



रेल भर्ती बोर्ड / RAILWAY RECRUITMENT BOARDS
सी ई एन - ०१/२०२५ - CEN - 01/2025
सहायक लोको पायलट की भर्ती/ Recruitment of Assistant Loco Pilot



RRB ALP 2025 CBT 2

Assistant Loco Pilot | CEN 01/2025 | CBT 2 | Armature & Coil Winder

ENGLISH ANSWER KEY

Official Answer Key

All 2 Shifts · 28-07-2026 to 28-07-2026

Questions	175 (Part A 100 + Part B 75)
Marking	+1 correct / -1/3 wrong
Duration	2 hours 30 minutes (Part A 90 min + Part B 60 min)
Sections	Part A 100 (Maths, Reasoning, Basic Sci & Engg) · Part B 75 (trade)

Every paper is set from the saved RRB question paper, with the official correct answer marked.

HOW TO USE THIS BOOK

- 1 Open the INDEX on the next page.
- 2 Click any row to jump straight to that date and shift.
- 3 Correct options are ticked in green, wrong ones crossed in red.

Check your marks, normalized score and zone-wise rank free at
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Blackbook

Score & Rank Calculator · rank.qmaths.in

Compiled 28 October 2026

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RRB ALP 2025 CBT 2 (Armature & Coil Winder) (English) · 2 shifts

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Day 1	28-07-2026	Shift 2	14:30 - 17:00	24



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Exam	RRB ALP 2025 CBT 2 (CEN 01/2025)
Paper	Armature & Coil Winder
Test Date	28 Jul 2026
Test Time	9:30 AM - 12:00 PM
Language	English

*** Note**

Correct answer carries 1 mark; each incorrect answer carries a negative mark of 1/3.

1. The option shown in green with a tick is the correct answer as per the official answer key.

2. RRB shuffles question order for every candidate inside each Part; this paper follows the order of one real response sheet.

Section : Part A

Q.1 If Rohan's income increases by 20% and his expenditure increases by 10%, then his savings increase by ₹1,200. If his original income was ₹12,000, what was his original expenditure? (Assume that savings = income – expenditure.)

- Ans
- ☒ 1. ₹10,000
 - ☒ 2. ₹11,000
 - ☒ 3. ₹12,000
 - ☒ 4. ₹9,000

Q.2 Which feature is a requirement of the BIS drawing standard in engineering drawings?

- Ans
- ☒ 1. Freehand sketches without scale
 - ☒ 2. Margin lines of random width
 - ☒ 3. Title block with specific information
 - ☒ 4. Use of colored pencils for clarity

Q.3 What should come in place of the question mark (?) in the given series?

98, 104, 116, 134, 158, ?

- Ans
- ☒ 1. 184
 - ☒ 2. 186
 - ☒ 3. 188
 - ☒ 4. 190

Q.4 If the mean of the following data is 40, then what is the value of x?

Class	10-20	20-30	30-40	40-50	50-60
Frequency	30	27	44	29	X

- Ans
- ☒ 1. 82
 - ☒ 2. 98
 - ☒ 3. 99
 - ☒ 4. 93

Q.5 Which property of a fuse wire ensures it melts quickly when excess current flows?

- Ans
- ☒ 1. High electrical resistance
 - ☒ 2. High melting point
 - ☒ 3. Thick wire
 - ☒ 4. Low melting point

- Q.6 There are two types of silver–copper alloys. The first alloy contains $93\frac{1}{3}\%$ silver, while the second alloy contains $86\frac{2}{3}\%$ silver. Find the amount of the first alloy that should be mixed with some quantity of the second alloy to obtain a 100 kg mixture containing 90% silver.
- Ans ☒ 1. 48 kg
☒ 2. 52 kg
☒ 3. 50 kg
☒ 4. 45 kg
-
- Q.7 A trader buys 187 pens at ₹23 each. During transportation, 7 pens get damaged and cannot be sold. He sells the remaining pens at ₹27 each. Find his profit percentage. (rounded off to one decimal place)
- Ans ☒ 1. 13.7%
☒ 2. 14.1%
☒ 3. 13.0%
☒ 4. 12.6%
-
- Q.8 A car travels on a highway, and its odometer records a reading of 180 km at 8:00 am and 240 km at 9:30 am. Based on this information, which statement best describes the car's average speed during this interval?
- Ans ☒ 1. The car's average speed is 240 km per hour since that was the odometer reading at 9:30 am.
☒ 2. The car's average speed is 60 km per hour based only on the change in odometer readings.
☒ 3. The car's average speed is 40 km per hour as calculated from the odometer readings and time interval.
☒ 4. The car's average speed is 180 km per hour since that was the odometer reading at 8:00 am.
-
- Q.9 A cyclist covers 120 meters in 16 seconds on a straight road, then immediately covers 180 meters in 24 seconds on a similar road segment. What is the average speed of the cyclist during the entire journey?
- Ans ☒ 1. 7.5 meters per second
☒ 2. 7.0 meters per second
☒ 3. 6.5 meters per second
☒ 4. 8.0 meters per second
-
- Q.10 What do touch gestures in Microsoft Windows allow users to do?
- Ans ☒ 1. Type faster on the keyboard
☒ 2. Connect external devices
☒ 3. Perform actions using finger movements
☒ 4. Increase screen brightness
-
- Q.11 Which of the following is both, an input and output device?
- Ans ☒ 1. Keyboard
☒ 2. Touchscreen monitor
☒ 3. Projector
☒ 4. Printer
-
- Q.12 In third angle projection, where is the object placed relative to the plane of projection?
- Ans ☒ 1. The object is placed in the third quadrant
☒ 2. The object is placed in the second quadrant
☒ 3. The object is placed in the first quadrant
☒ 4. The object is placed in the fourth quadrant
-
- Q.13 An engineer uses fault tree analysis to assess a machine-related injury in a factory. Which step should be taken first according to standard procedure?
- Ans ☒ 1. Establish preventive measures to control risks
☒ 2. List all possible causes of failures
☒ 3. Validate the analysis using workplace data
☒ 4. Define the top event representing the injury
-

Q.14 In a certain code language,
A + B means 'A is the mother of B',
A – B means 'A is the brother of B',
A × B means 'A is the wife of B' and
A % B means 'A is the father of B'.

How is Shreya related to Mahak if 'Shreya + Dev – Taran × Harshit % Mahak'?

- Ans
- ☐ 1. Father's sister
 - ☐ 2. Mother's sister
 - ☐ 3. Father's mother
 - ☒ 4. Mother's mother

Q.15 Which of the following scenarios best demonstrates the conversion of chemical energy to mechanical energy?

- Ans
- ☐ 1. A flashlight turns on after inserting new batteries
 - ☐ 2. A stone falls off a table to the ground
 - ☐ 3. A stretched rubber band snaps back to its original shape
 - ☒ 4. A runner uses stored energy from food to sprint forward

Q.16 A shopkeeper marks a product 75% above cost price and offers two successive discounts of 30% and 40%. What is the profit or loss percentage?

- Ans
- ☐ 1. 15.7% profit
 - ☐ 2. 20.9% profit
 - ☒ 3. 26.5% loss
 - ☐ 4. 22.6% profit

Q.17 Refer to the following letter series and answer the question that follows. Counting to be done from left to right only.

(Left) A T D E B R C L M Q O N P J M Q E A O Z W F U K S L (Right)

How many such vowels are there, each of which is immediately preceded by a consonant and also immediately followed by a consonant?

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

Q.18 Based on the English alphabetical order, three of the following four letter-cluster pairs are alike in a certain way and thus form a group. Which letter-cluster pair DOES NOT belong to that group?
(Note: The odd one out is not based on the number of consonants/vowels or their position in the letter-cluster.)

- Ans
- ☐ 1. DJ – GM
 - ☐ 2. AF – DI
 - ☒ 3. CH – EK
 - ☐ 4. BG – EJ

Q.19 Refer to the given letter series and answer the question that follows. Counting to be done from left to right.

(Left) B F O P P S Q A L M K A W X S N U Q J O M Y (Right)

How many such vowels are there, each of which is immediately preceded by a consonant and also immediately followed by a consonant?

- Ans
- ☐ 1. 6
 - ☐ 2. 4
 - ☐ 3. 7
 - ☒ 4. 5

Q.20 What is the primary function of a fire hydrant in a workplace safety system?

- Ans
- ☐ 1. Removing hazardous fumes from the area
 - ☐ 2. Detecting smoke and warning employees
 - ☒ 3. Supplying large quantities of water to fight fires
 - ☐ 4. Activating fire alarms automatically in emergencies

Q.21 Which approach most effectively reduces both nitrogen and phosphorus concentrations during wastewater treatment?

- Ans
- ☒ 1. Biological and chemical nutrient removal
 - ☐ 2. Primary sedimentation with extended aeration
 - ☐ 3. UV disinfection following secondary treatment
 - ☐ 4. Surface-flow constructed wetlands

Q.22 Which of the following letter-number clusters will replace the question mark (?) in the given series to make it logically complete?

QOI 5, OMG 10, MKE 15, KIC 20, ?

- Ans ☒ 1. IGA 25
☐ 2. IHS 23
☐ 3. HIZ 30
☐ 4. JHZ 24

Q.23 Refer to the following letter and symbol series and answer the question that follows. Counting to be done from left to right.

(Left) Z @ B R J # D * Q A M S % P L V O U S N T W Z (Right)

How many such symbols are there, each of which is immediately preceded by a letter and also immediately followed by a letter?

- Ans ☐ 1. None
☒ 2. Four
☐ 3. Three
☐ 4. Two

Q.24 A sum of ₹420 is divided among A, B, C, and D such that: A : B = 4 : x, B : C = x : 7, C : D = 6 : (x - 3). If B and C together get ₹210, find the value of x.

- Ans ☐ 1. 42
☐ 2. 27
☒ 3. 39
☐ 4. 53

Q.25 Three pipes A, B and C can fill a tank in 12 hours, 18 hours and 24 hours, respectively. A leak at the bottom can empty the full tank in 36 hours. If all the pipes are opened together, in how many hours will the tank be filled? (Round off your answer to two decimal places.)

- Ans ☐ 1. 3.33 hours
☐ 2. 5.56 hours
☒ 3. 6.55 hours
☐ 4. 9.45 hours

Q.26 A pendulum takes 60 seconds to complete 24 oscillations. If its length is increased and it now takes 72 seconds for the same number of oscillations, what has happened to its time period?

- Ans ☒ 1. It has increased to 3.0 seconds
☐ 2. It has decreased to 1.5 seconds
☐ 3. It remains at 2.5 seconds
☐ 4. It has decreased to 2.0 seconds

Q.27 An engineer is tasked with creating the front view of a mechanical part. The part has a rectangular base with a vertical circular hole passing through it and a triangular prism attached on top. Which of the following best describes what will be visible in the front view?

- Ans ☐ 1. Only the rectangular base outline will be visible in the front view drawing
☒ 2. The outline of rectangular base and triangular prism will be visible but hole is not shown
☐ 3. The outline of triangular prism and circular hole will be visible in front view only
☐ 4. Only the triangular prism will be clearly visible in the front view drawing

Q.28 An engineering student is tasked with creating a detailed side view of a complex machine part for an assembly drawing. Which approach will most accurately represent all features visible from the side while avoiding hidden overlaps or misinterpretations?

- Ans ☒ 1. Project all visible elements from the side and omit hidden features unless needed
☐ 2. Use only hidden lines for representing features on the far side in the view
☐ 3. Sketch the side view freely without using projections from the main view
☐ 4. Include all features even those not visible from the selected side view

Q.29 If $\left(x + \frac{1}{x}\right) = 3$, find the value of $\left(x^3 + \frac{1}{x^3}\right)$.

- Ans ☐ 1. 20
☐ 2. 16
☒ 3. 18
☐ 4. 15

Q.30 A sample of water is heated from 15 degrees Celsius to 35 degrees Celsius. What is the temperature change in Kelvin?

- Ans ☒ 1. The temperature change is 20 K.
☐ 2. The temperature change is 30 K.
☐ 3. The temperature change is 50 K.
☐ 4. The temperature change is 15 K.

Q.31 In a certain code language, 'KING' is coded as '9713' and 'ITCH' is coded as '2945'. What is the code for 'I' in the given code language?

- Ans ☐ 1. 2
☒ 2. 9
☐ 3. 7
☐ 4. 4

Q.32 Simplify: $60 - \{(-8) \times (-16 - 19 - 2)\} \div [5 \times \{2 + (-1) \times (-1)\}]$

- Ans ☐ 1. $\frac{594}{15}$
☐ 2. $\frac{614}{15}$
☐ 3. $\frac{608}{15}$
☒ 4. $\frac{604}{15}$

Q.33 A worker's hand is at risk of injury from a mechanical shearing action. Which situation best describes a shearing hazard?

- Ans ☐ 1. A hand touching a hot metallic machine surface during maintenance activity
☒ 2. A hand caught between a moving blade and a fixed machine surface during operation
☐ 3. A hand sliding repeatedly across a rough abrasive machine surface during work
☐ 4. A hand becoming entangled in a rotating machine shaft during operation

Q.34 What should come in place of the question mark (?) in the given series based on the English alphabetical order?

UMD ZQG EUJ JYM ?

- Ans ☐ 1. PDP
☐ 2. NBQ
☐ 3. NDO
☒ 4. OCP

Q.35 If a scooter travels at a constant speed of 25 km per hour, how far will it travel in 4 hours?

- Ans ☐ 1. 120 km
☒ 2. 100 km
☐ 3. 75 km
☐ 4. 80 km

Q.36 Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statements.

Statements: All girls are hens. No hen is a cat.

Conclusion (I): No girl is a cat.

Conclusion (II): Some cats are hens.

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

Q.37 What is the simplified value of the expression $\left[\frac{\cos A}{(1 - \tan A)} \right] + \left[\frac{\sin A}{(1 - \cot A)} \right]$?

- Ans ☒ 1. $\cos A + \sin A$
☐ 2. $\sin A - \cos A$
☐ 3. 1
☐ 4. 0

Q.38 Which of the following best describes a key environmental concern associated with improper disposal of e-waste?

- Ans ☒ 1. Release of toxic metals into soil and water
☐ 2. Enhanced biodegradation of plastics
☐ 3. Increased recycling rates of precious metals
☐ 4. Release of greenhouse gases from decomposition

Q.39 Solve the system of equations:

$$-3x + 2y - z = -1, 6x - 6y + 7z = -7, 3x - 4y + 4z = -6$$

- Ans ☐ 1. $x = 1, y = 2, z = 2$
☒ 2. $x = 2, y = 2, z = -1$
☐ 3. $x = 2, y = 1, z = -3$
☐ 4. $x = -2, y = 2, z = 11$

Q.40 In this question, a question is followed by two statements numbered (I) and (II). You have to decide whether the data provided in the statements are sufficient to answer the question. Read both the statements and decide the appropriate answer.

