



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 | Refrigeration & AC Mechanic

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 (Refrigeration & AC Mechanic) (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	Refrigeration & AC Mechanic
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 (Refrigeration & AC Mechanic)

Q.101 Earthing provides a low-resistance path for:

- Ans ☒ 1. Load current during normal operation
☒ 2. Fault current under abnormal conditions
☒ 3. Voltage regulation current
☒ 4. Magnetic field circulation

Q.102 If an object is placed in the third quadrant, what is the relative position of the horizontal plane (HP) and the vertical plane (VP) with respect to the object?

- Ans ☒ 1. Object is below HP and behind VP
☒ 2. Object is below HP and in front of VP
☒ 3. Object is above HP and behind VP
☒ 4. Object is above HP and in front of VP

Q.103 In a soldering operation, which of the following is the base metal?

- Ans
- ✓ 1. Two copper wires being connected together
 - ✗ 2. The flux used to remove surface oxides
 - ✗ 3. The solder material applied between wires
 - ✗ 4. The layer of insulation on the wires

Q.104 If the number of turns in an inductor coil is doubled while keeping the core material, length, and cross-sectional area the same, what happens to its self-inductance?

- Ans
- ✗ 1. It remains unchanged
 - ✗ 2. It becomes twice the original value
 - ✗ 3. It becomes half of the original value
 - ✓ 4. It becomes four times the original value

Q.105 What is the primary function of an electronic hygrometer in air-conditioning systems?

- Ans
- ✗ 1. To measure the refrigerant temperature
 - ✗ 2. To measure the air velocity in ducts
 - ✓ 3. To measure the relative humidity of air
 - ✗ 4. To measure the atmospheric pressure

Q.106 Which component senses the temperature to operate a thermostatic expansion valve?

- Ans
- ✗ 1. Solenoid coil
 - ✗ 2. Pressure switch
 - ✗ 3. Evaporator fan
 - ✓ 4. Sensing bulb

Q.107 Which feature of an insulation tester allows it to evaluate the quality of insulation in electrical wiring?

- Ans
- ✗ 1. It measures frequency of alternating current supply in the insulation circuit
 - ✓ 2. It applies a high direct current voltage across insulation to measure resistance
 - ✗ 3. It measures insulation thickness by direct contact for checking proper insulation
 - ✗ 4. It provides continuity checks for all insulations across conductors

Q.108 If a circular sheet has a radius of 14 cm, what is the area of a sector with a central angle of 90 degrees?

- Ans
- ✗ 1. 77 square centimeters
 - ✓ 2. 154 square centimeters
 - ✗ 3. 66 square centimeters
 - ✗ 4. 308 square centimeters

Q.109 A service vehicle travels 40 meters north, then 30 meters south in 14 seconds. What is the average velocity of the vehicle?

- Ans
- ✗ 1. 10 meters per second south
 - ✗ 2. 2.86 meters per second south
 - ✗ 3. 5 meters per second north
 - ✓ 4. 0.71 meters per second north

Q.110 Which material should be used when separating a person from a live electric source during first aid?

- Ans
- ✗ 1. Bare hands are safe to touch and remove the person from source
 - ✓ 2. A dry wooden stick is safe to push the person away from the source
 - ✗ 3. A metal rod is safe to move the person away from the source
 - ✗ 4. A wet cloth is safe to pull the person from the source

Q.111 What is the purpose of the expansion device in the refrigeration cycle?

- Ans
- ✗ 1. It removes unwanted gases and oils from the refrigerant circuit
 - ✗ 2. It increases the pressure of refrigerant before it enters the condenser
 - ✓ 3. It lowers the pressure of the liquid refrigerant before it enters the evaporator
 - ✗ 4. It increases the temperature of the refrigerant before the evaporator

Q.112 In a domestic refrigerator, which drier construction is most suitable for preventing capillary tube blockage caused by moisture contamination?

- Ans
- ✗ 1. Bare coil drier
 - ✗ 2. Open shell drier
 - ✓ 3. Solid core drier
 - ✗ 4. Air vent drier

Q.113 If excessive flux residue remains after a soldering operation, which consequence is most likely to impact the reliability of an electrical connection over time?

- Ans ☒ 1. Thermal failure of the joint with slightly altered joint appearance
☒ 2. Increased risk of corrosion and potential electrical failure at the joint
☒ 3. Noticeably higher melting point of the joint in subsequent heating
☒ 4. Reduced electrical resistance of the soldered connection over time

Q.114 In a series circuit, which electrical quantity remains the same through all components?

- Ans ☒ 1. Current
☒ 2. Power
☒ 3. Resistance
☒ 4. Voltage

Q.115 Which setting on the cabin thermostat would most likely result in maximum compressor cycling and frequent temperature fluctuations?

- Ans ☒ 1. A wide temperature differential setting
☒ 2. Maximum cooling setpoint selected
☒ 3. Minimum cooling setpoint selected
☒ 4. A very narrow temperature differential setting

Q.116 A mechanic working in a confined space with suspected ammonia leakage must choose appropriate respiratory protection. Which of the following actions would be most effective in ensuring safety under these conditions?

- Ans ☒ 1. Select a full-face supplied-air respirator and check for proper fit before entry
☒ 2. Use a half-face respirator with particulate filter and work with a partner
☒ 3. Wear a basic dust mask and ventilate the space with a fan
☒ 4. Choose a filter respirator and perform a short exposure test

Q.117 While analyzing a block diagram of a cold storage refrigeration system, you notice the compressor block is positioned after the condenser. What does this indicate about the system sequence?

- Ans ☒ 1. It represents a dual circuit system
☒ 2. It indicates a parallel flow system
☒ 3. The sequence is incorrect and may disrupt refrigerant flow
☒ 4. The arrangement improves system efficiency

Q.118 When evaluating materials for a spring in a workshop machine, which factor is most critical for ensuring the spring regains its original shape after repeated use?

- Ans ☒ 1. High thermal conductivity
☒ 2. High density to increase structural weight
☒ 3. High elasticity to withstand repeated stress
☒ 4. High ductility to allow permanent bending

Q.119 Which method is most effective for reducing heat load in a commercial building?

