38 In a certain code language, 'RIGHT' is coded as '87', and 'LEFT' is coded as '59'. How will 'CENTRE' be coded in that language?

- Ans ☒ 1. 28
☒ 2. 90
☒ 3. 101
☒ 4. 110

Q.39 Select the correct mirror image of the given figure when the mirror is placed at MN as shown below.



- Ans ☒ 1. $\overline{p\ 2\ 7\ e\ 8\ b}$
☒ 2. $\overline{b\ 2\ 4\ e\ g\ 9}$
☒ 3. $\overline{b\ 5\ 4\ e\ g\ P}$
☒ 4. $\overline{d\ 2\ 4\ e\ g\ 9}$

Q.40 Select the correct combination of mathematical signs to replace “%” which balances the following equation.
 $64 \% 8 \% 3 \% 6 \% 4 \% 8 \% 2$

- Ans ☒ 1. $\div, \times, +, =, -, +$
☒ 2. $\times, +, =, -, +, \times$
☒ 3. $+, \times, =, -, +, +$
☒ 4. $\div, \times, +, =, \times, -$

Q.41 If '+' means '-', '-' means ' \times ', ' \times ' means ' \div ', ' \div ' means '+', then what will be the correct answer of the following relation?
 $(6 - 20 \div 24) \times 8 + 6 = ?$

- Ans ☒ 1. 12
☒ 2. 16
☒ 3. 17
☒ 4. 15

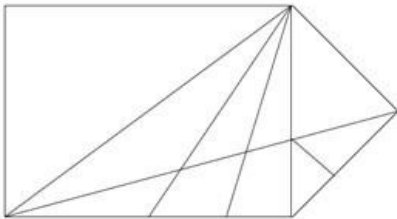
Q42 Select the figure from the options that can replace the question mark (?) and complete the given pattern.



Ans

1. ☒
2. ☐
3. ☐
4. ☐

Q43 How many triangles are there in the given figure?



Ans

1. 27 ☐
2. 24 ☐
3. 25 ☒
4. 23 ☐

Q44 R is son of P. Q is mother of N. M is husband of N. M is R's sister's husband. If O is the son of N, then how is P related to O?

Ans

1. Father's brother ☐
2. Son's son ☐
3. Mother's father ☒
4. Father's father ☐

Q45 Select the set in which the numbers are related in the same way as are the numbers of the given set.

(NOTE: Operations should be performed on the whole numbers, without breaking down the numbers into its constituent digits. Eg. 13 – Operations on 13 such as adding /subtracting/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.)

(4, 13, 5)
(2, 13, 9)

Ans

1. (5, 19, 9) ☒
2. (5, 71, 9) ☐
3. (5, 17, 9) ☐
4. (5, 91, 9) ☐

Q46 Select the option that is related to the fifth term in the same way as the second term is related to the first term and the fourth term is related to the third term.

9 : 99 :: 12 : 168 :: 15 : ?

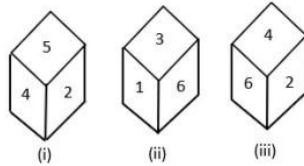
Ans

1. 205 ☐
2. 250 ☐
3. 225 ☐
4. 255 ☒

Q47 Select the option that represents the letters which, when sequentially placed from left to right in the blanks below, will complete the letter series
Q _ R _ _ _ U R _ A _ _ R L A

- Ans ☒ 1. QLUQLAU
☒ 2. ULAQLQU
☒ 3. RALQLAQ
☒ 4. ALQUQLU

Q48 Three different positions of the same dice are shown. Find the number on the face opposite the face showing '6'



- Ans ☒ 1. 3
☒ 2. 2
☒ 3. 5
☒ 4. 4

Q49 Select the correct mirror image of the given combination when the mirror is placed at 'PQ' as shown.



- Ans ☒ 1. U A T E Y P
☒ 2. U A T E Y P
☒ 3. U A T E Y P
☒ 4. U A T E Y P

Q50 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.

12 : 156 :: ? : 240 :: 22 : 506

- Ans ☒ 1. 16
☒ 2. 14
☒ 3. 17
☒ 4. 15

Section : General Awareness

Q1 Vaijayantimala, a famous Indian actress, was also an exponent of which of the following dance forms?

- Ans ☒ 1. Kathak
☒ 2. Bharatanatyam
☒ 3. Kuchipudi
☒ 4. Odissi

Q2 Which of the following statements is INCORRECT with respect to Start-Up India Seed Fund Scheme?

- Ans ☒ 1. It is being implemented by the Ministry of Commerce and Industry.
☒ 2. It was launched in 2021.
☒ 3. ₹845 crore will be provided as seed fund.
☒ 4. The number of estimated beneficiaries are 3,600 start-ups through 300 incubators.

Q3 Which semi-essential amino acid plays an important role in your body's immune function, digestion, sleep and sexual function?

- Ans ☒ 1. Leucine
☒ 2. Valine
☒ 3. Arginine
☒ 4. Histidine

Q.4 The headquarters of National Aluminium Company Limited (NALCO) is located at _____.

- Ans
- ☐ 1. Chennai
 - ☐ 2. Bhopal
 - ☒ 3. Bhubaneswar
 - ☐ 4. Jaipur
-

Q.5 Which of the following is NOT a transition metal?

- Ans
- ☐ 1. Cu
 - ☐ 2. Co
 - ☒ 3. Mg
 - ☐ 4. Ni
-

Q.6 The Reserve Bank of India introduced a comprehensive regulatory framework for NBFC-MFI on _____.

- Ans
- ☒ 1. 2 December 2011
 - ☐ 2. 5 December 2012
 - ☐ 3. 10 December 2015
 - ☐ 4. 8 December 2013
-

Q.7 On which date did the members of the Constituent Assembly append their signatures to the Constitution of India?

- Ans
- ☒ 1. 24 January 1950
 - ☐ 2. 25 January 1950
 - ☐ 3. 22 January 1950
 - ☐ 4. 23 January 1950
-

Q.8 In organic chemistry, which qualitative method is used for testing an unsaturated carbon-carbon bond, such as an alkene or alkyne, but NOT for an aromatic carbon-carbon bond?

- Ans
- ☐ 1. Lucas test
 - ☐ 2. Iodoform test
 - ☒ 3. Bayer's test
 - ☐ 4. Phthalein dye test
-

Q.9 Who among the following members participate in the election of the Vice President of India?

- Ans
- ☒ 1. Elected and nominated members of the Parliament
 - ☐ 2. Legislative members of all States and Union Territories
 - ☐ 3. Elected members of the Parliament
 - ☐ 4. Legislative assembly members of all States
-

Q.10 According to the Census of India 2011, what is the literacy rate of the state of Bihar?