Among the five poles—I, N, C, H, and L—each having a different height, which pole is the tallest?

(I) I is shorter than N but taller than C. C is taller than only one pole.

(II) H is taller than L.

- Ans ☐ 1. Both statements I and II together (and not statement I alone or statement II alone) are sufficient to answer the question
☐ 2. Data in statement I alone is sufficient to answer the question while data in statement II is not
☒ 3. Both statements I and II together are NOT sufficient to answer the question
☐ 4. Data in statement II alone is sufficient to answer the question while data in statement I is not

Q.41 In this question, a group of numbers/symbols is coded using letter codes as per the codes given below and the conditions which follow. The correct combination of codes following the conditions is your answer. If none of the conditions follow, then the codes for the respective number/symbol are to be followed directly as given in the table.

Number/symbol	6	1	&	3	%	8	+	4	#	7	@	5	2	\$
Code	R	V	G	D	S	C	T	L	F	W	H	U	Y	N

Conditions:

- (i) If the first element is a symbol and the last element is an odd number, the codes for these two (the first and the last elements) are to be interchanged.
(ii) If the first element is an odd number and the last an even number, the first and last elements are to be coded as @.
(iii) If both the second and third elements are perfect squares, the third element is to be coded as the code for the second element.

What will be the code for the following group?

+ 6 \$ 2 7

- Ans ☐ 1. STMWV
☐ 2. WSNYT
☒ 3. WRNYT
☐ 4. TSNWW

Q.42 A boat sails 40 km downstream and then 40 km upstream in a river. The boat's speed in still water is 12 km/hr and the speed of the stream is 4 km/hr. How much time does the boat take to cover the entire distance (both upstream and downstream)?

- Ans ☐ 1. 8 hours
☒ 2. 7.5 hours
☐ 3. 10 hours
☐ 4. 6 hours

Q.43 Which of the following statements correctly reflects the characteristics of a Local Area Network (LAN) and the role of Ethernet within it?

- Ans ☐ 1. Ethernet in a LAN provides low-speed data transfer and connects users over public Internet infrastructure.
☐ 2. A LAN always requires Gigabit Ethernet to function and is insecure because it allows open access to all network devices.
☐ 3. LANs are designed for long-distance communication and use Ethernet primarily for wireless data exchange.
☒ 4. Ethernet is a standard that governs how devices in a LAN communicate via wired connections, supporting speeds from 10 Mbps to 1000 Mbps.

Q.44 Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statements.

Statements:

Some glasses are spoons.
All spoons are forks.

Conclusions:

- (I) Some glasses are forks.
(II) All forks are spoons.

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

Q.45 Seven boxes, P, Q, S, T, U, V, and W, are kept one over the other, but not necessarily in the same order. Only three boxes are kept above S. Exactly one box is kept between T and S. Exactly three boxes are kept between T and U, and U is kept somewhere above S. V is kept immediately below U. W is kept at one of the places above P. Q is not kept immediately above or below T. Based on the given information, which box is kept at the lowermost position?

Ans ☒ 1. V
☒ 2. S
☒ 3. P
☒ 4. Q

Q.46 A diamond ring costs ₹85,000. Its price is reduced first by 11% and then by 4% on the reduced price. Find the final price of the ring after both discounts.

Ans ☒ 1. ₹72,624
☒ 2. ₹74,624
☒ 3. ₹72,604
☒ 4. ₹73,624

Q.47 Which is the most important safety check before operating any machine in a workshop?

Ans ☒ 1. Ensure the machine area is properly illuminated
☒ 2. Wipe the machine with a dry cloth before use
☒ 3. Check if the machine is plugged in properly
☒ 4. Inspect the machine for loose or damaged parts

Q.48 What is the best description of the purpose of multi-view drawing in engineering drawing?

Ans ☒ 1. To show different colors of an object for better visual appearance
☒ 2. To view an object from only one direction
☒ 3. To represent different sides of an object clearly on a flat surface
☒ 4. To present the object in a single three-dimensional visual form only

Q.49 An engineer is tasked with creating a hollow cone for a machine part, where the wall thickness must be consistent and the slant height is critical for assembly. Which factor is most important to ensure the cone will fit correctly in the final design?

Ans ☒ 1. Matching only the overall height of the cone
☒ 2. Prioritizing uniform wall thickness over all other features
☒ 3. Focusing only on base diameter for precise fit
☒ 4. Ensuring the slant height matches the assembly requirement

Q.50 Which of the following statements correctly describes average velocity and its SI unit?

Ans ☒ 1. Average velocity is the total displacement divided by total time, and its unit is meter per second.
☒ 2. Average velocity is the total distance divided by total time, and its unit is meter per second.
☒ 3. Average velocity is the total distance divided by total time, and its unit is kilometer per hour.
☒ 4. Average velocity is the total displacement divided by total time, and its unit is kilometer per hour.

Q.51 Find the LCM of 72, 78, and 90.

Ans ☒ 1. 4250
☒ 2. 4680
☒ 3. 4280
☒ 4. 4120

Q.52 If 'A' stands for '+', 'B' stands for '-', 'C' stands for 'x' and 'D' stands for '÷', then what will come in place of the question mark (?) in the following equation?

28 A 16 C 3 B 12 D 4 = ?

- Ans ☐ 1. 72
☒ 2. 73
☐ 3. 70
☐ 4. 71

Q.53 A mechanical engineer must design a flange joint where two pipes are to be connected at a 45-degree angle. Which method should the engineer use to accurately represent the intersection line on a technical drawing of the two cylindrical pipes?

- Ans ☒ 1. Draw the true shape of the intersection using auxiliary projection
☐ 2. Represent the intersection as a straight line in the side view
☐ 3. Use only standard orthographic projection without auxiliary views
☐ 4. Draw a simple circle at the junction in the top view

Q.54 Which line symbol is commonly used in engineering drawings to represent a hidden edge that is not directly visible?

- Ans ☐ 1. Solid thick line
☐ 2. Chain thin line
☐ 3. Zigzag line
☒ 4. Dashed line

Q.55 A roller coaster at the top of its track has maximum potential energy. As it descends and speeds up, what principle explains why the sum of its kinetic and potential energies remains constant if we ignore friction and air resistance?

- Ans ☐ 1. Law of inertia
☐ 2. Principle of inertia
☒ 3. Law of conservation of energy
☐ 4. Principle of superposition

Q.56 A tangent PQ at a point P of a circle of radius 5 cm meets a line through the center O at a point Q such that OQ = 12 cm. What is the length of PQ?

- Ans ☐ 1. $\sqrt{117}$ cm
☒ 2. $\sqrt{119}$ cm
☐ 3. $\sqrt{97}$ cm
☐ 4. $\sqrt{107}$ cm

Q.57 G is the mother of Y. Y is the sister of V. S is the father of L. L is the husband of V. How is G related to S?

- Ans ☐ 1. Mother's mother
☐ 2. Son's wife
☐ 3. Son's wife's sister
☒ 4. Son's wife's mother

Q.58 In this question, a question is followed by two statements numbered (I) and (II). You have to decide whether the data provided in the statements are sufficient to answer the question. Read both the statements and decide the appropriate answer.

Q. Among five people – A, B, C, D, and E – who is the tallest?

(I) A is taller than B. B is taller than C.

(II) D is taller than E.

- Ans ☒ 1. Both statements I and II together are NOT sufficient to answer the question.
☐ 2. Both statements I and II together (and not statement I alone or statement II alone) are sufficient to answer the question
☐ 3. Data in statement II alone is sufficient to answer the question while data in statement I is not
☐ 4. Data in statement I alone is sufficient to answer the question while data in statement II is not

Q.59 If 'A' stands for '÷', 'B' stands for 'x', 'C' stands for '+' and 'D' stands for '-', what will come in place of the question mark '?' in the following equation?

14 A 30 B 45 C 15 D 9 = ?

- Ans ☒ 1. 27
☐ 2. 29
☐ 3. 25
☐ 4. 28

Q.60 Based on the English alphabetical order, three of the following four letter-cluster pairs are alike in a certain way and thus form a group. Which letter-cluster pair DOES NOT belong to that group?

(Note: The odd one out is not based on the number of consonants/vowels or their position in the letter-cluster.)

- Ans ☒ 1. QK-VA
☐ 2. EY-KO
☐ 3. TN-ZD
☐ 4. WQ-CG

Q.61 A conical tent has a base radius of 14 m and a height of 48 m. How many cubic meters of air can it hold? (Use $\pi = \frac{22}{7}$)

- Ans ☐ 1. 8956
☒ 2. 9856
☐ 3. 9865
☐ 4. 9568

Q.62 Namia is facing the west. She turns left and walks 15 m. She turns left and walks 25 m. She again turns left and walks 40 m. She finally turns left and walks 40 m to reach home. In which direction is her home with respect to the starting point?

- Ans ☐ 1. South-East
☐ 2. South-West
☐ 3. North-East
☒ 4. North-West

Q.63 A trader marks an article 25% above its cost price. He allows a discount of 10% on the marked price. After giving the discount, he makes a profit of ₹180 on the article. What is the cost price of the article?

- Ans ☐ 1. ₹1,260
☐ 2. ₹1,200
☐ 3. ₹1,380
☒ 4. ₹1,440

Q.64 Three workers, X, Y, and Z, can complete a certain job in 10 days, 12 days, and 15 days, respectively. Determine the number of days required for them to complete the job when they work together.

- Ans ☐ 1. 8 days
☐ 2. 6 days
☐ 3. 5 days
☒ 4. 4 days

Q.65 What is an email used for?

- Ans ☐ 1. File storage
☐ 2. Creating documents
☒ 3. Sending messages
☐ 4. Data processing

Q.66 Which integrated strategy best addresses soil pollution, falling crop yields, and low microbial activity near an industrial zone?

- Ans ☐ 1. Expand urban areas into farmland.
☒ 2. Control industrial waste for sustainability.
☐ 3. Reforestation in nearby urban centers.
☐ 4. Ban all regional chemical fertilizers.

Q.67 A train X crosses a man who is sitting in another train Y, which is moving in the opposite direction, in 8 seconds. However, when both trains are moving in the same direction, train X takes 20 seconds to pass the same man. If the length of train X is 360 meters and the length of train Y (in which the man is sitting) is 240 meters, what is the speed of train Y?

- Ans ☒ 1. 48.6 km/h
☐ 2. 46.5 km/h
☐ 3. 45.3 km/h
☐ 4. 45.8 km/h

Q.68 The circumference of the base of a solid right circular cylinder is 88 cm and its height is 150 cm. What is the volume (in cm^3) of the cylinder?

(Take $\pi = \frac{22}{7}$)

- Ans ☒ 1. 92550
☒ 2. 92500
☒ 3. 92450
☒ 4. 92400

Q.69 In how many years will a sum of ₹16,000 at 10% per annum compounded semi-annually become ₹18,522?

- Ans ☒ 1. 2.5 years
☒ 2. 2 years
☒ 3. 1 year
☒ 4. 1.5 years

Q.70 A, B, C, D, X, Y and Z are sitting around a circular table facing the centre of the table. Only two people sit between X and Z when counted from the right of X. Only two people sit between Z and D. Only three people sit between X and B. A sits to the immediate left of C. Who sits third to the left of Y?

- Ans ☒ 1. X
☒ 2. C
☒ 3. Z
☒ 4. A

Q.71 E, F, G, H, L and M live on six different floors of the same building. The lowermost floor in the building is numbered 1, the floor above it, number 2 and so on, till the topmost floor is numbered 6. Only three people live above G. Only two people live between L and E. Only two people live between M and G. E lives below G but above F. How many people live below H?

- Ans ☒ 1. One
☒ 2. Four
☒ 3. Two
☒ 4. Three

Q.72 16 is related to 260 following a certain logic. Following the same logic, 25 is related to 630. To which of the following is 9 related, following the same logic?

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

- Ans ☒ 1. 732
☒ 2. 84
☒ 3. 729
☒ 4. 78

Q.73 Which statement best describes a 'point' in engineering drawing?

- Ans ☒ 1. A point is a short line segment used to mark measurements.
☒ 2. A point is the intersection of two lines and always has measurable length.
☒ 3. A point represents a small area with both length and width.
☒ 4. A point indicates a precise location but has no size, length, or width.

Q.74 The average of 8 numbers is 45. If one number, 59, is removed, what will the new average be?

- Ans ☒ 1. 42.5
☒ 2. 42
☒ 3. 43
☒ 4. 41.5

Q.75 If 'A' stands for '+', 'B' stands for '-', 'C' stands for 'x' and 'D' stands for '÷', then what will come in place of the question mark (?) in the following equation?

31 B 35 D 7 A 9 C 2 = ?

- Ans ☒ 1. 46
☒ 2. 48
☒ 3. 44
☒ 4. 42

Q.76 An object has a mass of 10 kilograms. How does its weight on the Moon compare to its weight on Earth?

- Ans
- ☐ 1. The object weighs more on the Moon than on Earth
 - ☐ 2. The object weighs the same on both the Moon and Earth
 - ☐ 3. The object weighs zero on the Moon
 - ☒ 4. The object weighs less on the Moon than on Earth

Q.77 When using a hand file during fitting operations, which action demonstrates adherence to tool safety protocols?

- Ans
- ☐ 1. Applying excessive downward force when filing
 - ☐ 2. Filing above shoulder height for better leverage
 - ☒ 3. Fitting a proper handle securely to the tang
 - ☐ 4. Holding the file near its tang during filing work

Q.78 Below are given two sets of numbers. In each set of numbers, certain mathematical operation(s) on the first number result(s) in the second number. Similarly, certain mathematical operation(s) on the second number result(s) in the third number and so on. Which of the given options follows the same set of operations as in the given sets?

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

10 - 100 - 50 - 25; 2 - 4 - 2 - 1

- Ans
- ☐ 1. 12 - 144 - 62 - 31
 - ☒ 2. 4 - 16 - 8 - 4
 - ☐ 3. 8 - 64 - 32 - 14
 - ☐ 4. 5 - 25 - 15 - 7

Q.79 A thermometer shows a reading of 37 degrees Celsius. What is the corresponding temperature in Kelvin?

- Ans
- ☒ 1. 310 K
 - ☐ 2. 320 K
 - ☐ 3. 300 K
 - ☐ 4. 270 K

Q.80 The median of the following data is :

25, 15, 23, 25, 17, 27, 20, 18, 24, 30, 19, 28, 35, 10, 31, 40

- Ans
- ☐ 1. 20.5
 - ☒ 2. 24.5
 - ☐ 3. 25
 - ☐ 4. 23.5

Q.81 A runner completes one lap of a 200 meter circular track in 50 seconds. What is the average speed of the runner?