- Ans ☒ 1. Adding more interior partitions
☒ 2. Increasing window area
☒ 3. Using darker paint on walls
☒ 4. Increasing roof insulation thickness

Q.120 Porcelain is widely used in overhead line insulators because it has high:

- Ans ☒ 1. Thermal conductivity
☒ 2. Electrical conductivity
☒ 3. Current carrying capacity
☒ 4. Dielectric strength

Q.121 What is the main effect of bending on the grain structure of sheet metal?

- Ans ☒ 1. The grain structure stretches in the middle surface and compresses on the outer surface of bend.
☒ 2. The grain structure stretches on the inner surface of bend and compresses on the outer surface.
☒ 3. The grain structure stretches on the outer surface of bend and compresses on the inner surface.
☒ 4. The grain structure remains unchanged and uniform throughout the sheet after bending operation.

Q.122 A combination plier is being used by a mechanic to hold a copper tube firmly while cutting a copper wire. Which construction feature of the combination plier makes it different from a standard long nose plier for this task?

- Ans ☒ 1. Serrated jaws with side-cutting blade
☒ 2. Cushioned non-slip grip handles
☒ 3. Return spring for automatic opening
☒ 4. Pivot joint with adjustable tension

Q.123 Which of the following units is NOT a part of the SI system?

- Ans ☒ 1. Inch
☒ 2. Newton
☒ 3. Pascal
☒ 4. Kilogram

Q.124 If a compressor is found to be running but not developing pressure, which of the following is a likely cause?

- Ans ☒ 1. Blocked condenser fins reducing airflow
☒ 2. Worn or damaged piston rings
☒ 3. Faulty thermostat in cooling circuit
☒ 4. Dirty evaporator coil restricting circulation

Q.125 How does a pressure switch usually respond when the system pressure rises above its preset limit in an air-conditioning system?

- Ans ☒ 1. It increases fan speed
☒ 2. It closes the electrical circuit
☒ 3. It reduces system voltage
☒ 4. It opens the electrical circuit

Q.126 What is the main function of the evaporator in a commercial air-conditioning system?

- Ans ☒ 1. It circulates air within the conditioned space
☒ 2. It compresses the refrigerant vapor to high pressure
☒ 3. It cools the condenser coils by transferring heat
☒ 4. It absorbs heat from the air passing over its surface

Q.127 A technician needs to show the right side view of an object using third angle projection. Where should this view be located on the drawing sheet relative to the front view?

- Ans ☒ 1. Below the front view
☒ 2. Above the front view
☒ 3. To the right of the front view
☒ 4. To the left of the front view

Q.128 What is the main moving part in a centrifugal compressor called?

- Ans ☒ 1. Valve
☒ 2. Impeller
☒ 3. Piston
☒ 4. Rotor

Q.129 A process that follows a horizontal path to the right on the psychrometric chart corresponds to what change in air properties?

- Ans ☒ 1. Increase in dry bulb temperature at constant humidity ratio
☒ 2. Decrease in humidity ratio at constant temperature
☒ 3. Decrease in dry bulb temperature at constant enthalpy
☒ 4. Increase in humidity ratio at constant temperature

Q.130 A technician replaces a faulty relay in a refrigerator. Which safety step must be performed before this task?

- Ans ☒ 1. Clean the condenser coils thoroughly
☒ 2. Wear rubber gloves for handling tools
☒ 3. Label each wire connected to the compressor
☒ 4. Disconnect the refrigerator from the power supply

Q.131 Which form of energy is transferred between objects due to a temperature difference?

- Ans ☒ 1. Heat
☒ 2. Pressure
☒ 3. Force
☒ 4. Work

Q.132 Which statement accurately describes the temperature range typically used for brazing compared to soldering?

- Ans ☒ 1. Brazing is always done at the melting point of the base metal
☒ 2. Soldering uses a higher temperature range than brazing
☒ 3. Brazing and soldering use the same temperature range
☒ 4. Brazing uses a higher temperature range than soldering

Q.133 A clamp meter with a maximum range of 400 amperes is required to measure current on a circuit expected to draw 500 amperes. What is the most suitable solution to obtain an accurate reading with this meter?

- Ans
- ☐ 1. Add insulation to the conductor before using the clamp meter
 - ☐ 2. Set the clamp meter to the highest available range and measure directly
 - ☒ 3. Use a current transformer to step down the current before measurement
 - ☐ 4. Clamp the meter around two conductors to reduce the current displayed

Q.134 Which part is essential for changing a motor connection from star to delta in a Star Delta Starter used in refrigeration systems?

- Ans
- ☐ 1. Current transformer
 - ☐ 2. Pressure switch
 - ☐ 3. Thermal overload relay
 - ☒ 4. Changeover contactor

Q.135 What is the main function of a deep freezer in commercial refrigeration systems?

- Ans
- ☒ 1. To store products at temperatures below freezing point
 - ☐ 2. To reduce humidity in storage chambers
 - ☐ 3. To increase room temperature in storage areas
 - ☐ 4. To heat food items for serving

Q.136 Which of the following is the function of a package chiller in commercial air conditioning systems?

- Ans
- ☐ 1. To circulate refrigerant through air ducts
 - ☐ 2. To directly produce hot water for sanitary use
 - ☒ 3. To provide chilled water for cooling air in buildings
 - ☐ 4. To generate fresh ventilation air for rooms

Q.137 How would increasing the number of occupants in a conference hall affect its sensible heat load?

- Ans
- ☐ 1. It decreases if the hall is well insulated
 - ☐ 2. It remains unchanged if the hall size is constant
 - ☒ 3. It increases due to additional body heat released
 - ☐ 4. It decreases due to improved air circulation

Q.138 A machine shop calculates the cost of a component as follows: Material cost is 500, labour cost is 400, and overhead is 100. If a 20% profit margin is added to the total cost, what is the selling price?

- Ans
- ☐ 1. 1,300
 - ☐ 2. 1,100
 - ☐ 3. 1,000
 - ☒ 4. 1,200

Q.139 Which is the primary consequence of undersizing an air duct in a central air-conditioning system?

- Ans
- ☐ 1. Higher cooling capacity achieved
 - ☐ 2. Decreased noise in the duct system
 - ☒ 3. Excessive pressure loss and poor airflow
 - ☐ 4. Improved energy efficiency

Q.140 If two refrigeration systems have the same cooling effect, but one has higher work input due to increased friction losses, what happens to their coefficient of performance?