- Ans
- ☐ 1. 63.6%
 - ☐ 2. 62.4%
 - ☒ 3. 61.8%
 - ☐ 4. 65.7%
-

Q.11 In which year was the climate classification first published in Russian as 'thermal zones of the earth'?

- Ans
- ☐ 1. 1991
 - ☐ 2. 1890
 - ☐ 3. 1895
 - ☒ 4. 1884
-

Q.12 How do web browsers use Hyperlinks?

- Ans
- ☐ 1. To store passwords securely
 - ☐ 2. To display advertisements on websites
 - ☒ 3. To navigate between web pages and resources
 - ☐ 4. To analyse internet traffic patterns
-

Q.13 The steppe biome is a dry, grassland habitat found on all continents EXCEPT, Australia and Antarctica. In which climate does it mainly occur?

- Ans
- ☐ 1. Alpine climates
 - ☒ 2. Temperate climates
 - ☐ 3. Tropical climates
 - ☐ 4. Continental climates

Q.14 Sangeet Natak Akademi, the National Academy of Music, Dance and Drama in the meeting of its General Council held in November 2022 in New Delhi awarded the Ustad Bismillah Khan Yuva Puraskar 2021 in the field of Hindustani vocal music to _____.

- Ans
- ☐ 1. Kalamandalam Adithyan
 - ☐ 2. Rudra Shankar Mshra
 - ☒ 3. Janki Mthaiwala
 - ☐ 4. Pavitra Krishna Bhat

Q.15 Match the hills in column A with their locations/regions in column B.

| Column A (Hills) | Column B(Location/regions) |
|-------------------|----------------------------|
| 1. Shevaroy Hills | a. Eastern Ghats |
| 2. Doddabetta | b. Western Ghats |
| 3. Khasi Hills | c. Meghalaya Plateau |

- Ans
- ☐ 1. 1-b, 2-c, 3-a
 - ☒ 2. 1-a, 2-b, 3-c
 - ☐ 3. 1-b, 2-a, 3-c
 - ☐ 4. 1-a, 2-c, 3-b

Q.16 Which of the following food additives have nutritive value?

- Ans
- ☐ 1. Preservatives
 - ☒ 2. Nutritional supplements
 - ☐ 3. Food colours
 - ☐ 4. Antioxidants

Q.17 Ustad Vilayat Khan was related to the musical instrument called _____.

- Ans
- ☐ 1. sarod
 - ☐ 2. sarangi
 - ☐ 3. tabla
 - ☒ 4. sitar

Q.18 Up to which financial year has the Start-Ups Intellectual Property Protection Scheme, launched in 2016 by the Ministry of Commerce and Industry been extended?

- Ans
- ☐ 1. FY 2027
 - ☐ 2. FY 2026
 - ☐ 3. FY 2024
 - ☒ 4. FY 2023

Q.19 What are the basic components of Portland cement?

- Ans
- ☐ 1. CaOCl_3 , MgSO_4 , $\text{Al}_2(\text{SO}_4)_3$, ZnSO_4
 - ☐ 2. ZnSO_4 , CaCl_2 , $\text{Al}_2(\text{SO}_4)_3$, CuSO_4
 - ☒ 3. CaO , SiO_2 , Al_2O_3 , Fe_2O_3
 - ☐ 4. CaCl_2 , MgCl_2 , $\text{Al}_2(\text{SO}_4)_3$, ZnSO_4

Q.20 Which country is associated with the 'Navam Perahera' festival?

- Ans
- ☐ 1. Bhutan
 - ☒ 2. Sri Lanka
 - ☐ 3. Bangladesh
 - ☐ 4. Nepal

Q.21 The Poona Pact was concerned with providing representation to which of the following classes or communities?

- Ans**
- ☐ 1. Sikh
 - ☒ 2. Depressed class
 - ☐ 3. Anglo-Indian
 - ☐ 4. Muslim

Q.22 The POSHAN Abhiyaan launched in 2018 focuses on the nutritional status of adolescent girls, pregnant women, lactating mothers and children of which age group?

- Ans**
- ☒ 1. 0-6 years
 - ☐ 2. 3-6 years
 - ☐ 3. 2-5 years
 - ☐ 4. 1-3 years

Q.23 Who shall have the duty to give advice to the Government of India upon legal matters from time to time as per Article 76 of the Constitution of India?

- Ans**
- ☐ 1. Advocate General
 - ☒ 2. Attorney General
 - ☐ 3. Prime Minister
 - ☐ 4. Chief Justice of India

Q.24 Where was the 2021 Men's FIH Hockey Junior World Cup held?

- Ans**
- ☒ 1. Bhubaneswar
 - ☐ 2. Kolkata
 - ☐ 3. Indore
 - ☐ 4. Ranchi

Q.25 What is World Wide Web?

- Ans**
- ☐ 1. A web browser used for accessing online content.
 - ☐ 2. A collection of interconnected computer networks.
 - ☐ 3. A software application for browsing the internet.
 - ☒ 4. A collection of websites and web pages accessible over the internet.

Q.26 Which treaty led to the surrender of nearly half of the territory of Mysore State to the East India Company?

- Ans**
- ☐ 1. Madras
 - ☐ 2. Mangalore
 - ☒ 3. Seringapatam
 - ☐ 4. Dindigul

Q.27 Swami Vivekanand's organisation _____ stressed the ideal of salvation through social service and selfless action.

- Ans**
- ☒ 1. Ramakrishna Mission
 - ☐ 2. Bahishkrit Hitakarini Sabha
 - ☐ 3. Sadharan Brahmo Samaj
 - ☐ 4. Vedic Samaj

Q.28 Which organic compound is a toxic aromatic amine with the formula C_6H_7N that is mainly used to make a wide variety of products such as polyurethane foams, agricultural chemicals and synthetic dyes?

- Ans**
- ☐ 1. Acridine
 - ☐ 2. Quinoline
 - ☐ 3. Naphthalene
 - ☒ 4. Aniline

Q.29 Which of the following is an example of the Indo-Saracenic style of architecture built in the year 1912 for the 24th ruler of the Wodeyar dynasty?

- Ans**
- ☒ 1. Mysore Palace
 - ☐ 2. Ujjayanta Palace
 - ☐ 3. Lalgarh Palace
 - ☐ 4. Chowmahalla Palace

Q.30 The Constitution (Scheduled Tribes) Order (Third Amendment) Bill, 2022, which has been passed by the Lok Sabha seeks to amend the Constitution (Scheduled Tribes) Order, 1950, with respect to its application to which of the following states?

- Ans**
- ☐ 1. Uttar Pradesh
 - ☐ 2. Odisha
 - ☐ 3. West Bengal
 - ☒ 4. Himachal Pradesh

Q.31 During which census enumeration did the Registrar General of India provide for the first time three codes for enumeration i.e., Male-1, Female-2 and Others-3?