- Ans
- ☐ 1. 3 meter per second
 - ☒ 2. 4 meter per second
 - ☐ 3. 3.5 meter per second
 - ☐ 4. 4.5 meter per second

Q.82 P, Q, R, S and T have different ages. T is elder than only one person. S is elder than P but younger than Q. R is elder than Q. Who is the youngest?

- Ans
- ☒ 1. P
 - ☐ 2. R
 - ☐ 3. Q
 - ☐ 4. S

Q.83 Which of the following best defines 'work' in physics?

- Ans
- ☐ 1. Work is done if a force acts at any angle to the motion.
 - ☒ 2. Work is done when a force moves an object in the direction of the force.
 - ☐ 3. Work is done when energy is stored in an object.
 - ☐ 4. Work is done whenever a force is applied, regardless of movement.

Q.84 O, P, Q, U and V have different heights. Only three people have heights between V and Q. P is taller than U but shorter than O. V is taller than Q.

How many people are shorter than P?

- Ans
- ☐ 1. Four
 - ☐ 2. One
 - ☐ 3. Three
 - ☒ 4. Two

Q.85 The simple interest earned on a certain sum of money for 3 years at 15% per annum is ₹2,700. Find the sum.

- Ans ☐ 1. ₹5,000
☐ 2. ₹9,000
☒ 3. ₹6,000
☐ 4. ₹8,000

Q.86 Select the pair which follows the same pattern as that followed by the two pairs given below. Both pairs follow the same pattern.

BIP : EMU
GNU : JRZ

- Ans ☐ 1. XDE : PON
☐ 2. CGW : NHT
☒ 3. FMT : IQY
☐ 4. VCD : GRD

Q.87 Which component makes up the largest proportion of Earth's atmosphere by volume?

- Ans ☐ 1. Oxygen
☐ 2. Argon
☐ 3. Carbon dioxide
☒ 4. Nitrogen

Q.88 Which situation best describes an entanglement hazard in a mechanical workshop?

- Ans ☒ 1. Loose clothing caught in a rotating shaft
☐ 2. Gloves worn near hot surfaces
☐ 3. Hand pinched between gears
☐ 4. Finger cut by a sharp edge

Q.89 A car travels 60 km north in 2 hours, then 40 km south in the next 1 hour. What is the car's average velocity over the entire trip?

- Ans ☐ 1. 20 km/h south
☒ 2. 6.7 km/h north
☐ 3. 33.3 km/h north
☐ 4. 0 km/h

Q.90 PJAE is related to JOWH in a certain way based on the English alphabetical order. In the same way, OIVC is related to INRF. To which of the following is NEZF related to following the same logic?

- Ans ☐ 1. IKUH
☐ 2. IJVJ
☒ 3. HJVI
☐ 4. HKVJ

Q.91 What should come in place of the question mark (?) in the given series?

74, 83, 101, 128, ?, 209

- Ans ☐ 1. 176
☒ 2. 164
☐ 3. 155
☐ 4. 146

Q.92 In a spreadsheet application, a user selects a range of cells and presses Ctrl + C, followed by Ctrl + V in a different worksheet. What happens to the data?

- Ans ☐ 1. The selected cells are deleted from the original worksheet.
☐ 2. The selected cells are saved to a new file.
☒ 3. The selected cells are copied to the new worksheet.
☐ 4. The selected cells are moved to the new worksheet.

Q.93 What is the typical temperature range covered by a laboratory thermometer used in school experiments?

- Ans ☐ 1. Minus fifty to fifty degrees Celsius
☐ 2. Thirty five to forty two degrees Celsius
☒ 3. Minus ten to one hundred and ten degrees Celsius
☐ 4. Zero to two hundred degrees Celsius

Q.94 A father distributed two different amounts among his sons P, Q, R and S. First amount was distributed in the ratio 5 : 4 : 3 : 2 and the second amount was distributed in the ratio 6 : 7 : 8 : 9. If the second amount is thrice the first amount, then which son will get the maximum amount?

- Ans ☒ 1. S
☒ 2. R
☒ 3. Q
☒ 4. P

Q.95 A car travels 90 km east and then 30 km west along the same straight road. If the entire journey takes 3 hours, what is the average velocity of the car?

- Ans ☒ 1. 40 km/h east
☒ 2. 50 km/h north
☒ 3. 30 km/h east
☒ 4. 20 km/h east

Q.96 A laboratory record shows a distance of 0.004 kilometers between two points. How should this be written in SI units of length for a scientific report?

- Ans ☒ 1. 400 cm
☒ 2. 4 m
☒ 3. 4000 mm
☒ 4. 0.4 m

Q.97 When a moving car suddenly applies brakes, its kinetic energy is transformed mainly into which form of energy?

- Ans ☒ 1. Light energy
☒ 2. Sound energy
☒ 3. Potential energy
☒ 4. Heat energy

Q.98 A car of mass 1200 kg accelerates from rest to a speed of 20 m/s on a straight road. If the kinetic energy gained by the car is completely due to the work done by the engine, which of the following best represents the total kinetic energy acquired by the car at this speed?

- Ans ☒ 1. 480,000 joules
☒ 2. 12,000 joules
☒ 3. 24,000 joules
☒ 4. 240,000 joules

Q.99 What is the main purpose of ambient air quality standards?

- Ans ☒ 1. To require all industries to reduce emissions by the exact same percentage.
☒ 2. To set legally permissible limits for specific pollutants to protect public health.
☒ 3. To focus exclusively on industrial operations while ignoring other sectors.
☒ 4. To ensure air is routinely sampled to map historical pollution trends.

Q.100 Two students move identical boxes through a distance of 10 m. Student A applies a force of 50 N, while Student B applies a force of 100 N. What is the difference in the work done by the two students?

- Ans ☒ 1. 50 J
☒ 2. 1000 J
☒ 3. 500 J
☒ 4. 0 J

Section : Part B (Armature & Coil Winder)

Q.101 During nameplate installation after the Impregnation, Balancing, and Final Assembly stage of an electrical machine, which sequence follows the correct standard industrial installation procedure?

- Ans ☒ 1. Position the nameplate, secure fasteners, clean the mounting surface, mark drilling locations, and drill mounting holes
☒ 2. Drill mounting holes, mark drilling locations, clean the mounting surface, position the nameplate, and secure the nameplate using fasteners
☒ 3. Clean the mounting surface, position the nameplate, mark drilling locations, drill mounting holes, and secure the nameplate using fasteners
☒ 4. Mark drilling locations, position the nameplate, clean the mounting surface, drill mounting holes, and secure the nameplate using fasteners

Q.102 Direct material cost is ₹22,000 and direct labor cost is ₹8000. If factory overhead is charged at 25% of direct labor cost, find the factory cost.

- Ans
- ☐ 1. ₹30,000
 - ☒ 2. ₹32,000
 - ☐ 3. ₹31,000
 - ☐ 4. ₹33,000

Q.103 Which process step is performed first during the vacuum pressure impregnation process of electrical machine windings?

- Ans
- ☒ 1. Creating a vacuum inside the impregnation chamber containing the windings
 - ☐ 2. Baking the impregnated winding assembly for curing
 - ☐ 3. Filling the impregnation chamber with insulating resin
 - ☐ 4. Applying positive pressure inside the impregnation chamber

Q.104 During the winding design calculation of a 3-phase AC motor, how many stator coil groups are required for a motor having 6 poles?

- Ans
- ☒ 1. 18
 - ☐ 2. 6
 - ☐ 3. 3
 - ☐ 4. 9

Q.105 What is the mathematical term for equality between two ratios?

- Ans
- ☐ 1. Fraction
 - ☐ 2. Expression
 - ☒ 3. Proportion
 - ☐ 4. Percentage

Q.106 A DC machine has 8 poles and 128 conductors. If the winding is short-pitched by 2 conductors, what is the coil span?

- Ans
- ☒ 1. 14 Conductors
 - ☐ 2. 18 Conductors
 - ☐ 3. 20 Conductors
 - ☐ 4. 16 Conductors

Q.107 In a three-phase star (Y) connection, what is the relationship between line voltage (V_L) and phase voltage (V_{ph})?

- Ans
- ☒ 1. $V_L = \sqrt{3} V_{ph}$
 - ☐ 2. $V_L = \frac{V_{ph}}{\sqrt{3}}$
 - ☐ 3. $V_L = V_{ph}$
 - ☐ 4. $V_L = 3 V_{ph}$

Q.108 What is the primary objective of conducting an on-load operational test during the Impregnation, Balancing, and Final Assembly process of a rotating electrical machine?

- Ans
- ☐ 1. Measure insulation resistance of winding insulation before equipment energization
 - ☒ 2. Evaluate equipment performance under rated electrical and mechanical operating conditions
 - ☐ 3. Verify dimensional alignment and fastening of assembled mechanical components
 - ☐ 4. Confirm removal of surface contaminants from assembled equipment

Q.109 Why should the face of a claw hammer be kept smooth and clean?

- Ans
- ☒ 1. To prevent damage during regular use
 - ☐ 2. To reduce weight during regular use
 - ☐ 3. To secure the handle more firmly
 - ☐ 4. To improve grip during regular use

Q.110 A parallel circuit has two branches containing 10 Ω and 20 Ω resistors. If the total current supplied is 3 A, determine the current flowing through the 10 Ω resistor.

- Ans
- ☐ 1. 1.5 A
 - ☐ 2. 1 A
 - ☐ 3. 0.5 A
 - ☒ 4. 2 A

Q.111 What happens to the insulation resistance of an insulating material when the temperature increases?

- Ans
- ☐ 1. It remains constant
 - ☐ 2. It increases rapidly
 - ☒ 3. It decreases
 - ☐ 4. It becomes infinite

Q.112 In a motor sketch, what is the most effective way to represent the winding terminals?

- Ans
- ☐ 1. By sketching freehand outlines of terminals
 - ☐ 2. By omitting important terminal connection details
 - ☒ 3. By using standardized symbols and clear labels
 - ☐ 4. By assigning random letters to the terminals

Q.113 To achieve controlled step-by-step rotation in a stepper motor, which of the following input signals is applied?

- Ans
- ☐ 1. High-frequency audio signal
 - ☒ 2. Controlled digital pulse signal
 - ☐ 3. Continuous sinusoidal signal
 - ☐ 4. Random analog pulse signal

Q.114 During the post-winding polarity verification test of a rewound multi-pole single-phase fan motor, what is the most likely effect if the polarity of one or more stator coils is incorrectly reversed?

- Ans
- ☐ 1. The motor develops a uniform reverse rotating magnetic field causing normal reverse rotation
 - ☒ 2. The motor develops an unbalanced magnetic field causing reduced torque and excessive heating
 - ☐ 3. The motor produces an immediate phase-to-phase short circuit during energization
 - ☐ 4. The motor maintains normal magnetic field distribution and operates at rated performance

Q.115 The no-load voltage of an alternator is 525 V and the full-load voltage is 500 V. What is the voltage regulation?

- Ans
- ☐ 1. 3%
 - ☒ 2. 5%
 - ☐ 3. 6%
 - ☐ 4. 4%

Q.116 Why is retrogressive winding rarely used in practice in DC machines?

- Ans
- ☒ 1. It does not follow the natural direction of rotation
 - ☐ 2. It increases generated EMF
 - ☐ 3. It reduces number of conductors
 - ☐ 4. It causes mechanical imbalance

Q.117 Which of the following types of voltmeters is suitable for measuring the voltage across a component in a high resistance circuit?

- Ans
- ☐ 1. Voltmeter having low input impedance
 - ☐ 2. Voltmeter having high frequency response
 - ☐ 3. Voltmeter having high current rating
 - ☒ 4. Voltmeter having high input impedance

Q.118 Which application specifically requires a motor that must not run at no-load condition due to risk of over speeding?

- Ans
- ☐ 1. Centrifugal pump
 - ☒ 2. Electric traction
 - ☐ 3. Printing press
 - ☐ 4. Conveyor belt

Q.119 During the Impregnation, Balancing, and Final Assembly process of a three-phase star-connected induction motor, what is the most likely consequence if one phase winding is incorrectly connected to the common neutral junction?

- Ans
- ☒ 1. The motor will develop unbalanced phase currents resulting in abnormal vibration and uneven operation
 - ☐ 2. The motor will develop a direct short circuit simultaneously between all three phase windings
 - ☐ 3. The motor will experience reduced and equal phase voltage across all three stator windings
 - ☐ 4. The motor will operate at a rotational speed higher than the rated synchronous speed

Q.120 In practical transformer design, which winding type is preferred for reducing leakage reactance in power transformers?

- Ans
- ☐ 1. Spiral winding
 - ☐ 2. Lap winding
 - ☒ 3. Sandwich winding
 - ☐ 4. Concentric winding

- Q.121** During transformer oil preparation in the Impregnation, Balancing, and Final Assembly process, what corrective action is recommended if the transformer oil breakdown voltage remains below 30 KV RMS as specified in IS 335:1983 during dielectric strength testing?
- Ans ☒ 1. Increase the applied dielectric test voltage beyond the specified test limit
☒ 2. Perform transformer oil filtration to remove moisture and suspended contaminants
☒ 3. Replace the dielectric test electrodes without treating the transformer oil condition
☒ 4. Repeat the dielectric strength test without changing the transformer oil condition
-
- Q.122** If an energy meter disc rotates in the reverse direction under leading power factor loads, which corrective measure should be taken?
- Ans ☒ 1. Adjust current coil tap
☒ 2. Reverse the polarity of the pressure coil
☒ 3. Increase brake magnet strength
☒ 4. Change disc material
-
- Q.123** Which symbol usually indicates a coil in a starter circuit diagram?
- Ans ☒ 1. A triangle with a pointed shape
☒ 2. A zigzag line with angled bend
☒ 3. A rectangle with a text label
☒ 4. A circle with a center marking
-
- Q.124** When observing the chemical storage area, what is the most critical factor to check for immediate health and environmental safety?
- Ans ☒ 1. Proper segregation of incompatible chemical materials
☒ 2. Availability of protective equipment near storage area
☒ 3. Accessibility of emergency spill response equipment
☒ 4. Presence of clearly visible emergency contact signage
-
- Q.125** In a three-phase star-connected (Y-connected) system, what is the relationship between line current and phase current?
- Ans ☒ 1. Line current is double the phase current
☒ 2. Line current is half the phase current
☒ 3. Line current is zero
☒ 4. Line current equals phase current
-
- Q.126** If two AC waveforms are said to be 'in phase', what does this indicate?
- Ans ☒ 1. Their amplitudes are identical
☒ 2. Their peaks and troughs occur at the same time
☒ 3. Their directions are opposite
☒ 4. They have the same frequency but different timing
-
- Q.127** What is the reason for movement of the pointer of an analog multimeter in the opposite direction during measurement of DC voltage?
- Ans ☒ 1. Low internal battery
☒ 2. Probe polarity connection
☒ 3. Blown fuse
☒ 4. Incorrect scale selected
-
- Q.128** A shaft measurement is recorded as 24.98 mm, while the standard size is 25 mm. This indicates:
- Ans ☒ 1. severe shaft bending
☒ 2. incorrect supply voltage
☒ 3. excessive insulation failure
☒ 4. minor dimensional deviation
-
- Q.129** Why is AC electrical power commonly transmitted at very high voltage over long distances?
- Ans ☒ 1. To reduce current and minimize $I^2 R$ losses
☒ 2. To increase current and improve heating effect
☒ 3. To convert AC power into DC power
☒ 4. To avoid the use of transformers
-
- Q.130** In a DC generator, the brushes are placed along the magnetic neutral axis (MNA). What is the reason for this placement?
- Ans ☒ 1. To increase armature current
☒ 2. To increase generated EMF
☒ 3. To ensure sparkless commutation
☒ 4. To reduce brush wear

Q.131 A uniform material has mass 200 kg and volume 5 m³. Find its density.