- Ans
- ☐ 1. The system with higher friction losses will have lower coefficient of performance than other system
 - ☐ 2. Both systems have the same coefficient of performance because cooling effects are identical
 - ☒ 3. The system with higher friction losses will have higher coefficient of performance than other system
 - ☐ 4. The system with higher work input always has a coefficient of performance equal to zero

Q.141 What is a common reason for a cold storage room not cooling properly?

- Ans
- ☐ 1. Excessive insulation thickness
 - ☐ 2. Low voltage supply
 - ☐ 3. High outside humidity
 - ☒ 4. Insufficient refrigerant in the system

Q.142 Which factor should be considered first when selecting an expansion valve for a commercial refrigeration system?

- Ans
- ☐ 1. Type of compressor oil
 - ☐ 2. Shape of evaporator
 - ☐ 3. Color of the valve
 - ☒ 4. Required refrigerant flow rate

Q.143 If the refrigerator timer fails and remains stuck in the defrost mode, what is the most likely result?

- Ans
- ☐ 1. Excessive frost formation inside freezer
 - ☐ 2. Continuous light inside refrigerator
 - ☐ 3. Water leakage inside refrigerator
 - ☒ 4. Refrigerator stops cooling properly

Q.144 A customer reports ice formation near the expansion valve and poor cooling performance. After confirming that the valve is partially blocked, what is the best corrective action to restore proper system operation?

- Ans
- ☐ 1. Lower the thermostat setting to reduce ice formation
 - ☐ 2. Add more refrigerant to compensate for reduced cooling
 - ☒ 3. Service the expansion valve and recharge the system
 - ☐ 4. Increase the compressor speed to maintain cooling performance

Q.145 What does the current gain parameter (β) of a transistor represent?

- Ans
- ☐ 1. Ratio of output power to input power in rectifier circuits.
 - ☐ 2. Ratio of emitter voltage to collector voltage during amplification.
 - ☐ 3. Ratio of base resistance to emitter resistance in biasing circuit.
 - ☒ 4. Ratio of collector current to base current in transistor operation.

Q.146 A customer reports frequent water leaks around their water dispenser with a water-cooled condenser. After confirming all connections are tight, what is the next best action to diagnose the issue?

- Ans
- ☐ 1. Increase the water flow rate to the condenser
 - ☒ 2. Inspect the condenser for corrosion or pinhole leaks
 - ☐ 3. Clean the dispenser's outer body thoroughly
 - ☐ 4. Replace the dispenser's water filter element

Q.147 Which type of information does a yellow safety sign provide in a workshop?

- Ans
- ☐ 1. It provides information about the location of first aid kits
 - ☐ 2. It provides information about a safe exit route
 - ☒ 3. It gives a warning to be cautious of possible hazards
 - ☐ 4. It provides a command to wear a safety gear helmet

Q.148 When selecting a tool for removing scale from a water cooler evaporator, which tool-and-method combination ensures effective cleaning without damaging the coil fins?

- Ans
- ☐ 1. Use a steel scraper with abrasive powder applied vigorously
 - ☐ 2. Use a metal file with detergent solution applied vertically
 - ☒ 3. Use a soft nylon fin brush with a low-pressure cleaning method
 - ☐ 4. Use a wire brush with strong acid applied in a circular motion

Q.149 How would increasing the carbon content in a mild steel sheet affect its properties relevant to sheet metal fabrication?

- Ans
- ☐ 1. It would increase corrosion resistance and improve weldability
 - ☒ 2. It would reduce ductility and make the sheet less suitable for forming
 - ☐ 3. It would make the sheet softer and more malleable for forming
 - ☐ 4. It would lower the melting point and increase thermal expansion

Q.150 Which method is used in an indirect air-conditioning system to transfer the cooling effect to air?

- Ans
- ☐ 1. Direct spray of refrigerant into air
 - ☐ 2. Direct expansion coils exposed to air
 - ☐ 3. Refrigerant gas blowers in ducts
 - ☒ 4. Chilled water circulated through coils

Q.151 Which property of hydrocarbon (HC) refrigerants makes it necessary to ensure good ventilation during retrofitting work?

- Ans
- ☐ 1. Corrosiveness of HC refrigerants
 - ☐ 2. High pressure of HC refrigerants
 - ☒ 3. Flammability of HC refrigerants
 - ☐ 4. Toxicity of HC refrigerants

Q.152 In an air conditioning electronic control board, what is the application of a Zener diode compared to a standard rectifier diode?

- Ans
- ☐ 1. It increases the frequency of the incoming control signal to the compressor relay.
 - ☐ 2. It acts as a heavy-duty thermal fuse to cut off power during system overloads.
 - ☐ 3. It is used exclusively to convert high-voltage AC mains into high-voltage DC.
 - ☒ 4. It is used to maintain a constant DC voltage across a load despite variations in input voltage.

Q.153 Which symbol in engineering drawings is used to represent a manually operated valve in a piping diagram?

- Ans ☒ 1. Two short parallel lines with a gap
☒ 2. A line with a hollow circle and no bar
☒ 3. A line with a filled circle and a short perpendicular bar
☒ 4. A single solid line

Q.154 During maintenance, oil samples from an ice candy plant reveal significant moisture contamination. What should be the technician's next action to prevent equipment failure after retrofitting?

- Ans ☒ 1. Increase the amount of refrigerant in the system
☒ 2. Add more lubricating oil to dilute moisture
☒ 3. Replace the filter drier and vacuum the system thoroughly
☒ 4. Switch off the system and leave it to dry naturally

Q.155 Which component in a Variable Refrigerant Flow system is primarily responsible for controlling the flow of refrigerant to multiple indoor units?

- Ans ☒ 1. Solenoid valve
☒ 2. Electronic expansion valve
☒ 3. Mechanical expansion valve
☒ 4. Thermostatic expansion valve

Q.156 How does the wet-bulb temperature change when water evaporates faster from the wet cloth of a psychrometer?

- Ans ☒ 1. It increases above dry bulb temperature
☒ 2. It decreases compared to dry bulb temperature
☒ 3. It remains equal to dry bulb temperature
☒ 4. It exceeds dry bulb temperature

Q.157 Which step should a technician take first when troubleshooting uneven cooling in a frost-free refrigerator with a 3-door air duct circuit?