- Ans**
- ☐ 1. 1991
 - ☐ 2. 2001
 - ☐ 3. 1981
 - ☒ 4. 2011

Q.32 Ashtangika Marga, which guides us in eliminating human misery is concerned with which religion?

- Ans**
- ☐ 1. Saivism
 - ☐ 2. Jainism
 - ☐ 3. Vaishnavism
 - ☒ 4. Buddhism

Q.33 According to Koeppen's Scheme, which type of climate is denoted by 'BShw' in India?

- Ans**
- ☐ 1. Hot Desert
 - ☒ 2. Semi-arid steppe climate
 - ☐ 3. Monsoon with dry summer
 - ☐ 4. Polar type

Q.34 On 7th February 2023, Ministry of Social Justice & Empowerment, GOI, set up 12 Garima Greh Shelter Home for _____ on pilot basis in nine States.

- Ans**
- ☒ 1. transgender persons
 - ☐ 2. flood affected persons
 - ☐ 3. senior citizens
 - ☐ 4. homeless women

Q.35 Who among the following launched the Ombudsperson App for the Mahatma Gandhi National Rural Employment Guarantee Act in February 2022?

- Ans**
- ☐ 1. Parshottam Rupala
 - ☒ 2. Giriraj Singh
 - ☐ 3. Piyush Goyal
 - ☐ 4. Sarbananda Sonowal

Q.36 Directive Principles of State Policy is taken from which country's constitution?

- Ans**
- ☐ 1. The US
 - ☐ 2. The UK
 - ☐ 3. France
 - ☒ 4. Ireland

Q.37 The Indus system is one of the largest river basins in the world, covering a total length of how many kilometres in India?

- Ans**
- ☐ 1. 2,890 km
 - ☐ 2. 2,580 km
 - ☐ 3. 3,800 km
 - ☒ 4. 1,114 km

Q.38 Which of the following factors is responsible for moderate to heavy rain in low-lying areas and heavy snow to mountainous areas of the Indian Subcontinent during winters?

- Ans**
- ☐ 1. South east monsoon
 - ☐ 2. Conventional rain
 - ☐ 3. South west monsoon
 - ☒ 4. Western disturbances

Q.39 Match the columns.

| State | Name of primitive form of cultivation |
|-------------------|---------------------------------------|
| 1. Andhra Pradesh | a. Podu |
| 2. Jharkhand | b. Koman |
| 3. Odisha | c. Kuruwa |

- Ans
- ☐ 1. 1-b, 2-a, 3-c
 - ☐ 2. 1-c, 2-b, 3-a
 - ☒ 3. 1-a, 2-c, 3-b
 - ☐ 4. 1-a, 2-b, 3-c

Q.40 Who among the following people is exempted from the applicability of Fundamental Duties?

- Ans
- ☐ 1. Those below 21 years
 - ☐ 2. All government officials
 - ☐ 3. Armed personnel
 - ☒ 4. Foreigners who visit India

Q.41 Which of the following options represents artificial ecosystems?

- Ans
- ☐ 1. Crop ecosystem, forest and grassland ecosystem
 - ☒ 2. Fish farm, zoo, green house and hydroponics
 - ☐ 3. Fish farm, forest and ocean ecosystem
 - ☐ 4. Zoo, national park, forest and pond ecosystem

Q.42 Which of the following states did NOT experience the success of the green revolution in the first phase between years mid-60s to mid-70s?

- Ans
- ☐ 1. Tamil Nadu
 - ☐ 2. Punjab
 - ☐ 3. Andhra Pradesh
 - ☒ 4. Assam

Q.43 Before the foundation of the Vijayanagar empire, Harihar and Bukka were the nobles of which of the following dynasties?

- Ans
- ☐ 1. Hoysala of Madurai
 - ☐ 2. Chalukya of Badami
 - ☒ 3. Kakatiya of Warangal
 - ☐ 4. Chera of Kerala

Q.44 How many pairs of gill slits are present in the members of class cyclostomata of phylum vertebrata?

- Ans
- ☐ 1. 4-11
 - ☐ 2. 5-13
 - ☒ 3. 6-15
 - ☐ 4. 7-18

Q.45 Which of the following is the total value of Net National Product at the consumer point?

- Ans
- ☐ 1. Net national product at factor cost
 - ☐ 2. Gross national product at market price
 - ☒ 3. Net national product at market price
 - ☐ 4. Gross national product at factor cost

Q.46 To which of the following gharanas of music does tabla maestro Zakir Hussain belong?

- Ans
- ☐ 1. Farrukhabad
 - ☐ 2. Lucknow
 - ☐ 3. Delhi
 - ☒ 4. Punjab

Q47 In which of the following dances the basic dance formation is that of a circle that moves counter-clockwise, where dancers form concentric circles that move in opposite directions?

- Ans
- ☐ 1. Suggi
 - ☐ 2. Tamasha
 - ☒ 3. Garba
 - ☐ 4. Ras lila

Q48 In terms of trophic dynamics, wolf, Komodo dragon and crocodile are defined as:-

- Ans
- ☒ 1. apex predators
 - ☐ 2. detritivores
 - ☐ 3. decomposers
 - ☐ 4. herbivores

Q49 'Serve to Win' is the autobiography of _____.

- Ans
- ☒ 1. Novak Djokovic
 - ☐ 2. Serena Williams
 - ☐ 3. Rafael Nadal
 - ☐ 4. Pallela Gopichand

Q50 According to the Census of India 2011, which of the following states has the highest Hindu population percentage of total population?

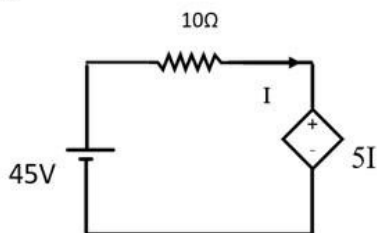
- Ans
- ☐ 1. Haryana
 - ☐ 2. Madhya Pradesh
 - ☒ 3. Himachal Pradesh
 - ☐ 4. Uttar Pradesh

Section : General Engineering Electrical

Q1 The property where magnetic field of one of the coils makes the other coil to induce an EMF in it is called _____.

- Ans
- ☐ 1. resistance
 - ☐ 2. capacitance
 - ☒ 3. mutual inductance
 - ☐ 4. self-inductance

Q2 In the circuit shown below, the power delivered by the dependent voltage source is:



- Ans
- ☐ 1. 45 W
 - ☐ 2. -15 W
 - ☐ 3. 0 W
 - ☒ 4. -45 W

Q3 In the context of electromagnetic induction, the fraction of magnetic flux produced by the current in one coil that links the other coil is called _____.