- Ans ☐ 1. 30 kg/m³
☒ 2. 40 kg/m³
☐ 3. 20 kg/m³
☐ 4. 50 kg/m³

Q.132 An elevator driven by a DC motor fails to lift load but motor runs. What is the most probable cause?

- Ans ☐ 1. High speed
☐ 2. Open armature
☒ 3. Weak field flux
☐ 4. Low supply voltage

Q.133 What is the primary goal of the 5S methodology in industrial workplaces?

- Ans ☐ 1. To ensure compliance with industrial safety regulations only
☐ 2. To promote teamwork activities among factory workers only
☒ 3. To improve workplace organization and operational efficiency
☐ 4. To clean production equipment and machinery every day

Q.134 In a DC generator, what is the consequence if the cooling fan fails during continuous operation at rated load?

- Ans ☐ 1. Commutator voltage becomes zero
☐ 2. Generated EMF increases
☒ 3. Temperature rise leads to insulation deterioration
☐ 4. Armature resistance decreases

Q.135 A house has a total load of 2500 watts and operates at 250 volts. What is the required current rating for the main earthing conductor?

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

Q.136 In the rewinding of a three-phase squirrel-cage induction motor stator, which winding arrangement is commonly used to achieve symmetrical phase distribution and balanced rotating magnetic field production?

- Ans ☒ 1. Double-layer distributed stator winding
☐ 2. Wave winding
☐ 3. Lap winding
☐ 4. Single-phase concentrated field winding

Q.137 A DC generator is specified with 20 commutator segments and uses a simplex lap winding. How many armature coils does it have?

- Ans ☐ 1. 10
☐ 2. 15
☒ 3. 20
☐ 4. 40

Q.138 Which device is mainly used for automatically opening or closing an electrical circuit in wiring systems?

- Ans ☒ 1. Relay
☐ 2. Switch
☐ 3. Fuse
☐ 4. MCB

Q.139 Which of the following is a recommended use for Tinman's shears?

- Ans ☒ 1. Making straight sheet cuts
☐ 2. Making electrical connections
☐ 3. Producing threaded fasteners
☐ 4. Cutting small internal holes

Q.140 Which sequence correctly describes the standard procedure for dynamic balancing of a rotating electrical machine armature?

- Ans ☒ 1. Mount armature on balancing machine, rotate at specified speed, detect unbalance, apply corrective weight
☐ 2. Mount armature on balancing machine, rotate at specified speed, apply corrective weight, detect unbalance
☐ 3. Mount armature on balancing machine, apply corrective weight, detect unbalance, rotate at specified speed
☐ 4. Rotate at specified speed, mount armature on balancing machine, detect unbalance, apply corrective weight

Q.141 How is a digital multimeter connected for measuring the circuit current?

- Ans
- ☐ 1. Both series and parallel connections are correct
 - ☐ 2. Across the power supply terminals
 - ☐ 3. In parallel with the circuit
 - ☒ 4. In series with the circuit

Q.142 If the number of parallel paths in a DC machine using wave winding is doubled, what type of winding is being used?

- Ans
- ☐ 1. A lap winding is being used.
 - ☐ 2. A simplex wave winding is being used.
 - ☐ 3. A progressive winding is being used.
 - ☒ 4. A duplex wave winding is being used.

Q.143 Which parts are responsible for connecting the winding to the external circuit in conductors in case of domestic wiring?

- Ans
- ☐ 1. Bus bars
 - ☐ 2. Commutators
 - ☐ 3. Slip rings
 - ☒ 4. End connection leads

Q.144 What causes EMF generation in the armature winding of an alternator?

- Ans
- ☐ 1. Continuous heating of rotor conductors
 - ☐ 2. Chemical action inside stator insulation
 - ☒ 3. Relative motion between flux and conductors
 - ☐ 4. Friction between shaft and bearings

Q.145 Suppose a DC armature is wound with a lap winding and the number of parallel paths is increased beyond the number of poles. What operational problem is most likely to occur?

- Ans
- ☐ 1. The machine will produce more torque per path
 - ☐ 2. All armature coils will carry equal current regardless
 - ☒ 3. Current in each path will decrease, causing uneven load sharing
 - ☐ 4. Back EMF will be higher in each path, increasing speed

Q.146 What function does the traverse mechanism perform in a coil winding machine used for DC machines?

- Ans
- ☐ 1. To insulate the conductor.
 - ☒ 2. To guide the wire uniformly across the winding space.
 - ☐ 3. To supply electrical current to the winding.
 - ☐ 4. To rotate the armature core.

Q.147 Which of the following is used for supplying power at medium voltages in electrical installations?

- Ans
- ☐ 1. Flexible wire
 - ☐ 2. Twin core wire
 - ☒ 3. Armored cable
 - ☐ 4. Telephone wire

Q.148 A DC machine has 6 poles and 72 conductors. Calculate the pole pitch in terms of number of conductors.

- Ans
- ☐ 1. 60 conductors
 - ☒ 2. 12 conductors
 - ☐ 3. 72 conductors
 - ☐ 4. 18 conductors

Q.149 Which action would violate the principles of 5S?

- Ans
- ☐ 1. Cleaning workplace stations on a regular basis
 - ☒ 2. Storing excess inventory within factory walkways
 - ☐ 3. Organizing tools according to their specific function
 - ☐ 4. Labeling shelves for storage for material placement

Q.150 During transformer core assembly in the Impregnation, Balancing, and Final Assembly process, which core lamination material is used to minimize magnetizing current requirement and hysteresis power loss under alternating magnetic flux conditions?

- Ans
- ☐ 1. Aluminum
 - ☐ 2. Copper
 - ☐ 3. Ferrite
 - ☒ 4. Silicon steel

Q.151 Which of the following statements describes the materials classified under Class Y insulation in terms of their properties and limitations?

- Ans ☒ 1. They are untreated organic materials with a limiting temperature of 90°C.
☒ 2. They are synthetic materials with a limiting temperature of 130°C.
☒ 3. They are impregnated fibers with a limiting temperature of 90°C.
☒ 4. They are untreated organic materials with a limiting temperature of 180°C.

Q.152 Which statement correctly differentiates between Progressive and Retrogressive winding?

- Ans ☒ 1. Retrogressive is used only in AC machines.
☒ 2. Progressive advances, retrogressive goes backward.
☒ 3. Both have identical commutator connections.
☒ 4. Progressive has $Y_c = -1$, retrogressive has $Y_c = +1$.

Q.153 During the rewinding process of a three-phase AC induction motor, which instrument is specifically used to measure winding insulation resistance between the stator winding and motor frame?

- Ans ☒ 1. Megger
☒ 2. Wattmeter
☒ 3. Voltmeter
☒ 4. Ammeter

Q.154 During magnetic core loss testing of ferromagnetic cores used in electromechanical assemblies, which two loss components constitute the total core loss?

- Ans ☒ 1. Leakage loss and copper loss
☒ 2. Dielectric loss and leakage loss
☒ 3. Hysteresis loss and eddy current loss
☒ 4. Copper loss and dielectric loss

Q.155 A technician is tasked with installing an Earth Leakage Circuit Breaker (ELCB) in a facility where sensitive electronic equipment is used. Which installation method will ensure that the ELCB correctly detects and isolates earth faults without causing unnecessary interruptions?

- Ans ☒ 1. Connect the ELCB so that all circuit conductors, including the neutral, pass through the ELCB's sensing coil
☒ 2. Connect the ELCB only to the phase wire before the load
☒ 3. Install the ELCB on the earth wire between equipment and ground rod
☒ 4. Wire the ELCB to the load side conductors, but not the return path

Q.156 If an electrical drawing includes a symbol of two parallel lines with a gap between them, what component does this depict?

- Ans ☒ 1. Capacitor
☒ 2. Single wire
☒ 3. Battery
☒ 4. Resistor

Q.157 What distinguishes an on-load performance test from a no-load test during the Impregnation, Balancing, and Final Assembly process of an electrical machine?

- Ans ☒ 1. It verifies dimensional alignment of assembled mechanical components without energization
☒ 2. It evaluates machine performance while supplying or consuming rated output power
☒ 3. It measures winding insulation resistance using a megohmmeter under de-energized conditions
☒ 4. It evaluates machine performance with the shaft mechanically uncoupled from all loads

Q.158 A three-phase alternator gives 440 V at no load and 400 V at full load. Calculate the percentage voltage regulation.

- Ans ☒ 1. 8%
☒ 2. 10%
☒ 3. 12%
☒ 4. 15%

Q.159 Which of the following is the primary purpose of applying impregnation treatment during the rewinding process of an AC motor?

- Ans ☒ 1. To modify electromagnetic flux distribution within the rotating magnetic field system
☒ 2. To mechanically secure winding conductors and improve insulation protection against moisture and contaminants
☒ 3. To reduce magnetic hysteresis and eddy current losses within the laminated stator core
☒ 4. To increase dimensional uniformity of the air gap between the stator and rotor assemblies

Q.160 Which of the following must exist to generate EMF in a DC generator?

- Ans
- ☐ 1. Only resistance
 - ☐ 2. Only conductor
 - ☒ 3. Relative motion between conductor and magnetic field
 - ☐ 4. Only magnetic field

Q.161 During the rewinding process of a three-phase AC motor stator, which procedure must be repeatedly performed for each pole group until completion of the main winding?

- Ans
- ☐ 1. Apply insulating varnish immediately after winding each individual pole group
 - ☒ 2. Repeat coil insertion, coil placement, and temporary slot wedging operations for each pole group
 - ☐ 3. Replace the stator winding conductor with a different wire gauge for each pole group
 - ☐ 4. Perform insulation resistance measurement after winding each individual pole group

Q.162 Which of the following best explains the purpose of transformer oil filtration during the Impregnation, Balancing, and Final Assembly process?

- Ans
- ☐ 1. It applies lubricating properties to mechanical assembly contact surfaces
 - ☐ 2. It increases transformer oil temperature to reduce oil viscosity during circulation
 - ☒ 3. It removes moisture and suspended contaminants to improve dielectric insulation performance
 - ☐ 4. It modifies transformer oil chemical composition to alter dielectric characteristics

Q.163 An electrical grid in a coastal region needs to select a conductor material that balances weight, cost, and resistance to corrosion. Given these considerations, which is the suitable choice?

- Ans
- ☐ 1. Steel conductors are preferred for their mechanical durability and low cost.
 - ☒ 2. Aluminium conductors are preferred due to their light weight, lower cost, and good corrosion resistance.
 - ☐ 3. Copper conductors are preferred for their high conductivity and strength.
 - ☐ 4. Silver conductors are preferred for their excellent conductivity and reliability.

Q.164 An organization aims to improve future job planning by collecting accurate failure history data for reliability analysis. Which documentation method will best support this goal?

- Ans
- ☒ 1. Recording detailed fault reports for every equipment failure event
 - ☐ 2. Maintaining yearly breakdown summaries for workshop equipment records
 - ☐ 3. Recording preventive maintenance schedules without equipment faults
 - ☐ 4. Depending mainly on operator observations for equipment fault history

Q.165 What is the function of an autotransformer starter used with a three-phase induction motor?

- Ans
- ☐ 1. To increase the frequency of supply
 - ☐ 2. To increase the running speed of motor
 - ☐ 3. To reverse the direction of rotation
 - ☒ 4. To reduce the starting current drawn

Q.166 In a three-phase star-connected system, the phase voltage (V_{ph}) is 230 V. Determine the line voltage (V_L).

- Ans
- ☐ 1. 230 V
 - ☐ 2. 460 V
 - ☒ 3. $230\sqrt{3}$ V
 - ☐ 4. $\frac{230}{\sqrt{3}}$ V

Q.167 Which equipment is primarily used to conduct the high-speed test in the Impregnation, Balancing, Final Assembly process?

- Ans
- ☐ 1. Megger insulation tester
 - ☒ 2. Dynamic balancing machine
 - ☐ 3. Digital voltmeter
 - ☐ 4. Torque wrench

Q.168 Which combination of mechanical components is correctly associated with the assembly of a shaft coupling used to transmit rotational power between two rotating shafts?

- Ans
- ☐ 1. Fixed resistors and rolling bearings
 - ☐ 2. Washers and light-emitting diodes
 - ☐ 3. Inductors and electromagnetic relays
 - ☒ 4. Rotating shafts and mechanical couplings

Q.169 A protection engineer is designing a protection and metering scheme for a three-phase transformer using Current Transformers (CTs) and Potential Transformers (PTs). What is the purpose of the PTs in this system?

- Ans
- ☐ 1. To isolate the transformer during fault conditions automatically
 - ☐ 2. To supply excitation power to CTs
 - ☐ 3. To measure line current for overload detection
 - ☒ 4. To provide proportional voltage signals for relays and meters

Q.170 Which condition ensures that all armature conductors are included in a single closed wave winding?

- Ans
- ☐ 1. Number of commutator segments must be prime
 - ☐ 2. Number of poles must be even
 - ☐ 3. Armature resistance must be low
 - ☒ 4. Winding pitch must satisfy proper closure condition

Q.171 According to the law of conservation of energy, energy can neither be:

- Ans
- ☐ 1. Stored nor transferred
 - ☐ 2. Converted nor utilized
 - ☐ 3. Measured nor calculated
 - ☒ 4. Created nor destroyed

Q.172 What type of line is used to indicate hidden internal features in a motor sketch?

- Ans
- ☐ 1. Continuous line
 - ☐ 2. Thick line
 - ☒ 3. Dashed line
 - ☐ 4. Chain line

Q.173 In electromechanical assembly operations, which statement correctly distinguishes a jig from a fixture?