- Ans ☒ 1. Reduce the freezer temperature setting
☒ 2. Replace the temperature sensor immediately
☒ 3. Add refrigerant to the system
☒ 4. Check for obstructions in the air duct passages

Q.158 Which of the following defines the purpose of using lockout/tagout (LOTO) procedures during maintenance work?

- Ans ☒ 1. To ensure that the maintenance work is completed faster by allowing workers to bypass safety interlocks temporarily
☒ 2. To replace the need for personal protective equipment (PPE) during maintenance activities
☒ 3. To isolate hazardous energy sources and prevent accidental machine start-up, thereby protecting workers from injury
☒ 4. To make report and document equipment downtime for production planning and supervisor approval

Q.159 In the ice candy plant process, what is the primary purpose of the brine solution?

- Ans ☒ 1. To transfer cold temperature to the ice candy moulds
☒ 2. To clean the ice candy moulds
☒ 3. To generate electricity for the plant
☒ 4. To flavor the ice candies

Q.160 When comparing advanced frost free refrigerator models, which specification most enhances the reliability of long-term automatic defrost cycles under varying voltage conditions?

- Ans ☒ 1. Use of analog thermostats for temperature sensing
☒ 2. Enhanced door gaskets for improved insulation
☒ 3. Larger defrost water tray for ice melt collection
☒ 4. Incorporation of voltage stabilizer with microcontroller control

Q.161 Which part of a centrifugal fan directs the airflow outwards after it leaves the impeller?

- Ans ☒ 1. Volute casing
☒ 2. Shaft
☒ 3. Diffuser
☒ 4. Inlet

Q.162 What is the main function of the bimetal strip in a refrigerator?

- Ans ☒ 1. It increases the compressor speed for faster cooling
☒ 2. It produces cooling inside the freezer compartment
☒ 3. It prevents the refrigerator door from closing tightly
☒ 4. It helps to control the defrost cycle by sensing temperature changes

Q.163 When installing an auto transformer starter for a refrigeration compressor, which action best ensures both electrical safety and system performance?

- Ans
- ☐ 1. Testing the control circuit with a live supply before checking wiring with a multimeter
 - ☐ 2. Switching on the main supply before tightening the control wiring to save time
 - ☒ 3. Verifying all connections are tight and properly insulated before supply is switched on
 - ☐ 4. Using an oversized transformer to handle future load increases without rechecking wiring

Q.164 Which part of a bottle cooler evaporator is most responsible for removing heat from the bottles quickly?

- Ans
- ☐ 1. The insulation around the cabinet
 - ☒ 2. The finned surface of the evaporator coils
 - ☐ 3. The temperature control knob
 - ☐ 4. The compressor filter drier

Q.165 How does a pneumatic control system differ from an electronic control system in air-conditioning applications?

- Ans
- ☐ 1. Pneumatic systems only perform on-off control actions.
 - ☒ 2. Pneumatic systems use compressed air for control signals.
 - ☐ 3. Pneumatic systems use liquid refrigerant for control signals.
 - ☐ 4. Pneumatic systems rely on refrigerant flow.

Q.166 A refrigerant riser piping layout in orthographic projection shows a straight line from the compressor base upward. What does this line indicate about the pipe's orientation?

- Ans
- ☒ 1. The pipe is perpendicular to the compressor mounting plane
 - ☐ 2. The pipe is at the centre of the equipment layout
 - ☐ 3. The pipe is slanting relative to the mounting plane
 - ☐ 4. The pipe is parallel to the base datum reference

Q.167 A technician finds that the dry bulb temperature inside a workspace is higher than the outdoor dry bulb temperature. What could be a valid explanation for this observation under normal operating conditions?

- Ans
- ☐ 1. Reduced airflow in the ventilation system
 - ☐ 2. Windows are kept open for air circulation
 - ☒ 3. Heat-producing equipment is operating inside
 - ☐ 4. High humidity is present indoors

Q.168 Which sequence accurately describes the flow of refrigerant through the main components in a vapor compression cycle, starting from the evaporator?

- Ans
- ☐ 1. Evaporator, expansion valve, condenser, compressor
 - ☐ 2. Evaporator, condenser, compressor, expansion valve
 - ☒ 3. Evaporator, compressor, condenser, expansion valve
 - ☐ 4. Evaporator, condenser, expansion valve, compressor

Q.169 Which property is most important for a material used as thermal insulation in a refrigerator wall?

- Ans
- ☐ 1. High density
 - ☐ 2. High thermal conductivity
 - ☐ 3. High electrical conductivity
 - ☒ 4. Low thermal conductivity

Q.170 What is the main effect of adding moisture to the air in a conditioned room?

- Ans
- ☐ 1. The density of air decreases
 - ☐ 2. The temperature of the air decreases
 - ☐ 3. The air becomes free of contaminants
 - ☒ 4. The relative humidity of the air increases

Q.171 Which type of screwdriver is most suitable for a slotted screw head in electrical panels?

- Ans
- ☐ 1. Torx head screwdriver
 - ☐ 2. Phillips head screwdriver
 - ☐ 3. Pozidriv head screwdriver
 - ☒ 4. Flat head screwdriver

Q.172 An amplifier stage in an electronic control PCB shows phase reversal between input and output signals. Which amplifier configuration is most likely used?

- Ans
- ☒ 1. Common emitter configuration producing 180-degree phase reversal.
 - ☐ 2. Darlington pair configuration used only for impedance matching purpose.
 - ☐ 3. Common collector configuration with unity current gain operation.
 - ☐ 4. Common base configuration with zero voltage gain characteristics.

Q.173 What can happen if the temperature control knob in a frost free freezer is set to the coldest setting for a long period?

- Ans
- ☒ 1. Compressor will stop running
 - ☒ 2. Ice will form only on the door
 - ☒ 3. Gasket will become loose quickly
 - ☒ 4. Food items may develop freezer burn
-

Q.174 A factory manager needs a cooling tower design that minimizes water loss and is suitable for an area with limited water supply. Which type of cooling tower construction should be selected for optimal performance in these conditions?

- Ans
- ☒ 1. Closed circuit cooling tower
 - ☒ 2. Crossflow cooling tower
 - ☒ 3. Open circuit cooling tower
 - ☒ 4. Counterflow cooling tower
-

Q.175 Why is a high-capacity blower used in bus air-conditioning systems?