- Ans
- ☐ 1. self-induction
 - ☐ 2. mutual induction
 - ☐ 3. mutually induced EMF
 - ☒ 4. coefficient of coupling

Q.4 In a shaded-pole induction motor, in the core, when a _____ phase is applied, a/an _____ flux is generated.

- Ans
- ☐ 1. three; alternating
 - ☒ 2. single; alternating
 - ☐ 3. three; constant
 - ☐ 4. single; constant

Q.5 The cable rating suitable for connecting the load of 3 kW to a single phase supply of 230 V is _____.

- Ans
- ☒ 1. 15 A
 - ☐ 2. 5 A
 - ☐ 3. 20 A
 - ☐ 4. 10 A

Q.6 Which of the following statements is/are true in regard to auto transformers?
(i) A commonly known auto transformer, variac is used in laboratories and science labs.
(ii) An auto transformer should have small transformation when used in transmission and distribution application.
(iii) An auto transformer is used to raise the voltage in an AC feeder and is known as booster.

- Ans
- ☒ 1. (i), (ii) and (iii)
 - ☐ 2. Only (iii)
 - ☐ 3. (i) and (iii)
 - ☐ 4. Only (i)

Q.7 The instantaneous current in a circuit is given by $i = 4 \cos(\omega t + \theta)$ A. The RMS value of the current is:

- Ans
- ☐ 1. $3\sqrt{3}$ A
 - ☐ 2. zero
 - ☒ 3. $2\sqrt{2}$ A
 - ☐ 4. $4\sqrt{2}$ A

Q.8 Which of the following is a desirable characteristic of a DC servomotor?

- Ans
- ☐ 1. Big size of the machine
 - ☐ 2. Less robust
 - ☒ 3. Less inertia
 - ☐ 4. Slow response

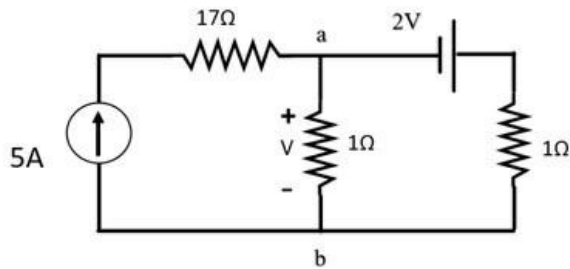
Q.9 A capacitor that stores energy of 8 J and has capacitance of 1 F has a potential difference of _____ across it.

- Ans
- ☐ 1. 1 V
 - ☒ 2. 4 V
 - ☐ 3. 12 V
 - ☐ 4. 2 V

Q.10 Which of the following is used with the pressure coil to bring the flux produced by the shunt magnet exactly in quadrature with the applied voltage?

- Ans
- ☐ 1. Copper shading bands are provided on the U limb
 - ☐ 2. Aluminium shading bands are provided on the U limb
 - ☐ 3. Aluminium shading bands are provided on the central limb
 - ☒ 4. Copper shading bands are provided on the central limb

Q11 Find the value of V in the circuit shown below.



- Ans
- ☒ 1. 3V
 - ☒ 2. 1.5V
 - ☒ 3. 0V
 - ☒ 4. -1.5V

Q12 In a transformer, the variation of which quantity leads to induce an EMF?

- Ans
- ☒ 1. Frequency
 - ☒ 2. Current
 - ☒ 3. Voltage
 - ☒ 4. Magnetic flux

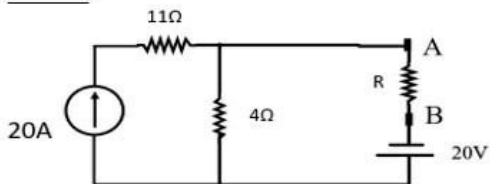
Q13 In the application of electrical and magnetic circuits, the heater element in an electric iron is manufactured by using _____.

- Ans
- ☒ 1. iron
 - ☒ 2. copper
 - ☒ 3. nichrome
 - ☒ 4. tungsten

Q14 A series RLC circuit has the following parameter values: $R = 5\ \Omega$, $L = 0.01\ \text{H}$, $C = 100\ \mu\text{F}$, Voltage source $(t) = 10 \sin 1000t$. What is the value of quality factor?

- Ans
- ☒ 1. 1.11
 - ☒ 2. 1
 - ☒ 3. 2.51
 - ☒ 4. 2

Q15 The Thevenin's equivalent voltage across terminal A-B shown in the figure is _____.



- Ans
- ☒ 1. 300 V
 - ☒ 2. 10 V
 - ☒ 3. 80 V
 - ☒ 4. 100 V

Q16 How much torque will be produced by the armature of a DC shunt machine if the machine generates 10,000 W of mechanical power in the armature and rotates at the speed of 1500 revolutions per minute?

- Ans
- ☒ 1. 0 N-m
 - ☒ 2. $\frac{200}{\pi}$ N-m
 - ☒ 3. $\frac{20}{\pi}$ N-m
 - ☒ 4. $\frac{2}{\pi}$ N-m

Q.17

Find the input capacitance for a common source(CS) MOSFET amplifier, when $C_{gs} = 5pF$, $C_{gd} = 3pF$, and $A_v = 3$.

- Ans
- ☐ 1. 10 pF
 - ☐ 2. 15 pF
 - ☒ 3. 17 pF
 - ☐ 4. 12 pF

Q.18 The current (I) flowing through the p-n junction diode is given by _____.

- Ans
- ☐ 1. $I_0 = I(e^{qV/\eta KT} - 1)$
 - ☐ 2. $I_0 = I(e^{\eta KT/qV} - 1)$
 - ☐ 3. $I = I_0(e^{\eta KT/qV} - 1)$
 - ☒ 4. $I = I_0(e^{qV/\eta KT} - 1)$

Q.19 A heater of resistance 300Ω is connected to the main supply for 10 minutes. If the heat produced in the heater during this time is 18 J, then find the current through it.

- Ans
- ☐ 1. 10A
 - ☐ 2. 0.10 A
 - ☒ 3. 0.01A
 - ☐ 4. 100 A

Q.20 In a shaded-pole induction motor, the part with copper ring is known as _____, and the copper ring is known as _____, which is usually a single-turn coil.

- Ans
- ☐ 1. shaded coil; shading pole
 - ☐ 2. shaded coil; shading coil
 - ☐ 3. shaded pole; shading pole
 - ☒ 4. shaded pole; shading coil

Q.21 The conductor of an overhead transmission line has cross-sectional area of 2 cm^2 . If the specific gravity of the conductor material is 9.9 gm/cm^3 and wind pressure is 1.5 kg/m length. The effective weight per metre of length (kg/m) of the conductor will be ____.

- Ans
- ☒ 1. 2.48 kg/m
 - ☐ 2. 3.48 kg/m
 - ☐ 3. 4.48 kg/m
 - ☐ 4. 5.48 kg/m

Q.22 In a shaded-pole induction motor, the main core flux is _____ by the flux in the ring that is developed by the _____ current.