- Ans
- ☐ 1. A fixture is exclusively used for welding operations, whereas a jig is used for machining operations
 - ☐ 2. A jig only clamps the workpiece, whereas a fixture only guides the cutting tool
 - ☐ 3. A jig and a fixture perform identical functions in all manufacturing operations
 - ☒ 4. A jig accurately locates the workpiece and guides the cutting tool, whereas a fixture only locates and secures the workpiece

Q.174 Where is the Buchholz relay typically installed in an oil-immersed transformer?

- Ans
- ☐ 1. At the external cooling fins
 - ☐ 2. Inside the transformer core
 - ☐ 3. On the primary winding
 - ☒ 4. Between the main tank and conservator

Q.175 What is a critical step before storing cutting tools after use in woodworking?

- Ans
- ☒ 1. Wiping tools dry and removing debris carefully
 - ☐ 2. Leaving tools unattended on the workbench area
 - ☐ 3. Placing tools in closed boxes without cleaning
 - ☐ 4. Soaking tools in water before storage overnight



रेल भर्ती बोर्ड / RAILWAY RECRUITMENT BOARDS
सी ई एन - ०१/२०२५ - CEN - 01/2025
सहायक लोको पायलट की भर्ती/ Recruitment of Assistant Loco Pilot



Exam	RRB ALP 2025 CBT 2 (CEN 01/2025)
Paper	Armature & Coil Winder
Test Date	28 Jul 2026
Test Time	2:30 PM - 5:00 PM
Language	English

*** Note**

Correct answer carries 1 mark; each incorrect answer carries a negative mark of 1/3.

1. The option shown in green with a tick is the correct answer as per the official answer key.

2. RRB shuffles question order for every candidate inside each Part; this paper follows the order of one real response sheet.

Section : Part A

Q.1 Which of the following correctly states the full form of CD and the technology used to store data on it?

- Ans ☒ 1. Compact Disc, Optical Storage
☒ 2. Compact Drive, Optical Storage
☒ 3. Compact Disc, Magnetic Storage
☒ 4. Compact Drive, Magnetic Storage

Q.2 A ramp is used to lift a box to a platform 2 m high. To reduce the effort required, the ramp length is increased from 4 m to 8 m. Assuming negligible friction, what remains unchanged?

- Ans ☒ 1. The mechanical advantage
☒ 2. The work done in raising the box
☒ 3. The force required
☒ 4. The distance moved along the ramp

Q.3 A car travels from point A to point B in a zigzag path, covering a total distance of 200 meters. If the shortest straight-line distance between A and B is 120 meters, which statement best describes the car's distance and displacement?

- Ans ☒ 1. The distance is 120 meters; the displacement is 200 meters
☒ 2. The distance is 200 meters; the displacement is 200 meters
☒ 3. The distance is 200 meters; the displacement is 120 meters
☒ 4. The distance is 120 meters; the displacement is 120 meters

Q.4 Which statement best describes how the mass and speed of an object affect its kinetic energy?

- Ans ☒ 1. An object with less mass and lower speed will have more kinetic energy.
☒ 2. An object with greater mass and higher speed will have more kinetic energy.
☒ 3. An object with same mass but higher speed will have less kinetic energy.
☒ 4. An object with greater mass but lower speed will have more kinetic energy.

Q.5 What is a key feature of single stroke lettering in technical drawings?

- Ans ☒ 1. Each character is made with several parallel lines.
☒ 2. Each character is made with one continuous stroke.
☒ 3. Each character is outlined and then filled.
☒ 4. Each character is shaded after drawing.

Q.6 Two trains are moving in opposite directions. The first train is 120 m long and runs at 54 km/h. The second train is 180 m long and runs at 72 km/h. How much time will they take to cross each other completely? (Rounded up to two decimal places)

- Ans ☒ 1. 7.57 seconds
☒ 2. 8.43 seconds
☒ 3. 8.57 seconds
☒ 4. 9.25 seconds

Q.7 Refer to the given letter series and answer the question that follows. Counting to be done from left to right only.

(Left) H S A N D D I A D F P A J O S K I O Z O T X (Right)

How many such consonants are there, each of which is immediately preceded by a consonant and also immediately followed by a vowel?

- Ans ☒ 1. Six
☒ 2. Five
☒ 3. Three
☒ 4. Four

Q.8 What information does a kilometer stone provide to travelers on a road?

- Ans ☒ 1. Direction of travel
☒ 2. Distance from a reference point
☒ 3. Time taken to reach destination
☒ 4. Speed of the vehicle

Q.9 Which of the following is the best example of municipal solid waste?

- Ans ☒ 1. Hospital biomedical waste
☒ 2. Mining tailings
☒ 3. Industrial process waste
☒ 4. Household kitchen garbage

Q.10 Which tool safety measure best prevents injuries when cleaning a workshop lathe after use?

- Ans ☒ 1. Using a rag to remove metal dust from the lathe
☒ 2. Wiping metal chips using bare hands directly
☒ 3. Using a brush to remove metal chips from the lathe
☒ 4. Blowing chips away with compressed air around the lathe

Q.11 P, Q and R are three batsmen. The ratios of runs scored by them in a certain match were as follows:

$P : Q = 5 : 7$ and $Q : R = 2 : 3$.

If they scored a total of 765 runs, then find the number of runs scored by R.

- Ans ☒ 1. 378
☒ 2. 350
☒ 3. 357
☒ 4. 336

Q.12 A sum of money invested at simple interest amounts to ₹21,500 in 5 years and ₹26,000 in 8 years. Find the principal amount (in ₹).

- Ans ☒ 1. 7,500
☒ 2. 15,500
☒ 3. 12,000
☒ 4. 14,000

Q.13 A cyclist travels from the kilometer stone marked 52 to the stone marked 79. How far has the cyclist traveled?

- Ans ☒ 1. 27 kilometers
☒ 2. 31 kilometers
☒ 3. 52 kilometers
☒ 4. 131 kilometers

Q.14 What is the primary role of the Central Processing Unit (CPU) in a computer system?

- Ans ☒ 1. To store long-term data
☒ 2. To execute program instructions
☒ 3. To manage network connections
☒ 4. To display output on the screen

Q.15 Five students, N, O, R, S and T, have different heights. T is taller than N. R is taller than S but shorter than O. S is taller than N. More than two people are taller than T. How many people are shorter than R?

- Ans ☒ 1. Two
☒ 2. None
☒ 3. One
☒ 4. Three

Q.16 Why are electric wires in household appliances usually covered with plastic or rubber coating?

- Ans ☒ 1. To prevent electric shocks by insulation
☒ 2. To produce more heat
☒ 3. To make the wires heavier
☒ 4. To increase the flow of current

Q.17 A hiker lifts a backpack from the ground to a ledge 2 meters above the ground. Which situation would result in the greatest increase in the backpack's gravitational potential energy?

- Ans ☒ 1. Carrying the same backpack horizontally for 2 meters
☒ 2. Lifting a heavier backpack to the same 2-meter ledge
☒ 3. Lifting the same backpack to a 1-meter ledge
☒ 4. Lifting a lighter backpack to the same 2-meter ledge

Q.18 When drawing repeated 67° angles on an engineering sheet, which practice best helps minimize cumulative alignment errors?

- Ans
- ☒ 1. Drawing all angles continuously without intermediate verification
 - ☒ 2. Using the same reference line for all repeated angles
 - ☒ 3. Relying solely on the initial protractor alignment for all angles
 - ☒ 4. Marking all angles lightly with a pencil before finalizing

Q.19 Why does biomedical waste require special handling compared to general municipal waste?

- Ans
- ☒ 1. It may contain infectious agents that pose health risks.
 - ☒ 2. It is more likely to be recycled than other types of waste.
 - ☒ 3. It has higher chemical content and is always toxic.
 - ☒ 4. It is always radioactive and requires heavy shielding.

Q.20 Refer to the given letter series and answer the question that follows.

(Left) A X T N K R Q K C P S I D F J U D O R G Z M B E L (Right)

How many letters are there in the English alphabetical series between the letter that is fourth from the right end and the letter that is third from the left end of the series?

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

Q.21 If $x + \frac{1}{x} = 5$, then $\frac{x^3 - 5x^2 + 5x}{x^2 + 1}$ is equal to:

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

Q.22 The cost of a diamond varies directly with the square of its weight. A diamond broke into four pieces with weights in the ratio 2:4:1:3. If it had been broken into four equal pieces, the loss would have been ₹60,000. What was the original cost of the diamond?

- Ans
- ☒ 1. ₹80,000
 - ☒ 2. ₹78,000
 - ☒ 3. ₹75,000
 - ☒ 4. ₹82,000

Q.23 A, B, C, D and E have different heights. E is taller than C but shorter than A. Only one person is taller than A. D is shorter than C. Who amongst them is the third tallest?

- Ans
- ☒ 1. C
 - ☒ 2. A
 - ☒ 3. E
 - ☒ 4. B

Q.24 Simplify the following expression.

$$11 \text{ of } 7 + 125 \div 5 + 99 \div 11 \times 7 - 17 \text{ of } 7 + 7 \times 6 - (91 \div 7 + 7 \times 5)$$

- Ans
- ☒ 1. 48
 - ☒ 2. 36
 - ☒ 3. 40
 - ☒ 4. 44

Q.25 G is the mother of Y. Y is the sister of V. S is the father of L. L is the son of V. How is G related to L?

- Ans
- ☒ 1. Mother
 - ☒ 2. Sister
 - ☒ 3. Mother's mother
 - ☒ 4. Mother's sister

Q.26 Which symbol best represents a battery in an electric circuit diagram according to standard conventions?

- Ans
- ☒ 1. Two short lines placed together
 - ☒ 2. A single long line only
 - ☒ 3. Two circles connected in series
 - ☒ 4. A pair of long and short parallel lines placed alternately

Q.27 An astronaut weighs 600 N on Earth. During a moon mission, she performs an experiment to measure her weight on the moon. Which value is closest to her expected weight on the moon, and why?

- Ans ☒ 1. 200 N, because the Moon's gravity is about one-third of Earth's.
☒ 2. 100 N, because the Moon's gravity is about one-sixth of Earth's.
☒ 3. 600 N, because a person's weight remains unchanged on the Moon.
☒ 4. 300 N, because the Moon's gravity is about one-half of Earth's.

Q.28 If the height of an object is doubled while its mass remains constant, its gravitational potential energy will be:

- Ans ☒ 1. unchanged
☒ 2. decreased to one-fourth
☒ 3. halved
☒ 4. doubled

Q.29 A pump can fill a tank in 3 hours. Due to a leak in the tank, it takes 4.5 hours to fill the tank. In how much time can the leak empty the full tank if no other entry or exit routes are open?

- Ans ☒ 1. 7 hours
☒ 2. 9 hours
☒ 3. 8 hours
☒ 4. 6 hours

Q.30 SANZ is related to YUTT in a certain way based on the English alphabetical order. In the same way, MTHM is related to SNNG. To which of the following is LJRE related to following the same logic?

- Ans ☒ 1. QEYZ
☒ 2. REXZ
☒ 3. QDYY
☒ 4. RDXY

Q.31 If 2 is subtracted from each odd digit and 2 is added to each even digit in the number 235234796423, what will be the sum of the digits that are third from the left and third from the right?

- Ans ☒ 1. 9
☒ 2. 6
☒ 3. 8
☒ 4. 7

Q.32 Pipes A and B can fill an entire tank in 8 hours and 12 hours, respectively. The water tank is one-fourth full. If both the pipes are opened together, then how long will it take to fill the remaining part of the tank?

- Ans ☒ 1. 3 hours 26 minutes
☒ 2. 3 hours 6 minutes
☒ 3. 3 hours 16 minutes
☒ 4. 3 hours 36 minutes

Q.33 If a rectangular field is measured to be 120 meters long and 75 meters wide, what is its area in SI units?

- Ans ☒ 1. 19500 square meters
☒ 2. 15000 square meters
☒ 3. 1800 square meters
☒ 4. 9000 square meters

Q.34 Refer to the following letter series and answer the question that follows. (Counting to be done from left to right only.)

(Left) Q K Q N X K G G V M L A W T W K N G V (Right)

How many such consonants are there each of which is immediately preceded by a vowel and also immediately followed by a consonant?

- Ans ☒ 1. None
☒ 2. Two
☒ 3. Three
☒ 4. One

Q.35 What should come in place of the question mark (?) in the given series based on the English alphabetical order?

MDB PHE SLH VPK ?

- Ans ☒ 1. YTN
☒ 2. ZTM
☒ 3. XSM
☒ 4. ZUO

Q.36 The average of five numbers is 30. If four of the numbers are 25, 35, 28 and 32, then what is the fifth number?

- Ans ☒ 1. 35
☒ 2. 28
☒ 3. 30
☒ 4. 32

Q.37 An engineering firm is tasked with creating a set of technical drawings for a large-scale project. The client specifies that all components must fit on a single sheet without reducing the drawing scale, and the total drawing area required is approximately 1 square meter. Based on standard drawing sheet sizes, which sheet should the firm select to best meet these requirements?

- Ans ☒ 1. A0 size sheet
☒ 2. A2 size sheet
☒ 3. A3 size sheet
☒ 4. A1 size sheet

Q.38 A question is followed by two statements numbered (I) and (II). You have to decide whether the data provided in the statements are sufficient to answer the question. Read both the statements and select the most appropriate answer.

Question:

Among five trees N, O, R, S, and T, each having a different height, which tree is the tallest?

Statements:

- (I) T is taller than R. N is taller than T.
(II) R is shorter than O but taller than S.

- Ans ☒ 1. Both statements I and II together are NOT sufficient to answer the question
☒ 2. Data in Statement I alone is sufficient to answer the question while data in statement II is not
☒ 3. Both statements I and II together (and not statement I alone or statement II alone) are sufficient to answer the question
☒ 4. Data in Statement II alone is sufficient to answer the question while data in statement I is not

Q.39 A laboratory thermometer has a range from -10 degrees Celsius to 110 degrees Celsius and 120 equal divisions. What is the smallest value that this thermometer can read?

- Ans ☒ 1. 10 degrees Celsius
☒ 2. 1 degree Celsius
☒ 3. 0.5 degrees Celsius
☒ 4. 2 degrees Celsius

Q.40 A, B, C, D, X, Y and Z are sitting around a circular table facing the centre of the table. Only two people sit between Y and C when counted from the left of C. D sits third to the left of B. A sits to the immediate right of B. A sits second to the left of Y. Z is not an immediate neighbor of D. Who sits third to the right of X?

- Ans ☒ 1. A
☒ 2. C
☒ 3. Y
☒ 4. D

Q.41 Which intervention most effectively reduces ground-level pollutant concentrations during a winter temperature inversion?