- Ans
- ☒ 1. To lubricate moving parts in the compressor
 - ☒ 2. To cool the refrigerant before expansion
 - ☒ 3. To heat the air before it enters the cabin
 - ☒ 4. To circulate air effectively within the bus
-



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	Refrigeration & AC Mechanic
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 (Refrigeration & AC Mechanic)

Q.101 While troubleshooting a split air-conditioner, a technician sees a symbol with two parallel lines, one straight and one curved, in the circuit diagram. What is the function of this component?

- Ans
- ☒ 1. Stores electrical energy for phase shifting
 - ☐ 2. Switches the circuit on or off automatically
 - ☐ 3. Senses temperature for compressor control
 - ☐ 4. Limits current flow in the circuit

Q.102 In the projection of a circular duct at an inclined angle on an engineering drawing, what is the apparent shape of the duct's cross-section in the projection view?

- Ans
- ☐ 1. Parabola
 - ☒ 2. Ellipse
 - ☐ 3. Circle
 - ☐ 4. Rectangle

Q.103 Which sensor is typically used in an electronic hygrometer for measuring relative humidity in air-conditioning systems?

- Ans
- ☐ 1. Thermocouple sensor
 - ☒ 2. Capacitive sensor
 - ☐ 3. Optical sensor
 - ☐ 4. Bimetallic sensor

Q.104 A central air-conditioning system in a commercial building is experiencing poor air distribution at the farthest outlets. Which axial fan modification is most likely to improve the situation without altering the ductwork?

- Ans
- ☒ 1. Increasing fan diameter while maintaining speed
 - ☐ 2. Adding duct insulation near the outlets
 - ☐ 3. Changing rectangular duct to circular shape
 - ☐ 4. Reducing fan motor voltage

Q.105 What is the most likely effect on the compressor when a refrigerator condenser becomes choked?

- Ans
- ☐ 1. Compressor uses less power and cycles off quickly
 - ☒ 2. Compressor runs longer and overheats
 - ☐ 3. Compressor operates silently and cools faster
 - ☐ 4. Compressor stops working completely

Q.106 Which scenario would most significantly increase the latent heat load in a large industrial warehouse?

- Ans
- ☐ 1. Using LED lights for reduced heat
 - ☐ 2. Positioning heat-producing equipment far from air intakes
 - ☐ 3. Installing additional insulation panels
 - ☒ 4. Frequent opening of exterior doors during humid weather

Q.107 Which of the following best describes a walk-in cooler?

- Ans ☒ 1. A heating chamber for baking
☒ 2. A ventilation duct system
☒ 3. A small portable freezer unit
☒ 4. A large refrigerated room for food storage

Q.108 Two wires made of the same material and having the same cross-sectional area are used in a control circuit. Wire A is 2 meters long, while Wire B is 4 meters long. Which wire will have greater resistance?

- Ans ☒ 1. Wire B has more resistance than Wire A
☒ 2. Resistance does not depend on length
☒ 3. Both have equal resistance
☒ 4. Wire A has more resistance than Wire B

Q.109 When evaluating the reliability of a continuity tester in assessing complex electronic assemblies, which factor most significantly affects the accuracy of its results?

- Ans ☒ 1. Physical condition and cleanliness of the probes used for testing
☒ 2. Presence of parallel paths that may provide alternative current routes
☒ 3. Ambient temperature of the electronic workshop environment
☒ 4. Battery charge level of the continuity tester during use that may affect voltage

Q.110 In a circuit with constant voltage, an increase in current causes electrical power to:

- Ans ☒ 1. Increase
☒ 2. Decrease
☒ 3. Remain unchanged
☒ 4. Become zero

Q.111 What happens in an air-conditioning system when the room temperature falls below the thermostat set temperature?

- Ans ☒ 1. The system switches to heating mode
☒ 2. The compressor runs continuously
☒ 3. The compressor is switched off
☒ 4. The compressor is switched on

Q.112 What is the nature of resulting flame when using excess acetylene in the gas welding process?

- Ans ☒ 1. Oxidizing flame
☒ 2. Neutral flame
☒ 3. Carburizing flame
☒ 4. Diffusion flame

Q.113 Which defrosting method in a domestic refrigerator uses a built-in timer to control the operation of the heating element?

- Ans ☒ 1. Hot gas defrosting method
☒ 2. Air circulation method
☒ 3. Manual defrosting method
☒ 4. Electric defrosting method

Q.114 A food processing company requires a cold storage plant that can hold 200 metric tons of produce at -18 degrees Celsius. What specification should be prioritized to ensure consistent temperature throughout the entire storage period?

- Ans ☒ 1. Higher ceiling heights for better air circulation
☒ 2. Smaller door dimensions for reduced air exchange
☒ 3. Adequate evaporator surface area for uniform cooling
☒ 4. Increased lighting intensity inside the storage room

Q.115 What is the main function of the evaporator in a refrigerator system?

- Ans ☒ 1. It condenses refrigerant to release heat
☒ 2. It compresses refrigerant to increase pressure
☒ 3. It absorbs heat from the compartment to cool it
☒ 4. It removes moisture from the refrigerant flow

Q.116 Which material would be most suitable for making a light but strong machine part, based on density values?

- Ans ☒ 1. Copper
☒ 2. Lead
☒ 3. Aluminum alloy
☒ 4. Cast iron

Q.117 Which of the following is the purpose of using flux during soldering?

- Ans ☒ 1. To increase the melting point of solder
☒ 2. To change the size of the metal joint
☒ 3. To prevent oxidation from metal surfaces
☒ 4. To add strength to the joint

Q.118 What is the main advantage of using a slip ring induction motor in refrigeration compressors?

- Ans
- ✓ 1. High starting torque
 - ✗ 2. Reduced noise level
 - ✗ 3. Smaller physical size
 - ✗ 4. Less maintenance required

Q.119 In a central air-conditioning system, which method is most effective for balancing air delivery to different zones within a building?

- Ans
- ✗ 1. Adding multiple thermostats
 - ✗ 2. Increasing compressor speed
 - ✓ 3. Using variable air volume boxes
 - ✗ 4. Installing larger ductwork

Q.120 In a mobile AC system, a technician observes poor cooling performance along with high suction pressure. Which expansion valve fault best explains this condition?