- Ans
- ☒ 1. opposed; circulating
 - ☐ 2. supported; circulating
 - ☐ 3. opposed; constant
 - ☐ 4. supported; constant

Q.23 Consider the following statements about damper winding used to start a synchronous motor and choose the suitable combination of correct choices.

- a) When a motor is overloaded it does not stop.
- b) Synchronous motor made self-starting by providing damper winding.
- c) Damper winding consists of short-circuited copper bars embedded in the face of the field poles.
- d) Since damper winding resistance is high so it takes a small current from the supply mains.

- Ans
- ☐ 1. All a, b, c, d are true.
 - ☐ 2. Both b and c are true.
 - ☒ 3. Only a, b and c are true.
 - ☐ 4. Both b and d are true.

Q.24 In case of magnetic circuits, the ratio of the flux density developed in the magnetic material to the flux density developed in air, for the same amount of magnetising force applied to it, is called _____.

- Ans
- ☐ 1. reluctance
 - ☐ 2. EMF
 - ☒ 3. relative permeability
 - ☐ 4. absolute permeability

Q.25 Calculate the resistance per metre length of a wire of diameter 40 mm and specific resistance of $3.14 \times 10^{-4} \Omega\text{-m}$:

- Ans
- ☐ 1. 40Ω
 - ☐ 2. 400Ω
 - ☒ 3. $\frac{1}{4} \Omega$
 - ☐ 4. 4Ω

Q.26 The method of creating uniform electrostatic stress in the dielectric of underground cables is known as _____ of cables.

- Ans
- ☐ 1. laying
 - ☒ 2. grading
 - ☐ 3. armouring
 - ☐ 4. jointing

Q.27 Which of the following materials is used to construct the rotor of variable reluctance stepper motor with salient poles?

- Ans
- ☐ 1. Diamagnetic
 - ☒ 2. Ferromagnetic
 - ☐ 3. Paramagnetic
 - ☐ 4. Nonmagnetic

Q.28 Which type of generator is used in a large wind power plant?

- Ans
- ☐ 1. Slip ring motor
 - ☐ 2. Three phase alternator
 - ☒ 3. Induction generator
 - ☐ 4. DC generator

Q.29 In a series connection of inductances, L_1 and L_2 are inductances and M is the mutual inductance. Find the total inductance.

- Ans
- ☒ 1. $L_1 + L_2 + 2M$
 - ☐ 2. $L_1 + L_2 + M$
 - ☐ 3. $L_1 + L_2 - M$
 - ☐ 4. $L_1 + L_2 - 2M$

Q.30 The armature reaction effect is high in _____.

- Ans
- ☒ 1. field control method
 - ☐ 2. series parallel control method
 - ☐ 3. armature control method
 - ☐ 4. both the armature and field control methods

Q.31 Identify the FALSE statement associated with the significance of stationary armature in synchronous machine.

- Ans
- ☒ 1. In stationary armature configuration, the exciting current is relatively high; therefore, the slip rings and brush gear need to be heavy construction.
 - ☐ 2. The stationary armature is typically housed in a stationary frame, which provides a large surface area for efficient cooling. This allows the armature to operate at high temperatures without overheating, resulting in higher efficiency and longer lifespan.
 - ☐ 3. The stationary armature is responsible for producing the stator magnetic field in a synchronous machine. The magnetic field produced by the armature interacts with the magnetic field produced by the rotor to generate the torque necessary to turn the machine.
 - ☐ 4. The stationary armature is a stationary component that does not rotate, making it less prone to wear and tear. This results in a machine that is highly reliable and requires minimal maintenance.

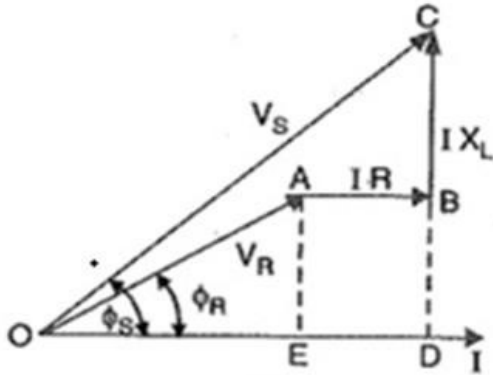
Q.32 A power system consists of a coal-fired power plant of 800 MW with the availability factor of 0.8 and a wind farm of 400 MW with the availability factor of 0.5. Find the firm power of the system.

- Ans
- ☐ 1. 1800 MW
 - ☐ 2. 1200 MW
 - ☒ 3. 840 MW
 - ☐ 4. 400 MW

Q.33 A 400 W, 100 V bulb is connected across a 50 V source. The current drawn by the bulb is

- Ans
- ☒ 1. 2 A
 - ☐ 2. 0 A
 - ☐ 3. 4 A
 - ☐ 4. 1 A

Q.34 The figure shows the lagging load phasor representation of a transmission line, where, V_S , R , X_L , V_R and I represent the sending end voltage, line resistance, line inductance, receiving end voltage and line current, respectively. Identify the transmission line which most suited for it.



- Ans
- ☐ 1. 200 kV transmission line
 - ☒ 2. 10 kV transmission line
 - ☐ 3. 400 kV transmission line
 - ☐ 4. 100 kV transmission line

Q.35 The deflection produced by a half wave rectifier type AC voltmeter is how much times the deflection produced by the DC of equal magnitude voltage?

- Ans
- ☒ 1. 0.45 times
 - ☐ 2. 0.40 times
 - ☐ 3. 0.90 times
 - ☐ 4. 0.80 times

Q.36 When one tenant re-lets space to another under the terms of their own lease, it is called

- Ans
- ☐ 1. building lease
 - ☐ 2. perpetual lease
 - ☒ 3. sublease
 - ☐ 4. occupational lease

Q.37 Select the light bulb that uses the least amount of energy while yet producing an adequate amount of light.

- Ans
- ☐ 1. Fluorescent lamp
 - ☐ 2. Incandescent lamp
 - ☒ 3. LED lamp
 - ☐ 4. Neon lamps

Q.38 Calculate the line value of induced emf of a 10-pole, 3-phase, 60 Hz star-connected alternator with 60 slots and 4 conductors per slot. The value of the pitch factor is 0.966, the distribution factor is 0.966, the flux per pole is 0.12 Wb and it is sinusoidally distributed.

- Ans
- ☐ 1. 927.36 V
 - ☐ 2. 688.92 V
 - ☐ 3. 1193.4 V
 - ☒ 4. 2066.76 V

Q.39 What is the purpose of cost estimation?