- Ans ☒ 1. Reducing local wind speed to minimize horizontal dispersion
☒ 2. Increasing surface temperatures near emission sources
☒ 3. Elevating emission sources above inversion layers
☒ 4. Enhancing vertical air mixing through artificial turbulence

Q.42 Which of the following letter-number clusters will replace the question mark (?) in the given series to make it logically complete?

GXM 5, JVN 11, MTO 24, PRP 51, ?

- Ans ☒ 1. SPQ 107
☒ 2. SPQ 106
☒ 3. TPQ 106
☒ 4. TPQ 107

Q.43 If the mean of the following data is 45, then what is the value of x?

Class	10-20	20-30	30-40	40-50	50-60
Frequency	23	30	31	45	X

- Ans ☒ 1. 160
☒ 2. 188
☒ 3. 180
☒ 4. 162

Q.44 Based on the English alphabetical order, three of the following four letter-cluster pairs are alike in a certain way and thus form a group. Which letter-cluster pair DOES NOT belong to that group?

(Note: The odd one out is not based on the number of consonants/vowels or their position in the letter-cluster.)

- Ans ☒ 1. PJ-QK
☒ 2. HB-IC
☒ 3. FZ-GA
☒ 4. RL-SN

Q.45 Read the given statement(s) and conclusions carefully. Assuming that the information given in the statement(s) is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statement(s).

Statements:

All chocolates are paneers.
No paneer is a milk.

Conclusions:

- (I) No chocolate is a milk.
(II) Some milks are paneers.

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

Q.46 Sohan covers a total distance of 760 km to reach his home, traveling partly by train and partly by car. He takes 8 hours when he travels 160 km by train and the rest by car. If he travels 240 km by train and the remaining distance by car, his journey takes 12 minutes longer. Find the difference between the speeds of the train and the car.

- Ans ☒ 1. 23 km/h
☒ 2. 21 km/h
☒ 3. 20 km/h
☒ 4. 27 km/h

Q.47 Which scenario best demonstrates proactive workplace safety behavior?

- Ans ☒ 1. Identifying and correcting hazards before accidents occur
☒ 2. Discussing only past safety problems in meetings
☒ 3. Reporting hazards after incidents happen
☒ 4. Waiting for a supervisor to notice hazards

Q.48 Which combination best describes the main environmental challenges associated with plastic waste management?

- Ans ☒ 1. Persistence in the environment and microplastic formation
☒ 2. Thermal pollution and effective composting
☒ 3. Neutralization and easy recycling
☒ 4. Rapid biodegradation and chemical leaching

Q.49 A boy uses a wheelbarrow to carry sand. The wheel acts as the pivot, the sand is placed in the tray, and the boy lifts the handles. In this arrangement, the sand represents _____.

- Ans ☒ 1. Effort
☒ 2. Fulcrum
☒ 3. Load
☒ 4. Arm

Q.50 The mean of 11 numbers is 10.9. If the mean of the first 6 numbers is 10.5 and the mean of the last 6 numbers is 11.4, then find the 6th number.

- Ans ☒ 1. 10
☒ 2. 10.5
☒ 3. 11.5
☒ 4. 11

Q.51 Srinu starts from his home and drives 2 km towards the south, then takes a right turn and drives 5 km. He then takes a right turn and drives 6 km before taking a right turn again and driving 4 km further. Srinu finally takes a right turn and drives 4 km before stopping at his office. In which direction should Srinu drive to reach his home again? (All turns are 90-degree turns only unless specified.)

- Ans ☒ 1. East
☒ 2. West
☒ 3. North
☒ 4. South

Q.52 When a cutting plane line passes through a hole and a rib, which feature should be sectioned in the resulting view according to standard conventions?

- Ans ☒ 1. The hole is sectioned but the rib is shown unsectioned
☐ 2. Both the hole and the rib are shown unsectioned
☐ 3. Both the hole and the rib are shown sectioned
☐ 4. The rib is sectioned but the hole is left unsectioned

Q.53 If $3x - 2y + 3z = 8$, $4x - 3y + 2z = 4$ and $2x + y - z = 1$, then find x, y and z, respectively.

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

Q.54 Which statement best describes the side view in engineering drawing?

- Ans ☐ 1. It shows the object as seen clearly from the front
☒ 2. It shows the object as seen from left or right side
☐ 3. It shows a combination of all views of the object
☐ 4. It shows the object as seen from above or below

Q.55 Which of the following statements best describes a cuboid as used in engineering drawing?

- Ans ☐ 1. A cuboid has all sides and angles equal, making it similar to a cube.
☐ 2. A cuboid is a solid where all faces are parallelograms but not necessarily rectangles.
☒ 3. A cuboid is a solid with six rectangular faces, and opposite faces are equal.
☐ 4. A cuboid has all faces as squares of equal size.

Q.56 What is the primary purpose of a Local Area Network (LAN)?

- Ans ☒ 1. To connect computers within a small geographical area
☐ 2. To connect global networks
☐ 3. To connect social media accounts
☐ 4. To link wireless devices only

Q.57 A group of numbers/symbols is coded using letter codes as per the codes given below and the conditions that follow. The correct combination of codes following the conditions is your answer.

Note: If none of the conditions follow, then the codes for the respective number/symbol are to be followed directly as given in the table.

Number/symbol	3	@	8	4	\$	&	2	%	#	1	+	9	7	5
Code	U	G	B	K	M	F	X	R	E	Q	S	C	V	T

Conditions –

- (i) If the first element is a symbol and the last element an odd number, the codes for these two (the first and the last elements) are to be interchanged.
(ii) If the first element is an odd number and the last an even number, the first and the last elements are to be coded as ©
(iii) If both second and third elements are perfect squares, the third element is to be coded as the code for the second element.

What will be the code for the following group?

& 8 \$ 9 5

- Ans ☐ 1. FCBMT
☐ 2. FBMCT
☒ 3. TBMCF
☐ 4. TCMBF

Q.58 What will come in the place of '?' in the following equation, if '+' and '-' are interchanged and 'x' and '÷' are interchanged?
 $5 \div 3 + 15 \times 5 - 3 = ?$

- Ans ☒ 1. 15
☐ 2. 9
☐ 3. 18
☐ 4. 12

Q.59 Why is a room thermometer generally mounted vertically on a wall?

- Ans ☐ 1. It prevents the liquid from freezing inside the thermometer.
☐ 2. It helps the thermometer measure body temperature faster.
☒ 3. It ensures accurate reading by keeping the bulb exposed to room air.
☐ 4. It protects the thermometer from breaking easily.

Q.60 An engineer is updating a schematic for a control panel and needs to indicate a normally closed push button. Which approach best ensures the symbol is universally understood among engineers referring to standard engineering drawings?

- Ans ☐ 1. Substitute the normally closed push button symbol with a general switch symbol
☐ 2. Describe the normally closed push button in words within the schematic diagram clearly
☐ 3. Draw a hand made representation of the push button with a note explaining function
☒ 4. Use the standardized symbol for a normally closed push button as per conventions

Q.61 What will come in place of the question mark (?) in the following equation if '+' and '-' are interchanged and 'x' and '÷' are interchanged?

$$42 \times 6 \div 7 - 35 + 19 = ?$$

- Ans ☐ 1. 69
☒ 2. 65
☐ 3. 67
☐ 4. 63

Q.62 The first shopkeeper allows two successive discounts of 3% and 7%, while a second shopkeeper allows two successive discounts of 2% and 8%. A third shopkeeper allows 10% discount on the same item. From which shopkeeper should a customer buy if the marked price is the same at the three shops?

- Ans ☐ 1. Buy from the first shopkeeper
☐ 2. Buy from the first or the second shopkeeper as both are the same.
☐ 3. Buy from the second shopkeeper
☒ 4. Buy from the third shopkeeper

Q.63 A ladder is leaning against a wall and makes an angle of 60° with the ground. If the length of the ladder is 24 m, find the distance of the foot of the ladder from the wall.

- Ans ☐ 1. 9 m
☒ 2. 12 m
☐ 3. 15 m
☐ 4. 18 m

Q.64 In a certain code language, 'SOIL' is coded as '1547' and 'COIL' is coded as '7124'. What is the code for 'C' in the given code language?

- Ans ☐ 1. 7
☒ 2. 2
☐ 3. 1
☐ 4. 4

Q.65 A cyclist travels 120 km in 3 hours, rests for 1 hour, and then travels another 80 km in 2 hours. To determine the cyclist's average speed for the entire journey, which of the following quantities should be used?

- Ans ☐ 1. Change in velocity divided by total time taken
☐ 2. Total displacement divided by total time taken
☒ 3. Total distance travelled divided by the total time taken
☐ 4. Distance travelled in a particular direction divided by time

Q.66 A plane parallel to the base divides a cone of height 40 cm into two parts. If the volume of the upper smaller cone formed is $\frac{1}{64}$ of the volume of the original cone, calculate the height of the plane from the base of the cone.

- Ans ☐ 1. 10 cm
☒ 2. 30 cm
☐ 3. 20 cm
☐ 4. 40 cm

Q.67 Which color is universally associated with emergency exit signs in industrial workplaces under international standards?

- Ans ☐ 1. Red background with white text or symbols
☐ 2. Yellow background with black text or symbols
☒ 3. Green background with white text or symbols
☐ 4. Blue background with white text or symbols

Q.68 A question is followed by two statements numbered (I) and (II). You have to decide whether the data provided in the statements are sufficient to answer the question. Read both the statements and decide the appropriate answer.

Among 5 sticks, B, U, N, M and D, each having a different height, which stick is the shortest?

(I) D is shorter than U. M is shorter than B.

(II) M is taller than D.

- Ans ☐ 1. Data in statement I alone is sufficient to answer the question while data in statement II is not
☐ 2. Both statements I and II together (and not statement I alone or statement II alone) are sufficient to answer the question
☒ 3. Both statements I and II together are NOT sufficient to answer the question
☐ 4. Data in statement II alone is sufficient to answer the question while data in statement I is not

Q.69 The price of sugar is increased by 20%. Manoj can increase his expenditure on sugar by only 15% from his income. In order to balance his expenditure, by what percentage should he reduce the quantity of sugar consumed?

- Ans ☐ 1. $5\frac{1}{3}\%$
☒ 2. $4\frac{1}{6}\%$
☐ 3. 5%
☐ 4. 6.5%

Q.70 A dealer buys a table for ₹2,750. He first marks it up by 28%, then allows a 12% discount to a customer. If the customer also pays 5% GST on the selling price, find the profit percentage (excluding GST) made by the dealer.

- Ans ☒ 1. 13.81%
☒ 2. 12.64%
☒ 3. 15.12%
☒ 4. 10.36%

Q.71 Which of the following pairs of numbers is co-prime?

- Ans ☒ 1. (21, 33)
☒ 2. (14, 28)
☒ 3. (17, 54)
☒ 4. (28, 49)

Q.72 A cyclist rides 60 meters north, then 80 meters south, and finally 70 meters north. What is the total distance the cyclist has traveled?

- Ans ☒ 1. 60 meters
☒ 2. 10 meters
☒ 3. 150 meters
☒ 4. 210 meters

Q.73 12 is related to 1730 following a certain logic. Following the same logic, 13 is related to 2199. To which of the given options is 11 related, following the same logic?
(NOTE: Operations should be performed on the whole numbers, without breaking down the numbers into their constituent digits. E.g. 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.)

- Ans ☒ 1. 1443
☒ 2. 1543
☒ 3. 1433
☒ 4. 1333

Q.74 Read the given statement(s) and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statement(s).

Statements:
Some rugs are fans.
No fan is a car.

Conclusion (I) : Some rugs are cars.
Conclusion (II) : Some fans are rugs.

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

Q.75 Which of the following best describes the function of a speedometer in a vehicle?

- Ans ☒ 1. It displays the current speed at which the vehicle is moving.
☒ 2. It measures the total distance the vehicle has traveled.
☒ 3. It shows the rate at which the vehicle's speed changes.
☒ 4. It calculates the average speed over a journey.

Q.76 Find the compound interest on ₹5,70,000 for 1.5 years at 10% per annum compounded half-yearly.

- Ans ☒ 1. ₹92,846.25
☒ 2. ₹88,846.25
☒ 3. ₹89,846.25
☒ 4. ₹89,946.25

Q.77 Seven boxes S, T, U, V, W, X, and Y are kept one over the other but not necessarily in the same order. U is kept exactly third from the top. Only one box is kept between U and T. W is kept immediately above T. Only three boxes are kept between X and S. V is kept on one of the positions below Y. Only two boxes are kept between U and S. Which box is kept second from the top?

- Ans ☒ 1. T
☒ 2. U
☒ 3. X
☒ 4. V

Q.78 What is the primary color used in warning signs to alert workers of potential hazards?

- Ans ☒ 1. Green with white symbol or text
☒ 2. Blue with white symbol or text
☒ 3. Red with white symbol or text
☒ 4. Yellow with black symbol or text

Q.79 In a certain code language,
A + B means 'A is the mother of B',
A - B means 'A is the brother of B',
A × B means 'A is the wife of B' and
A % B means 'A is the father of B'.

How is Satish related to Mayank if 'Satish + Deep × Piyush - Hitesh % Mayank'?

- Ans ☒ 1. Mother's brother's wife's sister
☒ 2. Father's brother's wife's sister
☒ 3. Mother's brother's wife's mother
☒ 4. Father's brother's wife's mother

Q.80 A 42-litre solution has sugar and water in the ratio 2 : 5. If, due to evaporation, the volume is reduced by 35%, and only water evaporates, what is the new ratio of sugar to water?

- Ans ☒ 1. 31 : 50
☒ 2. 40 : 41
☒ 3. 51 : 42
☒ 4. 40 : 51

Q.81 A crane lifts a 200 kg load to a height of 15 meters in 10 seconds. Assuming acceleration due to gravity is 10 m/s² and energy loss is negligible, what is the power output of the crane during this operation?

- Ans ☒ 1. 3000 W
☒ 2. 2000 W
☒ 3. 1000 W
☒ 4. 1500 W

Q.82 Select the pair which follows the same pattern as that followed by the two pairs given below. Both pairs follow the same pattern.

ZOT - TLP
NIL - HFH

- Ans ☒ 1. BCD - VZZ
☒ 2. BOC - VZT
☒ 3. ABD - VZZ
☒ 4. VZZ - BCD

Q.83 Seven boxes, P, Q, S, T, U, V, and W, are kept one over the other, but not necessarily in the same order. There are exactly two boxes between T and P. Only Q is kept above U. No box is kept below P. S is kept somewhere below W but above V. Based on the given information, which box is kept third above V?

- Ans ☒ 1. W
☒ 2. P
☒ 3. S
☒ 4. T

Q.84 Which one of the following statements correctly describes a characteristic of WANs?