- Ans
- ✗ 1. Valve stuck closed blocking refrigerant entry
 - ✓ 2. Valve stuck open allowing excess refrigerant flow
 - ✗ 3. Sensing bulb not properly attached
 - ✗ 4. Clogged valve restricting refrigerant passage

Q.121 Which design modification would most improve the performance of a shell-and-tube condenser in a large commercial air conditioning plant?

- Ans
- ✗ 1. Using thinner refrigerant piping for increased flow
 - ✗ 2. Reducing the diameter of refrigerant tubes
 - ✗ 3. Raising water velocity through the tubes only
 - ✓ 4. Increasing the surface area of heat exchange tubes

Q.122 What is the main advantage of using a variable speed compressor in commercial refrigeration compared to a fixed speed compressor?

- Ans
- ✗ 1. It eliminates need for regular maintenance checks
 - ✓ 2. It adapts capacity to load, improving energy efficiency
 - ✗ 3. It always maintains constant pressure regardless of demand
 - ✗ 4. It operates silently under all load conditions

Q.123 Why is the evaporator coil typically placed inside the storage compartment of a deep freezer?

- Ans
- ✗ 1. To keep the compressor cool
 - ✓ 2. To absorb heat from stored items efficiently
 - ✗ 3. To provide structural support to the cabinet
 - ✗ 4. To reduce electrical consumption

Q.124 If the temperature is 0 degrees Celsius, what is the equivalent temperature on the Kelvin scale?

- Ans
- ✓ 1. 273 Kelvin
 - ✗ 2. 0 Kelvin
 - ✗ 3. 100 Kelvin
 - ✗ 4. 298 Kelvin

Q.125 Which component does the automatic expansion valve directly control by its operation?

- Ans
- ✗ 1. The oil level in the compressor
 - ✗ 2. The temperature of the condenser fan
 - ✗ 3. The speed of the compressor motor
 - ✓ 4. The flow of refrigerant into the evaporator

Q.126 Which of the following best describes the placement of dimension figures and lines in the unidirectional system when dimensioning a complex RAC component drawing?

- Ans
- ✓ 1. Dimension figures are always placed horizontally above the dimension line
 - ✗ 2. Dimension figures are positioned along the arrowhead at the end of the dimension line
 - ✗ 3. Dimension figures are placed inside the extension lines wherever possible
 - ✗ 4. Dimension figures are placed in line with the feature being dimensioned

Q.127 Which component in a screw compressor is directly responsible for the compression of the refrigerant?

- Ans
- ✓ 1. The intermeshing male and female rotors
 - ✗ 2. The centrifugal impeller
 - ✗ 3. The reciprocating piston assembly
 - ✗ 4. The stationary vanes

Q.128 A cold storage plant is designed for deep freezing food products. The manager notices that the freezing rate is slower than expected and suspects inadequate evaporator performance. Which action is most likely to resolve this issue?

- Ans ☒ 1. Reducing the airflow across the evaporator coil
☒ 2. **Cleaning the evaporator surfaces to improve heat transfer**
☒ 3. Raising the room temperature by a few degrees
☒ 4. Increasing the refrigerant charge in the system

Q.129 Which main goal is achieved by the Montreal Protocol related to refrigerants in India?

- Ans ☒ 1. Increasing the use of traditional refrigerants in old systems
☒ 2. Raising the energy consumption for industrial refrigeration
☒ 3. Encouraging use of natural gases in all household equipment
☒ 4. **Protecting the ozone layer by reducing harmful refrigerants**

Q.130 What is the main function of the adjusting screw on a compass in engineering drawing?

- Ans ☒ 1. To mark the circle boundary
☒ 2. To locate the centre point
☒ 3. **To set and maintain the radius distance**
☒ 4. To draw the arc neatly

Q.131 Which material is commonly used for making disposable air filters in air-conditioning systems?

- Ans ☒ 1. Steel wire mesh
☒ 2. Activated carbon
☒ 3. Aluminum mesh
☒ 4. **Fiberglass mesh**

Q.132 Which method is NOT suitable for artificial humidification in standard air-conditioning practice?

- Ans ☒ 1. Using a spray type humidifier
☒ 2. **Using open container of water in corner**
☒ 3. Using a wetted pack humidifier
☒ 4. Injecting steam into the airflow

Q.133 A shaft requires a tough core with a hard surface. Which heat treatment process should be applied?

- Ans ☒ 1. Annealing
☒ 2. **Case hardening**
☒ 3. Normalizing
☒ 4. Nitriding

Q.134 Which of the following is a key difference between a Variable Refrigerant Volume system and a traditional split AC system?

- Ans ☒ 1. VRV systems require one outdoor unit per indoor unit
☒ 2. VRV systems use water piping instead of refrigerant piping
☒ 3. **A VRV system connects multiple indoor units to one outdoor unit**
☒ 4. VRV systems circulate chilled water through AHUs instead of refrigerant piping

Q.135 Which part of a file fits into the handle to secure the file?

- Ans ☒ 1. Blade
☒ 2. Tip
☒ 3. Heel
☒ 4. **Tang**

Q.136 Which safety symbol would indicate a risk of high voltage in an industrial workshop?

- Ans ☒ 1. A gear inside a square
☒ 2. A flame inside a circle
☒ 3. **A lightning bolt inside a triangle**
☒ 4. A skull and crossbones symbol

Q.137 Which of the following factors results in welding distortion in a gas-welded thin metal sheet?

- Ans ☒ 1. Moderate heat and continuous filler addition
☒ 2. Uniform heat input and steady hand movement
☒ 3. Low heat input and frequent tack welding
☒ 4. **High heat input and lack of proper tack welding**

Q.138 How does providing first aid contribute to the safety objectives in a mechanical workshop environment?

- Ans ☒ 1. It guarantees that no injuries will occur in the future
☒ 2. **It helps reduce the severity of injuries until professionals take over**
☒ 3. It replaces the need for professional medical treatment entirely
☒ 4. It removes all potential hazards from the workplace

Q.139 A refrigerator's compressor is not starting, and voltage is present at the compressor terminals. What is the next logical troubleshooting step regarding the wiring?