- Ans
- ☐ 1. To assess project risks
 - ☐ 2. To determine project timelines
 - ☒ 3. To predict project expenses
 - ☐ 4. To allocate human resources

Q.40 Which option is INCORRECT in relation to the applications of synchronous motors?

- Ans
- ☒ 1. They are used in factories having a large number of induction motors operated at leading power factor.
 - ☐ 2. They are used to regulate the voltage at the end of transmission line.
 - ☐ 3. They are used in large loads where constant speed is required.
 - ☐ 4. They are used in power house and substation in parallel to the bus bar to improve the power factors.

Q.41 Which of the given statements is NOT true about the double layer winding in the electrical machine?

- Ans
- ☒ 1. Leakage reactance will be more as more winding is there.
 - ☐ 2. Improved emf waveform will be there.
 - ☐ 3. Easier to manufacture and lower cost of the coils
 - ☐ 4. Fractional slot winding can be possible.

Q.42 A JFET has the following parameters: $I_{DSS} = 30 \text{ mA}$, $V_{GS}(\text{off}) = -5 \text{ V}$, $V_{GS} = -4.5 \text{ V}$. Find the value of drain current.

- Ans
- ☐ 1. 15 mA
 - ☒ 2. 0.3 mA
 - ☐ 3. 0.5 mA
 - ☐ 4. 30 mA

Q.43 Which of the following components are connected to the gearbox and generator box, respectively, in a horizontal-type wind turbine?

- Ans
- ☐ 1. Low speed shaft and accelerometer
 - ☒ 2. Low speed shaft and high speed shaft
 - ☐ 3. High speed shaft and low speed shaft
 - ☐ 4. High speed shaft and accelerometer

Q.44 If the peak value of an alternating current is 8 A, then the RMS value of the current will be _____.

- Ans
- ☒ 1. $4\sqrt{2} \text{ A}$
 - ☐ 2. $\sqrt{3} \text{ A}$
 - ☐ 3. $2\sqrt{3} \text{ A}$
 - ☐ 4. $3\sqrt{2} \text{ A}$

Q.45 The armature resistance of a 220 volt DC machine is 0.5 ohm. What is the value of the back EMF when the machine functions as a motor if the full load armature current is 25 amps?

- Ans
- ☐ 1. 209 V
 - ☒ 2. 207.5 V
 - ☐ 3. 207 V
 - ☐ 4. 210 V

Q46 Which of the following types of fields is used as a coupling medium in all electromechanical conversion devices?

- Ans
- ☐ 1. Thermal field only
 - ☐ 2. Both electric field and magnetic field
 - ☒ 3. Magnetic field only
 - ☐ 4. Electric field only

Q47 Which of the following statements regarding the spinning reserve is/are true?
A) It is the reserve capacity which is in operation, but not available for service.
B) It acts as a cushion in case of emergency requirements.
C) It is a capacity which is always connected to the bus and is used in case of need.

- Ans
- ☐ 1. A and B
 - ☐ 2. Only B
 - ☐ 3. A and C
 - ☒ 4. B and C

Q48 Which of the following constitutes a valid reason for rejecting the lowest bid?

- Ans
- ☐ 1. Unreasonable compensation is received
 - ☐ 2. Bidder has not signed
 - ☐ 3. Lack of sufficient opposition
 - ☒ 4. All of the options

Q49 The expression for the RMS value of the current of a triangular wave form is:

- Ans
- ☐ 1. $\frac{I_{\max}}{\sqrt{2}}$
 - ☐ 2. $\sqrt{3}I_{\max}$
 - ☐ 3. $\frac{I_{\max}}{2}$
 - ☒ 4. $\frac{I_{\max}}{\sqrt{3}}$

Q50 What will be the primary current of a 20 kVA, 6600/220 V, 50 Hz step-down ideal transformer?

- Ans
- ☐ 1. 1.515 A
 - ☐ 2. 0 A
 - ☐ 3. 1.3 A
 - ☒ 4. 3.03 A

Q51 Find the most economical size of a single core cable working on a 100 kV single phase system and the maximum permissible stress in the dielectric is not to exceed $50\sqrt{2}$ kV/cm.

- Ans
- ☐ 1. 0 cm
 - ☐ 2. 10 cm
 - ☒ 3. 4 cm
 - ☐ 4. 8 cm

Q52 Which of the following statements is NOT correct about generation of alternating voltage?

- Ans
- ☒ 1. A 4-pole generator completes four cycles per revolution.
 - ☐ 2. The number of times the armature rotates per second, the same number of cycles will be produced by the armature voltage.
 - ☐ 3. For the production of voltage, either the armature or the field rotates.
 - ☐ 4. An increase in the number of poles, increases the frequency.

Q.53 The no load ratio of a 50 Hz single-phase transformer is 2000/200 V. The maximum flux in the core is 0.05 Wb. What is the approximate number of primary turns?

- Ans
- ☐ 1. 145 turns
 - ☒ 2. 180 turns
 - ☐ 3. 200 turns
 - ☐ 4. 100 turns

Q.54 The bandwidth of CRO is the range of frequencies over which gain of _____.

- Ans
- ☒ 1. vertical amplifier is within 3 db of the mid-band frequency gain
 - ☐ 2. vertical amplifier is within 5 db of the mid-band frequency gain
 - ☐ 3. horizontal amplifier is within 5 db of the mid-band frequency gain
 - ☐ 4. horizontal amplifier is within 3 db of the mid-band frequency gain

Q.55 How many terminals does a servo-motor contain?

- Ans
- ☒ 1. 3
 - ☐ 2. 4
 - ☐ 3. 2
 - ☐ 4. 1

Q.56 Mechanical losses in a synchronous motor include:

- Ans
- ☐ 1. core losses in the laminations
 - ☐ 2. Joule losses in the rotor winding
 - ☒ 3. friction and windage losses
 - ☐ 4. Eddy current losses in the stator

Q.57 Select the INCORRECT statement for an overhead transmission line supported by supports at equal levels.

- Ans
- ☐ 1. Sag is directly proportional to the weight per unit length of the conductor.
 - ☐ 2. Sag is inversely proportional to the tension of the conductor.
 - ☐ 3. Sag is directly proportional to the square of the length of the conductor span.
 - ☒ 4. Sag is inversely proportional to the height of the supporting tower.

Q.58 Choose the correct alternative regarding Neon Lamps.

- Ans
- ☐ 1. If helium gas is used instead of neon, a greenish red colour is obtained.
 - ☐ 2. The neon lamp normally emits green colour.
 - ☒ 3. The neon lamp consists of neon and argon gas.
 - ☐ 4. The power factor of the neon tube is higher.

Q.59 Which of the following lamps is well suited for street lightning in terms of high luminous efficiency?

- Ans
- ☐ 1. Compact fluorescent lamp
 - ☒ 2. Sodium vapour lamp
 - ☐ 3. Fluorescent lamp
 - ☐ 4. Incandescent lamp

Q.60 Arrange the following in the increasing order of energy released during their processing as a biomass.