- Ans ☒ 1. WANs are limited to connecting devices within a radius of 1 to 2 km.
☒ 2. WANs typically use only wireless media to connect distant LANs.
☒ 3. WANs can be built by connecting multiple LANs via wired or wireless links.
☒ 4. WANs are always public networks managed solely by Internet Service Providers (ISPs).

Q.85 What does the term 'HAZOP' stand for in occupational safety?

- Ans ☒ 1. Handling and Organizing Safety
☒ 2. Hazardous Operation Standard
☒ 3. Hazardous Operations Safety
☒ 4. Hazard and Operability Study

Q.86 Based on the English alphabetical order, three of the following four letter-cluster pairs are alike in a certain way and thus form a group. Which letter-cluster pair DOES NOT belong to that group?

(Note: The odd one out is not based on the number of consonants/vowels or their position in the letter-cluster.)

- Ans ☒ 1. DG - EH
☒ 2. SJ - TK
☒ 3. IT - KV
☒ 4. KE - LF

Q.87 What should come in place of '?' in the given series?
11, 22, 44, 88, 176, ?

- Ans ☒ 1. 358
☒ 2. 352
☒ 3. 356
☒ 4. 342

Q.88 A solid right circular cone is 7 cm high, and the radius of its base is 22.2 cm. It is melted and recast into a right circular cone with radius of its base 3.7 cm. Then the height (in cm) of the cone is ____.

- Ans ☒ 1. 185
☒ 2. 267
☒ 3. 159
☒ 4. 252

Q.89 An article is bought for ₹300 and its price is increased by 5.5%. The resulting price is then reduced by 8%. Find the final selling price.

- Ans ☒ 1. ₹296.46
☒ 2. ₹284.45
☒ 3. ₹291.18
☒ 4. ₹288.24

Q.90 A technician needs to select a fuse wire for a room heater. Which property should be considered most important for safety based on the heating effect of electric current?

- Ans ☒ 1. The fuse wire must have a low melting point to break the circuit during excess current.
☒ 2. The fuse wire must have a high melting point for durability.
☒ 3. The fuse wire must have a shiny surface for efficient cooling.
☒ 4. The fuse wire must have high resistance and be thick to prevent melting.

Q.91 Which type of personal protective equipment is most suitable for tasks involving airborne chemical particles in confined spaces?

- Ans ☒ 1. Respiratory protection devices such as half-face masks
☒ 2. Body protection with flame-retardant suits
☒ 3. Hand protection using chemical-resistant gloves
☒ 4. Head protection with industrial-grade hard hats

Q.92 The salary of a person is increased by 10%, 20% and 25% successively in three consecutive years. Find the overall percentage increase in the salary at the end of the third year.

- Ans ☒ 1. 65%
☒ 2. 60%
☒ 3. 30%
☒ 4. 50%

Q.93 Two sets of numbers are given below. In each set of numbers, certain mathematical operation(s) on the first number result(s) in the second number. Similarly, certain mathematical operation(s) on the second number result(s) in the third number and so on. Which of the given options follows the same set of operations as in the given sets?

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

6 – 16 – 23 – 32; 7 – 19 – 26 – 35

- Ans ☒ 1. 11 – 31 – 38 – 29
☒ 2. 4 – 14 – 21 – 30
☒ 3. 8 – 22 – 15 – 24
☒ 4. 12 – 34 – 41 – 50

Q.94 Which of the following statements best describes a triangle as used in engineering drawing?

- Ans ☒ 1. A triangle must always have all sides of equal length.
☒ 2. A triangle is a polygon having three curved sides.
☒ 3. A triangle is a polygon with four straight sides and four angles.
☒ 4. A triangle is a polygon with three straight sides and three angles.

Q.95 What does CPU stand for in computing?

- Ans ☒ 1. Central Processing Unit
☒ 2. Computer Processing Unit
☒ 3. Control Processing Unit
☒ 4. Core Processing Unit

Q.96 Which factor increases the amount of heat produced in a wire when an electric current flows through it for a fixed time?

- Ans ☒ 1. Making the wire thicker
☒ 2. Increasing the resistance of the wire
☒ 3. Reducing the current in the wire
☒ 4. Decreasing the length of the wire

Q.97 Which statement best describes the front view in an engineering drawing?

- Ans ☐ 1. It shows only one dimension of the object
☐ 2. It shows the object's depth and height as seen from the side
☐ 3. It shows only the object's bottom or right side
☒ 4. It shows the object's height and width as seen from the front

Q.98 Why does restricting certain chemical refrigerants effectively reduce damage to the ozone layer?

- Ans ☐ 1. Refrigerants emit greenhouse gases that warm the stratosphere.
☐ 2. Refrigerants increase oxygen production, supporting ozone recovery.
☒ 3. Refrigerants release substances that catalyze ozone breakdown.
☐ 4. Refrigerants contain particles that absorb harmful UV light.

Q.99 What should come in place of the question mark (?) in the given series?

1 2 7 20 61 ?

- Ans ☐ 1. 185
☐ 2. 181
☒ 3. 182
☐ 4. 183

Q.100 Let C be a circle, and AB and DE be two chords on C such that AB = BE. In the quadrilateral ABED, let AE and BD intersect at F, $\angle DBE = 55^\circ$ and $\angle BAE = 40^\circ$. Find $\angle FED$.

- Ans ☐ 1. 55°
☐ 2. 110°
☐ 3. 60°
☒ 4. 45°

Section : Part B (Armature & Coil Winder)

Q.101 What is the most significant insulation property of leatheroid paper used in rewinding of AC motor windings?

- Ans ☐ 1. It provides low electrical insulation resistance for rapid heat dissipation in winding assemblies
☒ 2. It provides improved ageing resistance and high dielectric strength for winding insulation applications
☐ 3. It provides high magnetic permeability for improved alternating current motor flux distribution
☐ 4. It provides conductive bonding characteristics for direct electrical connection between winding layers

Q.102 Which material is used as insulation on winding wires in conductors?

- Ans ☐ 1. Paper wrapping
☐ 2. Rubber sheathing
☐ 3. Cotton braiding
☒ 4. Enamel coating

Q.103 A technician is tasked with installing earthing for a commercial building using the plate earthing method. Which sequence of steps ensures safety and long-term effectiveness during the installation process?

- Ans ☐ 1. Dig deep pit, place plate without connecting earth wire, fill with stones and soil
☐ 2. Dig shallow trench, lay plate horizontally, connect earth wire, cover with sand only
☒ 3. Excavate pit, place plate vertically, connect earth wire, fill with alternate charcoal and salt layers
☐ 4. Excavate pit, place plate diagonally, connect earth wire, fill with only soil

Q.104 What is the technical purpose of preheating an electrical machine winding before varnish impregnation during final assembly?

- Ans ☒ 1. To remove absorbed moisture from insulation and winding layers before varnish impregnation
☐ 2. To permanently increase varnish fluidity after curing
☐ 3. To thermally strengthen conductor insulation by direct heat treatment
☐ 4. To increase the direct current resistance of the winding conductor

Q.105 Which method is effective for improving earth resistance in an earthing system?

- Ans ☐ 1. Using a single deep electrode
☐ 2. Connecting earth wire directly to neutral
☒ 3. Adding multiple earth electrodes
☐ 4. Applying oil to the earth pit

Q.106 In a DC shunt generator, the field winding is connected _____.

- Ans ☐ 1. In series with armature
☐ 2. In series with load
☐ 3. Independently from armature
☒ 4. In parallel with armature

Q.107 During final testing of a fully assembled electrical machine after impregnation and balancing, what is the primary objective of conducting a temperature rise test under rated operating conditions?

- Ans ☒ 1. To verify dielectric insulation resistance characteristics between winding conductors and frame
☒ 2. To verify that winding and machine temperatures remain within specified insulation-class thermal limits
☒ 3. To verify correct electrical phase relationship and stator winding terminal polarity
☒ 4. To verify dynamic mechanical stability of the rotating assembly during continuous operation

Q.108 What is the function of the no-voltage coil (NVC) in a DC motor starter?

- Ans ☒ 1. Increase torque
☒ 2. Protect against overload
☒ 3. Increase speed
☒ 4. Protect against supply failure

Q.109 During the transformer transformation ratio test performed in the Impregnation, Balancing, and Final Assembly stage, how should the secondary winding be connected while the rated test voltage is applied to the primary winding?

- Ans ☒ 1. Kept open-circuited without any external electrical load connection
☒ 2. Connected to an external resistive load bank during voltage application
☒ 3. Kept short-circuited through a low-resistance conductive path
☒ 4. Connected to earth potential through one secondary terminal during measurement

Q.110 During the Class E motor stator winding impregnation process, after varnish draining, the stator is heated to 120°C for two hours and then to 140°C for a minimum of ten hours. To satisfy the post-baking inspection requirement, the insulation resistance measured immediately after baking shall not be less than:

- Ans ☒ 1. 2 megaohms
☒ 2. 10 kiloohms
☒ 3. 100 megaohms
☒ 4. 500 ohms

Q.111 When two dimension lines must be close together, what is the best practice to avoid misinterpretation?

- Ans ☒ 1. Placing dimension figures together in straight alignment
☒ 2. Reducing dimension figure size for closer placement
☒ 3. Omitting one of the required dimension value figures
☒ 4. Staggering dimension figures to improve reading clarity

Q.112 A DC shunt motor shows a sudden increase in speed during operation. What may be the probable cause?

- Ans ☒ 1. Increase in armature resistance
☒ 2. Decrease in supply voltage
☒ 3. Increase in load
☒ 4. Field circuit open or weakened

Q.113 If: $\sin\theta = 5/13$ and θ is an acute angle, find the value of $\cos\theta$.

- Ans ☒ 1. 13/12
☒ 2. 12/5
☒ 3. 12/13
☒ 4. 5/12

Q.114 In the context of liquid insulation materials, what is the probable effect when solid impurities align themselves along the electric field?

- Ans ☒ 1. It increases the chances of insulation breakdown
☒ 2. It enhances the dielectric strength of the liquid
☒ 3. It strengthens the insulation against breakdown
☒ 4. It reduces the possibility of insulation failure

Q.115 In a transformer tap changer, changing the tap position directly alters which transformer parameter?

- Ans ☒ 1. Effective turns ratio of the transformer
☒ 2. Frequency of operation
☒ 3. Core material permeability
☒ 4. Magnetic flux waveform shape

Q.116 Which of the following is a type of riveted joint?

- Ans ☒ 1. Seam joint
☒ 2. Groove joint
☒ 3. Edge joint
☒ 4. Lap joint

- Q.117** A technician must choose the most suitable conductor for wiring in a high-temperature industrial environment. Considering mechanical strength, electrical conductivity, and resistance to corrosion, which material offers the best overall performance for long-term reliability?
- Ans ☒ 1. Aluminum wire
☒ 2. Iron wire
☒ 3. Copper wire
☒ 4. Steel wire
-
- Q.118** During pre-varnish thermal conditioning of electric motor windings in the impregnation and balancing process, what is the effect of excessive preheating duration?
- Ans ☒ 1. Complete elimination of winding moisture content
☒ 2. Increase in mechanical rigidity of conductor insulation
☒ 3. Thermal degradation of winding insulation material
☒ 4. Acceleration of varnish polymerization before impregnation
-
- Q.119** In a three-phase alternator, which winding type is commonly used to achieve a sinusoidal output voltage and reduce harmonics?
- Ans ☒ 1. Wave winding
☒ 2. Full-pitch winding
☒ 3. Short-pitch winding
☒ 4. Lap winding
-
- Q.120** What is the effect of rapid deterioration of air-drying varnishes during storage on their service performance?
- Ans ☒ 1. They lose their intended insulating and protective performance characteristics over time
☒ 2. They become completely transparent and free from volatile odor compounds
☒ 3. They cure into a permanently hardened glass-like insulating layer
☒ 4. They develop improved resistance to petroleum-based insulating oils
-
- Q.121** Which of the following methods is recommended for extending the range of a 5A ammeter to measure currents up to 100A?
- Ans ☒ 1. By connecting a resistance of suitable value in series with the ammeter
☒ 2. By connecting a shunt resistance of suitable value in parallel with the ammeter
☒ 3. By connecting multiplier resistor in series with the ammeter
☒ 4. By connecting current transformer in series with the ammeter
-
- Q.122** A single phasing preventer is installed for protecting:
- Ans ☒ 1. Universal motor operated appliances
☒ 2. Three-phase induction motor circuits
☒ 3. Direct current shunt motor drives
☒ 4. Single-phase induction motor systems
-
- Q.123** Which of the following is the advantage of wave winding condition?
- Ans ☒ 1. High voltage generation
☒ 2. Requires many brushes
☒ 3. High current capacity
☒ 4. Low voltage generation
-
- Q.124** Which statement correctly describes the thermal shrink fitting process used for permanent interference assembly of cylindrical electromechanical components?
- Ans ☒ 1. A cooled inner component is mechanically compressed and inserted into a heated outer component, producing a permanent clearance fit after assembly.
☒ 2. Both mating components are cooled before assembly, producing a permanent interference fit after returning to ambient temperature.
☒ 3. Both mating components are heated uniformly before assembly, producing a clearance fit after cooling to ambient temperature.
☒ 4. A metallic outer component is heated to expand its internal diameter and assembled over a cooler mating component, producing an interference fit after cooling to ambient temperature.
-
- Q.125** What is the role of communication during an industrial system failure?
- Ans ☒ 1. To assign responsibilities only to selected workers
☒ 2. To withhold information from concerned external agencies
☒ 3. To coordinate actions and keep everyone properly informed
☒ 4. To communicate details only with higher management staff
-
- Q.126** What type of tachometer uses changes in frequency to measure rotational speed?
- Ans ☒ 1. Mechanical tachometer
☒ 2. Electronic tachometer
☒ 3. Analog tachometer
☒ 4. Thermal tachometer
-

Q.127 An electrical workshop uses 15 lamps of 100 W each for 5 hours daily. If the workshop operates 25 days in a month, what is the total energy consumed in kilowatt-hours (kWh) per month?

- Ans ☐ 1. 150.0
☒ 2. 187.5
☐ 3. 125.0
☐ 4. 112.5

Q.128 Which property of a resistor determines how much it resists the flow of electric current?

- Ans ☐ 1. Inductance
☐ 2. Capacitance
☒ 3. Resistance
☐ 4. Conductance

Q.129 Why is HV testing performed after insulation resistance (IR) test?

- Ans ☐ 1. To measure current
☐ 2. To reduce voltage
☒ 3. To avoid damage due to weak insulation.
☐ 4. To increase efficiency

Q.130 Which of the following numbers has a square root that is irrational?

- Ans ☐ 1. 25
☐ 2. 16
☒ 3. 20
☐ 4. 36

Q.131 Which of the following is a disadvantage of a single-phase system compared with a three-phase system?