- Ans ☒ 1. Replace the wiring harness without testing
☒ 2. Check for continuity in the start relay wiring circuit
☐ 3. Change the overload protector immediately
☐ 4. Inspect the thermostat for physical damage

Q.140 An ice-cream manufacturer must maintain a constant low temperature and prevent product dehydration during storage. Which cold storage type best meets these criteria?

- Ans ☐ 1. General warehouse storage
☐ 2. Chilled storage without humidity control
☒ 3. Frozen storage with humidity control
☐ 4. Ventilated storage at ambient temperature

Q.141 If air at 25°C dry bulb temperature and 50% relative humidity is heated at constant moisture content, what happens to its relative humidity?

- Ans ☒ 1. It decreases
☐ 2. It reaches saturation
☐ 3. It remains unchanged
☐ 4. It increases

Q.142 In a Zener diode voltage regulator circuit, what is the expected behavior of the output voltage across the load if the input voltage rises above the Zener breakdown voltage?

- Ans ☐ 1. It becomes zero
☐ 2. It increases continuously
☐ 3. It becomes negative
☒ 4. It remains nearly constant

Q.143 Which of the following best describes the function of a Megger in electrical work?

- Ans ☒ 1. It is used to measure insulation resistance between conductors
☐ 2. It is used to measure the total length of electrical cables
☐ 3. It is used to determine the thickness of electrical wires
☐ 4. It is used to check the amount of power drawn-out in a circuit

Q.144 A worker argues that head protection is unnecessary in their specific zone because there are no active overhead tasks. As a safety officer, what is the most valid justification for enforcing mandatory head protection?

- Ans ☒ 1. Unseen accidental impacts can still occur, so head protection is essential
☐ 2. Allow workers to decide based on their own risk assessment
☐ 3. Require head protection only where visible risks exist
☐ 4. Rely on the past safety records to decide whether head protection should be used or not

Q.145 Which electronic component is commonly used for simple voltage regulation circuits?

- Ans ☐ 1. Transformer for amplifying weak electronic control circuit signals.
☐ 2. SCR for converting AC supply into controlled DC output voltage.
☒ 3. Zener diode for maintaining nearly constant output voltage level.
☐ 4. Capacitor for generating high-frequency oscillations in control circuits.

Q.146 In a direct cool refrigerator, which physical principle primarily drives the movement of cold air from the freezer section to the fresh food section?

- Ans ☐ 1. Pressure difference created by the compressor suction line
☐ 2. Capillary action through the insulation foam
☒ 3. Density difference caused by temperature gradient
☐ 4. Forced convection generated by an evaporator fan

Q.147 What is the primary function of a desoldering braid (Wicking braid) in PCB repair work?

- Ans ☐ 1. It melts solder joints using electric heating for fast removal process.
☐ 2. It applies flux on joints to improve solder flow during joining process.
☒ 3. It absorbs molten solder from PCB pads using capillary action effect.
☐ 4. It mechanically scrapes solder from components using abrasive action.

Q.148 Which statement is correct about a Direct Expansion (DX) central air-conditioning system?

- Ans ☐ 1. A DX system circulates air without cooling
☒ 2. A DX system uses refrigerant for direct cooling, not chilled water
☐ 3. A DX system always operates with higher humidity
☐ 4. A DX system uses water for cooling, not refrigerant

- Q.149** While servicing a refrigerator evaporator, an accumulator is found to have excessive oil inside. What is the most appropriate troubleshooting step to address this issue?
- Ans ☒ 1. Increase the refrigerant charge to flush excess oil from the system
☒ 2. Adjust the expansion valve to reduce oil carryover into the accumulator
☒ 3. Clean or replace the accumulator to restore proper oil separation
☒ 4. Bypass the accumulator to prevent oil accumulation in the unit
-
- Q.150** A technician observes liquid refrigerant carryover into the compressor. Which adjustment should be prioritized to prevent this condition?
- Ans ☒ 1. Decrease the amount of sub cooling at the condenser outlet
☒ 2. Increase the amount of sub cooling at the evaporator outlet
☒ 3. Decrease the amount of super heating at the evaporator outlet
☒ 4. Increase the amount of super heating at the evaporator outlet
-
- Q.151** Which combination of properties makes hermetically sealed compressors especially suitable for domestic refrigerators?
- Ans ☒ 1. Easier access for maintenance and rapid cooling performance
☒ 2. Flexible mounting options with easier component change and less motor noise
☒ 3. Prevention of refrigerant leakage and protection from contaminants
☒ 4. Lower energy consumption and reduced vibration
-
- Q.152** During troubleshooting, what is the most important step to verify if an Overload Protector (OLP) in a refrigerator compressor circuit is functioning correctly?
- Ans ☒ 1. Check for voltage at compressor terminals using a multimeter
☒ 2. Check for continuity across overload protector terminals using a multimeter
☒ 3. Check the capacitor value with an analog meter
☒ 4. Check the compressor windings with a clamp meter
-
- Q.153** Which color label identifies a water extinguisher in fire safety equipment?
- Ans ☒ 1. Black label with a grey band
☒ 2. Blue label with a white band
☒ 3. Yellow label with a green band
☒ 4. Red label without any colored band
-
- Q.154** In a spanner used to loosen a tight nut, the effort is applied at the handle end, the fulcrum is at the bolt, and the load is at the nut. If the handle length is increased while the load remains constant, what is the effect on mechanical advantage?
- Ans ☒ 1. Mechanical advantage decreases
☒ 2. Mechanical advantage remains the same
☒ 3. Mechanical advantage becomes zero
☒ 4. Mechanical advantage increases
-
- Q.155** How does latent heat load differ from sensible heat load in air conditioning design?
- Ans ☒ 1. Latent load is about building size; sensible load is about occupancy
☒ 2. Latent load involves moisture removal; sensible load involves temperature control
☒ 3. Latent load requires larger compressors; sensible load needs smaller fans
☒ 4. Latent load increases energy efficiency; sensible load reduces efficiency
-
- Q.156** Which type of cooling tower uses a fan to force air through the water to enhance cooling efficiency?
- Ans ☒ 1. Crossflow cooling tower
☒ 2. Closed circuit cooling tower
☒ 3. Natural draft cooling tower
☒ 4. Mechanical draft cooling tower
-
- Q.157** Which component in a train air conditioning system primarily removes heat from the passenger compartment?
- Ans ☒ 1. Evaporator coil
☒ 2. Expansion valve
☒ 3. Compressor
☒ 4. Condenser coil
-
- Q.158** Which scenario would result in the lowest relative humidity in an air conditioned room?
- Ans ☒ 1. Low temperature with low moisture content
☒ 2. Low temperature with high moisture content
☒ 3. High temperature with high moisture content
☒ 4. High temperature with low moisture content
-

Q.159 Which situation most justifies selecting a mini screwdriver over a standard-size one when assembling an electronic circuit board with dense components?