- A) Bagasse
B) Municipal solid waste
C) Wheat and rice straw
D) Wood pellets

- Ans
- ☐ 1. B-D-A-C
 - ☐ 2. D-B-C-A
 - ☐ 3. C-A-B-D
 - ☒ 4. A-B-C-D

Q.61 The range of a moving iron ammeter can be extended by using a _____.

- Ans
- ☐ 1. multiplier connected in series with an ammeter
 - ☐ 2. shunt connected in series with an ammeter
 - ☐ 3. multiplier connected in parallel with an ammeter
 - ☒ 4. shunt connected in parallel with an ammeter

Q.62 Self-inductance does NOT depend on which of the following parameters?

- Ans
- ☐ 1. Flux
 - ☒ 2. Length of the conductor
 - ☐ 3. Current flowing through the conductor
 - ☐ 4. Number of turns

Q.63 What will be the phase difference between the alternating current and the voltage represented by the following equation $i = I_0 \sin(\omega t)$ and $E = E_0 \cos(\omega t + \pi/3)$?

- Ans
- ☐ 1. $4\pi/3$
 - ☐ 2. $\pi/3$
 - ☐ 3. $5\pi/3$
 - ☒ 4. $5\pi/6$

Q.64 Which of the following statements is true regarding the voltage drop due to armature reaction for unity power factors in an alternator?

- Ans
- ☐ 1. The voltage drop is zero for unity power factors.
 - ☒ 2. The voltage drop is minimum for unity power factors.
 - ☐ 3. The voltage drop is maximum for unity power factors.
 - ☐ 4. The voltage drop remains constant irrespective of the power factor.

Q.65 Which of the following statements about the losses in a DC motor is INCORRECT?

- Ans
- ☐ 1. Strayload losses are produced due to the distortion of the air gap flux due to armature reaction.
 - ☐ 2. In series motors, the field ohmic loss forms a part of the armature circuit loss.
 - ☐ 3. The no load rotational loss is made up of iron loss and mechanical loss.
 - ☒ 4. Brush losses forms a part of mechanical losses.

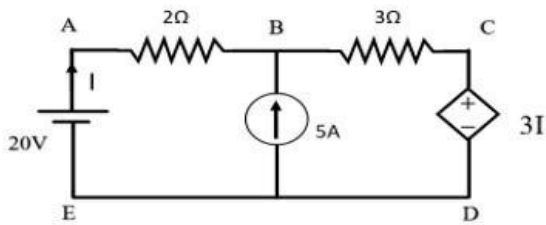
Q.66 In electromagnetic induction, Lenz's law directly follows _____.

- Ans
- ☒ 1. the law of conservation of energy
 - ☐ 2. Laplace's law
 - ☐ 3. Faraday's second law
 - ☐ 4. Faraday's first law

Q.67 Find the common base configuration current gain of a transistor, if the common emitter configuration current gain of the transistor is 50.

- Ans
- ☐ 1. 0.99
 - ☐ 2. 0.97
 - ☐ 3. 1
 - ☒ 4. 0.98

Q.68 In the circuit shown below, the value of the current I is:



- Ans
- ☒ 1. 1 A
 - ☒ 2. $-\frac{5}{8}$ A
 - ☒ 3. $\frac{5}{8}$ A
 - ☒ 4. 0 A

Q.69 An RLC series circuit has resonance frequency of 170 kHz and quality factor of 25. Find the bandwidth of the circuit.

- Ans
- ☒ 1. 50 Hz
 - ☒ 2. 68 kHz
 - ☒ 3. 13.6 kHz
 - ☒ 4. 6.8 kHz

Q.70 According to IS (Indian Standard) specification 1180-1964 for outdoor type distribution transformer, the tapings shall be provided on hv side in _____.

- Ans
- ☒ 1. 6 steps
 - ☒ 2. 3 steps
 - ☒ 3. 2 steps
 - ☒ 4. 5 steps

Q.71 The Ohmic loss during the open-circuit test is considered negligible because:

- Ans
- ☒ 1. the Ohmic loss is proportional to the square of the applied voltage, which is high in the open-circuit test
 - ☒ 2. the Ohmic loss is proportional to the square of the applied current, which is high in the open-circuit test
 - ☒ 3. the Ohmic loss is proportional to the square of the applied current, which is low in the open-circuit test
 - ☒ 4. the Ohmic loss is proportional to the square of the applied voltage, which is low in the open-circuit test

Q.72 In commercial multimeters, to obtain the same deflection on corresponding DC and AC voltage ranges, the multiplier for AC range is to be _____.

- Ans
- ☒ 1. dependent on the duration of testing
 - ☒ 2. lowered proportionately
 - ☒ 3. kept the same
 - ☒ 4. increased proportionately

Q.73 Which of the following statements are INCORRECT about PMMC instruments?

- I. The torque-to-weight ratio is high, which gives a high accuracy.
- II. A single instrument can be used for several, different current voltage ranges by using the instrument transformer.
- III. The scale is uniformly divided.
- IV. The cost of PMMC instruments is lower than that of moving iron instruments.

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

Q.74 The voltage across the impedance 'Z' is $100\angle 15^\circ$ V and the current through 'Z' is $20\angle -45^\circ$ A. Find the reactive power (Q).

- Ans
- ☐ 1. Q = 1000 VAR
 - ☐ 2. Q = 6000 VAR
 - ☐ 3. Q = 600 VAR
 - ☒ 4. Q = 1732 VAR

Q.75 In electromagnetic induction, according to Fleming's right-hand rule, the forefinger represents _____.

- Ans
- ☒ 1. direction of the magnetic field
 - ☐ 2. direction of the induced current
 - ☐ 3. direction of the motion of the conductor
 - ☐ 4. direction of the induced EMF

Q.76 What will happen with a single-phase induction motor that has a short-circuited capacitor?

- Ans
- ☐ 1. Will run in the same direction with less speed
 - ☐ 2. Will run in the reverse direction
 - ☐ 3. Will run
 - ☒ 4. Will not run

Q.77 A moving coil instrument gives a full scale deflection of 10 mA when the potential difference across its terminals is 100 mV. Calculate the shunt resistance for full scale deflection which corresponds to 200 A?

- Ans
- ☐ 1. 50.02 m Ω
 - ☐ 2. 500.02 m Ω
 - ☒ 3. 500.02 $\mu\Omega$
 - ☐ 4. 50.02 $\mu\Omega$

Q.78 Which of the following is NOT suitable for the overhead conductor of a transmission line?

- Ans
- ☐ 1. High electrical conductivity
 - ☒ 2. High specific gravity
 - ☐ 3. Lower cost
 - ☐ 4. High tensile strength

Q.79 In Electromagnetism, the field pattern of a magnetic field inside the toroid is _____.