- Ans ☐ 1. It is more stable under heavy load
☐ 2. It has lower losses
☐ 3. It is better for large motors
☒ 4. It delivers less power for the same current rating

Q.132 A maintenance engineer must select a varnish for an emergency field rewinding repair of a three-phase AC motor at a remote site without access to baking equipment. Which varnish type is most suitable for rapid restoration of motor operation?

- Ans ☐ 1. Solventless epoxy impregnation varnish requiring specialized processing equipment for curing
☒ 2. Air-drying shellac spirit varnish allowing rapid insulation drying under ambient conditions
☐ 3. Thermosetting baking varnish requiring controlled heat curing for insulation hardening
☐ 4. Oleoresinous baking varnish requiring prolonged thermal curing for impregnation stability

Q.133 A technician is making a former for diamond winding used in a transformer. Which step is essential for achieving the desired coil shape?

- Ans ☐ 1. Maintaining uniform winding tension throughout the coil
☐ 2. Applying a protective coating to the former surface
☒ 3. Forming precise angles and dimensions at the coil corners
☐ 4. Selecting thicker insulation material for the winding wire

Q.134 Which statement correctly defines the function of a jig in electromechanical assembly and machining operations?

- Ans ☐ 1. Supporting rotating machine elements during machining operations
☐ 2. Rigidly supporting the workpiece without guiding the cutting tool
☐ 3. Temporarily applying holding force during assembly operations
☒ 4. Securely holding the workpiece and accurately guiding the cutting tool

Q.135 Which of the following best describes the dual role of stakes in sheet metal work?

- Ans ☐ 1. They serve as heating and bending tools
☐ 2. They serve as cutting and welding tools
☐ 3. They serve as measuring and marking tools
☒ 4. They serve as supporting and forming tools

Q.136 Which operating condition produces positive voltage regulation in an alternator?

- Ans ☐ 1. Leading power factor load condition
☐ 2. Zero excitation operating condition
☒ 3. Lagging power factor load condition
☐ 4. No load open circuit condition

Q.137 A vertical tower standing on level ground casts a shadow 15 m long when the angle of elevation of the Sun from the ground is 45° . Find the height of the tower.

- Ans ☒ 1. 15 m
☒ 2. 12 m
☒ 3. 10 m
☒ 4. 18 m

Q.138 Which equipment is used to maintain controlled and uniform tension on the insulated winding wire during the stator rewinding process of a three-phase alternating current motor?

- Ans ☒ 1. Soldering station with insulated terminal attachments
☒ 2. Manual wire pulling arrangement without tension control
☒ 3. Wire reel stand equipped with an adjustable tensioning mechanism
☒ 4. Digital voltmeter configured for continuity measurement

Q.139 Which fundamental law states the conversion of mechanical energy into electrical energy with reference to a DC generator?

- Ans ☒ 1. Coulomb's Law
☒ 2. Faraday's Law of Electromagnetic Induction
☒ 3. Thermal Conduction
☒ 4. Mechanical Resonance

Q.140 A workshop uses $\frac{3}{5}$ m of wire for each identical coil. Find the total wire required to make 15 coils.

- Ans ☒ 1. 8 m
☒ 2. 7 m
☒ 3. 9 m
☒ 4. 6 m

Q.141 Complete the statement: The working principle of a DC generator is based on _____.

- Ans ☒ 1. Electrostatic induction
☒ 2. Mutual induction
☒ 3. Electromagnetic induction
☒ 4. Self-induction

Q.142 What is the main function of a single-phase transformer in an AC electrical circuit?

- Ans ☒ 1. To store electrical energy magnetically
☒ 2. To generate AC voltage at fixed frequency
☒ 3. To change AC voltage at the same frequency
☒ 4. To convert AC voltage into DC voltage

Q.143 Which of the following is a direct benefit of implementing safety standards at work?

- Ans ☒ 1. Increased employee working hours during production
☒ 2. Higher financial taxes imposed on company employees
☒ 3. Reduced duration of scheduled employee lunch breaks
☒ 4. Reduced likelihood of workplace injuries and accidents

Q.144 A technician performs insulation resistance testing on a single-phase induction motor using a Megger. Which set of measurements is correctly recorded in the insulation resistance table?

- Ans ☒ 1. Phase to neutral, phase to phase, and neutral to earth
☒ 2. Armature to commutator, brush to spring, and shaft to body
☒ 3. Body to starting winding, body to running winding, and between windings
☒ 4. Starter to fuse, switch to relay, and cable to terminal

Q.145 Which maintenance step ensures a draw spike remains effective for pattern withdrawal?

- Ans ☒ 1. Moistening the surface before each use
☒ 2. Keeping it straight and checking for wear
☒ 3. Applying oil to the surface regularly
☒ 4. Sharpening the tip and polishing regularly

Q.146 A 3-phase AC machine winding is designed with a coil span of 150 degrees electrical instead of 180 degrees. Which statement best describes the outcome?

- Ans ☒ 1. The fundamental EMF is increased substantially
☒ 2. The third harmonic EMF is minimized in the output voltage
☒ 3. The phase sequence of the machine is reversed
☒ 4. The winding resistance is reduced significantly

Q.147 Which single-phase motor is preferred for sewing machines requiring high-speed operation?

- Ans
- ☐ 1. Squirrel cage motor
 - ☐ 2. Reluctance motor
 - ☒ 3. Universal motor
 - ☐ 4. Shaded pole motor

Q.148 Consider a 4-pole DC generator with a lap winding. If each parallel path carries 20 A, what is the total armature current?

- Ans
- ☐ 1. 60 A
 - ☒ 2. 80 A
 - ☐ 3. 20 A
 - ☐ 4. 40 A

Q.149 In a workshop, a technician receives a written instruction containing job details, quantity, and delivery date before starting work. What is this document called?

- Ans
- ☐ 1. Material return slip
 - ☐ 2. Attendance register
 - ☒ 3. Job order
 - ☐ 4. Inspection tag

Q.150 What is the purpose of name plate fixing during the Impregnation, Balancing, and Final Assembly stage of an electrical machine?

- Ans
- ☐ 1. To provide additional mechanical reinforcement for rotating and stationary assembly components
 - ☒ 2. To provide standardized equipment identification and rated operating specifications for the assembled electrical machine
 - ☐ 3. To provide dynamic balancing correction for the rotating assembly during high-speed operation
 - ☐ 4. To provide supplementary electrical insulation between energized conductive machine components

Q.151 Why is alternating voltage commonly generated in large power stations?

- Ans
- ☒ 1. Because rotating alternators naturally produce sinusoidal alternating emf
 - ☐ 2. Because batteries directly produce alternating voltage
 - ☐ 3. Because alternating voltage produces no heating loss
 - ☐ 4. Because DC voltage cannot be converted into AC voltage

Q.152 During manual coil winding handling procedures for a split-phase induction motor stator, which sequence correctly follows standard winding practice?

- Ans
- ☐ 1. Remove conductor insulation, wind all stator coils, and terminate end connections
 - ☐ 2. Start with the outermost coil, insert slot wedges, and wind remaining stator coils
 - ☒ 3. Wind the innermost coil first, continue with progressively larger coils, and bring out end connections
 - ☐ 4. Insert insulating guide paper, wind all stator coils simultaneously, and clamp winding ends

Q.153 In a purely capacitive AC circuit, what is the power factor value?

- Ans
- ☒ 1. 0
 - ☐ 2. 1
 - ☐ 3. -1
 - ☐ 4. 0.5

Q.154 Which sequence correctly describes the standard order of making end connections during rewinding of a three-phase AC motor stator winding?

- Ans
- ☐ 1. First coil-group connections, then terminal lead connections, and finally inter-coil connections
 - ☐ 2. First terminal lead connections, then coil-group connections, and finally inter-coil connections
 - ☐ 3. First terminal lead connections, then inter-coil connections, and finally coil-group connections
 - ☒ 4. First inter-coil connections, then coil-group connections, and finally terminal lead connections

Q.155 How is the correctness of a three-phase delta winding connection verified during the Final Assembly stage of rotating electrical machine manufacturing?

- Ans
- ☐ 1. By measuring winding resistance between each line terminal and a neutral connection point
 - ☒ 2. By confirming phase continuity and closed-loop electrical paths between all phase terminal pairs
 - ☐ 3. By measuring phase voltage between line terminals and an electrical neutral point
 - ☐ 4. By measuring insulation resistance between winding conductors and grounded machine body

Q.156 Which action ensures minimal power consumption by the pressure coil in a dynamometer wattmeter during high-voltage measurements?

- Ans
- ☒ 1. Using a high resistance in series with the pressure coil
 - ☐ 2. Lowering the resistance of the coil
 - ☐ 3. Connecting a low resistance in parallel with the coil
 - ☐ 4. Reducing the number of turns in the coil

Q.157 What does it indicate if an armature rotor, during static balancing, comes to rest at different angular positions after repeated free rolling?

- Ans ☒ 1. An additional balancing counterweight is required on the rotor
☒ 2. The armature rotor is statically balanced
☒ 3. Further static balancing correction is required on the rotor assembly
☒ 4. The armature winding resistance distribution is electrically nonuniform

Q.158 A drafter must select between vertical and inclined lettering. According to engineering drawing standards, what is the recommended angle for inclined lettering?

- Ans ☒ 1. Inclined at 60 degrees to the horizontal
☒ 2. Inclined at 90 degrees to the horizontal
☒ 3. Inclined at 75 degrees to the horizontal
☒ 4. Inclined at 45 degrees to the horizontal

Q.159 A Megger is an instrument which is used to measure _____.

- Ans ☒ 1. Insulation resistance
☒ 2. Current
☒ 3. Voltage
☒ 4. Capacitance

Q.160 Why is Insulation Resistance test performed before DC HiPot (High Potential) test on a DC machine winding?

- Ans ☒ 1. To calculate fixed losses
☒ 2. To increase the test voltage
☒ 3. To reduce testing time
☒ 4. To ensure insulation can withstand high voltage

Q.161 Which pre-rewinding test result most strongly indicates that the existing winding insulation of an AC motor has deteriorated to a condition requiring rewinding?

- Ans ☒ 1. Presence of electrical continuity across all winding terminals during continuity verification testing
☒ 2. Stable conductor resistance value obtained during low-voltage resistance measurement testing
☒ 3. Minor imbalance in phase winding resistance measured under ambient temperature conditions
☒ 4. Significant reduction in insulation resistance value under specified direct voltage testing conditions

Q.162 Which statement describes chlorinated hydrocarbons as used in electrical insulation?

- Ans ☒ 1. They are gaseous insulants commonly referred to as silicone oil.
☒ 2. They are synthetic liquid insulants commercially called Askarel.
☒ 3. They are natural solid insulants used as mineral oil.
☒ 4. They are ceramic-based insulants known as mica.

Q.163 Why is Aluminium less preferred than Copper for DC machine windings?

- Ans ☒ 1. Higher melting point
☒ 2. Higher resistivity
☒ 3. Lower density
☒ 4. Better conductivity

Q.164 Complete the following statement with regards to DC machine.
Wave winding is used for _____.

- Ans ☒ 1. high voltage, low current applications
☒ 2. low voltage, high current applications
☒ 3. only high current applications
☒ 4. low speed machines

Q.165 What does a symbol with a circle and a cross inside usually indicate in an electrical schematic?

- Ans ☒ 1. Lamp
☒ 2. Fuse
☒ 3. Resistor
☒ 4. Ground

Q.166 An alternator has total losses of 8 kW when supplying an output of 192 kW. What is the efficiency of the alternator?

- Ans ☒ 1. 94%
☒ 2. 96%
☒ 3. 92%
☒ 4. 98%

Q.167 Which condition defines a balanced load in a three-phase electrical system?

- Ans
- ✓ 1. All phase currents have equal magnitude and are 120 degrees apart
 - ✗ 2. All phase currents are unequal and randomly phased
 - ✗ 3. One phase has zero current while others have current
 - ✗ 4. All phase currents are in phase with each other

Q.168 Which of the following options defines a fractional horsepower (FHP) motor?

- Ans
- ✗ 1. A motor rated below one Watt output power
 - ✗ 2. A motor operating above 1000 r.p.m speed only
 - ✓ 3. A motor rated below one horsepower output power
 - ✗ 4. A motor operating only with direct current supply

Q.169 In wave winding, what is the consequence if the front and back pitches are not odd numbers?

- Ans
- ✓ 1. Improper commutation
 - ✗ 2. Increased voltage
 - ✗ 3. Better efficiency
 - ✗ 4. Reduced speed

Q.170 What is the primary purpose of using an MCB (Miniature Circuit Breaker) in an electrical wiring system?

- Ans
- ✗ 1. To provide backup power during outages
 - ✗ 2. To control the current flow during normal operation
 - ✗ 3. To increase the voltage supplied to devices
 - ✓ 4. To automatically switch off electrical supply in case of overload or short circuit

Q.171 A 24 V battery is connected in series with 3 Ω and 5 Ω resistors. Calculate the power dissipated by the 5 Ω resistor.

- Ans
- ✗ 1. 72 watts
 - ✗ 2. 24 watts
 - ✗ 3. 60 watts
 - ✓ 4. 45 watts

Q.172 How does vacuum pressure impregnation of stator or rotor windings contribute to the long-term reliability of electrical machinery?

- Ans
- ✗ 1. By actively controlling the operating temperature of the electrical machine
 - ✗ 2. By increasing the physical cross-sectional area of the conductor windings
 - ✗ 3. By reducing the manufacturing assembly time of the electrical machine
 - ✓ 4. By preventing moisture ingress, improving insulation bonding, and reducing partial discharge within windings

Q.173 During stator rewinding of a three-phase alternating current induction motor, what is the primary function of the guide paper inserted inside stator slots before coil placement?

- Ans
- ✗ 1. To increase magnetic flux density within the stator core structure
 - ✗ 2. To provide an electrically conductive path between adjacent stator slot surfaces
 - ✓ 3. To prevent mechanical abrasion of winding conductors during coil insertion into stator slots
 - ✗ 4. To provide a thermal cooling medium for stator winding heat dissipation

Q.174 When treating a suspected fracture at work, which basic first aid action should be avoided?

- Ans
- ✗ 1. Immobilize the injured limb with a splint
 - ✗ 2. Call for professional medical help promptly
 - ✗ 3. Support the area above and below the injury
 - ✓ 4. Attempt to realign the bone manually at that moment

Q.175 Which of the following best describes a regular hexagon as used in the engineering drawing of geometrical figures?

- Ans
- ✗ 1. A six-sided polygon with only opposite sides equal
 - ✗ 2. A six-sided polygon with equal sides but unequal angles
 - ✓ 3. A six-sided polygon with equal sides and equal angles
 - ✗ 4. A six-sided polygon with unequal sides