- Ans
- ☒ 1. When large components require robust tightening force and space is available
 - ☒ 2. When the working area has no space restrictions and small tightening force is required
 - ☒ 3. When access is limited due to closely packed parts and small fasteners are used
 - ☒ 4. When fasteners are of the standard size and ample space is available

Q.160 If the diameter of a circular plate is doubled, how does the area change?

- Ans
- ☒ 1. Area remains the same
 - ☒ 2. Area becomes eight times larger
 - ☒ 3. Area becomes sixteen times larger
 - ☒ 4. Area becomes four times larger

Q.161 Which instrument is commonly used for insulation resistance testing?

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

Q.162 What distinguishes a maintenance log from an equipment inventory list in refrigeration maintenance?

- Ans
- ☒ 1. A maintenance log details service history, while inventory lists track assets
 - ☒ 2. A maintenance log records warranty periods, while inventory lists show purchase costs
 - ☒ 3. A maintenance log lists spare parts, while inventory lists record repairs
 - ☒ 4. A maintenance log tracks technician attendance, while inventory lists show tools used

Q.163 Which cutting tool is most suitable for producing a straight, burr-free edge on a galvanized sheet while minimizing material waste?

- Ans
- ☒ 1. Using a well-aligned guillotine shear with sharp blades
 - ☒ 2. Using a coarse grain abrasive cutting wheel at high speed
 - ☒ 3. Employing hand snips with rapid cutting motion
 - ☒ 4. Applying a cold chisel along a marked line

Q.164 Why is the vapour compression cycle preferred over the absorption refrigeration cycle in commercial refrigerators?

- Ans
- ☒ 1. It requires no refrigerant and is completely maintenance-free
 - ☒ 2. It operates silently and requires no moving mechanical parts
 - ☒ 3. It can use waste heat from industrial processes as its energy source
 - ☒ 4. It provides higher efficiency for continuous operation

Q.165 Which of the following defines the coefficient of performance of a vapor compression refrigeration system?

- Ans
- ☒ 1. Ratio of pressure drop in evaporator to temperature drop in evaporator
 - ☒ 2. Ratio of Input work in compressor to heat absorbed in evaporator
 - ☒ 3. Ratio of refrigerant mass flow rate in evaporator to input work in compressor
 - ☒ 4. Ratio of heat absorbed in evaporator to input work in compressor

Q.166 Which electrical property enables a conductor to allow current flow easily?

- Ans
- ☒ 1. High insulation
 - ☒ 2. High resistivity
 - ☒ 3. High conductivity
 - ☒ 4. High reactance

Q.167 A mechanic uses a chain pulley block with a velocity ratio of 6 to lift a 360 kg load. The effort applied is 80 kg. What is the mechanical efficiency of the machine, (Take $g = 9.8 \text{ m/s}^2$)?

- Ans
- ☒ 1. Mechanical efficiency is 83%
 - ☒ 2. Mechanical efficiency is 75%
 - ☒ 3. Mechanical efficiency is 54%
 - ☒ 4. Mechanical efficiency is 68%

Q.168 According to industry standards, which best practice must be followed to maintain condenser efficiency and ensure technician safety during maintenance?

- Ans
- ☒ 1. Operate the system at maximum pressure during cleaning
 - ☒ 2. Disconnect power supply before cleaning or servicing the condenser
 - ☒ 3. Remove refrigerant before inspecting the condenser coil
 - ☒ 4. Use water directly on electrical connections to clean

Q.169 What is the main function of an electronic control system in an air-conditioning unit?

- Ans
- ☒ 1. To regulate system operation by processing sensor data
 - ☒ 2. To manually switch the system on and off
 - ☒ 3. To control only the refrigerant flow
 - ☒ 4. To generate power for the compressor

Q.170 What is the function of a swash plate in a swash plate compressor?

- Ans
- ☒ 1. It acts as a refrigerant filter to trap contaminants
 - ☒ 2. It converts rotary motion into reciprocating motion
 - ☒ 3. It is used to rotate the cooling fan in the evaporator
 - ☒ 4. It compresses the refrigerant directly to vapor

Q.171 What is the main purpose of leak testing in a cold storage plant refrigeration system?

- Ans
- ☒ 1. To clean the condenser coils
 - ☒ 2. To measure the storage room temperature
 - ☒ 3. To detect any refrigerant escaping from the system
 - ☒ 4. To check the pressure levels in the compressor

Q.172 What is the function of a drier in a domestic refrigerator system?

- Ans
- ☒ 1. To cool the refrigerant before compression
 - ☒ 2. To remove moisture from the refrigerant
 - ☒ 3. To reduce refrigerant pressure in the system
 - ☒ 4. To regulate refrigerant flow in the system

Q.173 In an engineering drawing for a compressor housing, how should a concealed internal oil passage be represented in the orthographic side view?

- Ans
- ☒ 1. By using thin continuous lines extending beyond the passage
 - ☒ 2. By using alternating long and short dashes to mark the passage
 - ☒ 3. By using continuous thick lines along the visible outline
 - ☒ 4. By using uniformly spaced short dashed lines indicating the concealed outline

Q.174 When two sheets of metal are joined using a rivet, what is the main reason for forming a 'shop head' on the opposite side of the factory head?

- Ans
- ☒ 1. It increases the rivet's total length for adjustment
 - ☒ 2. It locks the rivet in place to secure both sheets
 - ☒ 3. It serves as a decorative feature on metal surfaces
 - ☒ 4. It reduces vibration without locking the joint

Q.175 Why are chillers often used in commercial buildings instead of split air conditioners?

- Ans
- ☒ 1. Chillers can cool water for centralized air-conditioning systems
 - ☒ 2. Chillers are easier to install in small rooms
 - ☒ 3. Chillers supply heated air during winter
 - ☒ 4. Chillers require less maintenance than split ACs