- Ans
- ☐ 1. hyperbolic
 - ☐ 2. parabolic
 - ☒ 3. non-uniform
 - ☐ 4. uniform

Q.80 The candle power of a lamp placed normal to a working plane is 40 candle power. Find the distance if the illumination is 10 lux?

- Ans
- ☐ 1. 3 m
 - ☐ 2. 1.414 m
 - ☒ 3. 2 m
 - ☐ 4. 2.5 m

Q.81 Which of the following defines the use of a thermostat in an electric kettle?

- Ans
- ☐ 1. It is used to compare the ambient temperature with the temperature inside the kettle.
 - ☒ 2. It is used to stop the flow of electricity through the heating element once the appropriate temperature is reached.
 - ☐ 3. It is used to maintain the temperature inside the kettle.
 - ☐ 4. It is used to reduce the temperature in case of overheating of the heating element.

Q.82 In a capacitor start induction run motor, when motor reaches to _____ of full speed, the centrifugal switch S opens and cuts out capacitor from supply.

- Ans ☒ 1. 75%
- ☐ 2. 25%
- ☐ 3. 100%
- ☐ 4. 50%

Q.83 A wire of resistance $88\ \Omega$ is stretched to twice its original length. The resistance of a stretched wire would be _____.

- Ans ☐ 1. $176\ \Omega$
- ☐ 2. $22\ \Omega$
- ☐ 3. $88\ \Omega$
- ☒ 4. $352\ \Omega$

Q.84 In the wind power plant, which of the following features differentiates the wound rotor synchronous generator from squirrel cage induction generators?

- Ans ☐ 1. The wound rotor synchronous generator includes an external mechanism to control the stator side.
- ☐ 2. A gearbox is not required in the wound rotor synchronous generator.
- ☒ 3. The wound rotor synchronous generator includes an external mechanism to control the rotor output.
- ☐ 4. A reactive power compensation unit is not needed in wound rotor synchronous generators.

Q.85 In case of magnetic circuits, the flux produced per unit area of the magnetic material, for every unit of the magnetising force applied to it, is called _____.

- Ans ☒ 1. absolute permeability
- ☐ 2. MMF
- ☐ 3. relative permeability
- ☐ 4. EMF

Q.86 In electrical applications, electric geyser coils are made up of a _____.

- Ans ☒ 1. high-resistance metal
- ☐ 2. high-inductance metal
- ☐ 3. low-inductance metal
- ☐ 4. low-resistance metal

Q.87 Three phases (R, Y and B) of a balanced AC circuit with the phase sequence RYB are connected in star. These three voltages are equal in magnitude and displaced from one another by _____ electrical angle.

- Ans ☒ 1. 120°
- ☐ 2. 360°
- ☐ 3. 240°
- ☐ 4. 90°

Q.88 The compensation for light load is done by using a metallic strip provided between the _____.

- Ans ☐ 1. disc and the pointer
- ☒ 2. central limb of shunt magnet and disc
- ☐ 3. permanent magnet and disc
- ☐ 4. central limb of series magnet and disc

Q.89 Diffusion capacitance of a p-n junction diode increases with increase in the _____ and the _____.

- Ans ☒ 1. mean lifetime of minority carriers; diode current
- ☐ 2. thermal voltage; ideality factor (η)
- ☐ 3. mean lifetime of minority carriers; thermal voltage
- ☐ 4. diode current; thermal voltage

Q90 The dual pair of the node and open circuit are _____

- Ans
- ☒ 1. mesh and short circuit
 - ☐ 2. KVL and short circuit
 - ☐ 3. mesh and KCL
 - ☐ 4. mesh and open circuit

Q91 The input signal of a common drain amplifier is applied to the Gate through the ____.

- Ans
- ☒ 1. coupling capacitor
 - ☐ 2. input inductor
 - ☐ 3. variable resistor
 - ☐ 4. input resistor

Q92 How many windings are present in auto transformers?

- Ans
- ☐ 1. 2
 - ☐ 2. 4
 - ☒ 3. 1
 - ☐ 4. 3

Q93 Which of the following quantities can be changed to control the speed of the brushless DC motor?

- Ans
- ☐ 1. Wind pressure
 - ☒ 2. Applied DC source voltage
 - ☐ 3. Wind direction
 - ☐ 4. Temperature

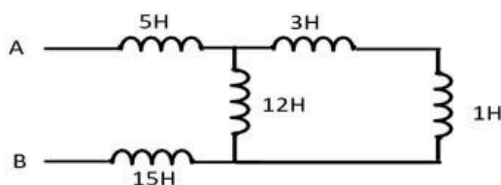
Q94 In a single value capacitor run motor, the starting torque is about _____ of rated torque.

- Ans
- ☐ 1. 20 to 30%
 - ☐ 2. 10 to 20%
 - ☒ 3. 50 to 100%
 - ☐ 4. 10 to 30%

Q95 In case of heating effect, if 1 calorie of heat energy is converted into joules, then its value will be _____.

- Ans
- ☒ 1. 4.186 joules
 - ☐ 2. 3.743 joules
 - ☐ 3. 2.563 joules
 - ☐ 4. 1.853 joules

Q96 Find the value of equivalent inductance across terminal AB in the following circuit.



- Ans
- ☐ 1. 26H
 - ☒ 2. 23H
 - ☐ 3. 36H
 - ☐ 4. 50H

Q97 If the energy stored in a 5H inductor is 160 joules, then calculate the current passing through it.

- Ans
- ☐ 1. 64 A
 - ☒ 2. 8 A
 - ☐ 3. 10 A
 - ☐ 4. 18 A

Q.98 If supports are at equal levels and tension in an overhead line is increased to two times, then _____.

- Ans
- ☐ 1. sag becomes zero
 - ☐ 2. sag also increases to four times
 - ☐ 3. sag also increases to two times
 - ☒ 4. sag decreases to half of the previous value

Q.99 The bundled conductors can be formed from two or more stranded conductors, bundled together to increase the _____.

- Ans
- ☐ 1. copper losses
 - ☐ 2. communication line interference
 - ☐ 3. line inductance
 - ☒ 4. current carrying capacity

Q.100 In a three-phase balanced star connected system, which of the following will hold true? [ϕ is the angle between phase voltage and phase current.]

- Ans
- ☒ 1. The angle between line currents and the corresponding line voltages is $30^\circ + \phi$ for lagging.
 - ☐ 2. The angle between line currents and the corresponding line voltages is $30^\circ + \phi$ for leading.
 - ☐ 3. The angle between line currents and the corresponding line voltages are in phase.
 - ☐ 4. The angle between line currents and the corresponding line voltages is $30^\circ - \phi$ for lagging.