RRB ALP CBT-II (Refrigeration & Air Conditioning Mechanic) Official Paper (Held On: 02 May, 2025 Shift 1) (Previous Year Paper)

RRB Assistant Loco Pilot (ALP) • 2025 • 175 questions • 150 minutes • Answer key

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1 question is in Hindi and not printed here. Each one links to the online version, where you can read it.

PART A

Q1. The resistivity of a conductor depends on which of the following factors?

(a) Area of the conductor
(b) Mass of the conductor
(c) Nature of the conductor
(d) Diameter of conductor

Q2. Which of the following statements is correct regarding negative work done?

(a) The work done cannot be negative.
(b) When the force is perpendicular to the displacement, the work done is negative.
(c) When the force acts opposite to the direction of displacement, the work done is negative.
(d) When the force and displacement are in the same direction, the work done is negative.

Q3. In areas with hot climate, white colour of the exterior walls of the house is preferred because

(a) White color keeps the interior environment of the house cool by reflecting sunlight.
(b) White color makes the wall more durable.
(c) White color makes the house brighter by absorbing more sunlight.
(d) The white color looks good.

Q4. The sum of Yash's and his father's ages is 90 years. When Yash's age equals his father's present age, he will be five times his son Suraj's present age. When Yash's age equals his father's present age, Suraj's age will be 12 years more than Yash's present age. Find Suraj's present age.

(a) 15 years
(b) 18 years
(c) 12 years
(d) 16 years

Q5. What should come in place of question mark (?) in the given alphanumeric series?

G5, I10, L15, N20, Q25, S30, ?

(a) W35
(b) V35
(c) V40
(d) U35

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Q6. Which of the following is a supplementary protocol that allows non-ASCII data to be sent via e-mail?

(a) HTTPS
(b) Multipurpose Internet Mail Extensions (MIME)
(c) DNS
(d) Mailing Lists

Q7. Which of the following options best describes the primary function of digital signatures in electronic communications?

(a) It automatically stores all electronic documents for future reference.
(b) It encrypts the entire message content to ensure confidentiality.
(c) It verifies the identity of the sender and ensures the integrity of the message.
(d) This allows the recipient to edit the document before adding the signature.

Q8. The areas of three adjacent faces of a solid cuboid are 216 cm^2, 114 cm^2 and 19 cm^2. Find the volume (in cm^3) of the cuboid.

(a) 684
(b) 955
(c) 532
(d) 880

Q9. Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it seems to be at variance from commonly known facts, decide which of the given conclusions logically follows from the statements.

Statements:

Some bananas are litchis.

All litchis are kiwis.

Some kiwis are strawberries.

Conclusions:

1. All bananas are kiwis is a possibility.
2. All kiwis are litchis.

(a) Only conclusion 1 follows
(b) Only conclusion 2 follows
(c) Neither conclusion 1 nor 2 follows
(d) Both conclusions 1 and 2 follow

Q10. Which of the following ecosystems has very low temperatures and frozen soil?

(a) Desert
(b) Tropical rainforest
(c) Pasture
(d) Tundra

Q11. If A is an acute angle and p tan A = n sec A, then find the value of $(p^2 - n^2)/pn$.

(a) cot A .cos A
(b) sin A .cos A
(c) (tan A)/(sec A)
(d) None of the above.

Q12. A fruit vendor initially had a few apples. He sold 40% of them and still had 300 apples left. How many apples did he initially have?

(a) 750
(b) 450
(c) 600
(d) 500

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Q13. Megha bought a bag for Rs. 1,271 after getting an 18% discount on the marked price. Find the marked price of the bag.

(a) 1,450
(b) 1,650
(c) 1,550
(d) 1,350

Q14. Which of the following methods is the safest method for disposal of toxic dust?

(a) Leaving it in the air for dilution.
(b) Sweeping it in open areas.
(c) Using special hazardous waste disposal containers.
(d) Putting it in regular trash cans.

Q15. Vijay cycles 10 meters from home to tuition, then 5 meters to the shop. He returns home in the same way, covering the same distance. Find the total length of the path.

(a) 20 m
(b) 15 m
(c) Zero
(d) 30 m

Q16. A, B, C, D, E, and F live on six different floors of the same building. The ground floor is numbered 1, the floor immediately above it is numbered 2, and so on, until the topmost floor is numbered 6. D lives on an odd-numbered floor, but not 3. The sum of the floors on which D and E live is 7. A lives on the floor immediately below C. F lives on the topmost floor. How many people live between E and F?

(a) 4
(b) 1
(c) 3
(d) 2

Q17. Which of the following noise levels is considered potentially harmful to human health when experienced over a long period of time?

(a) 70 dB
(b) 90 dB
(c) 30 dB
(d) 50 dB

Q18. 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 letter-cluster pair is not based on the number of consonants/vowels or their position.)

(a) GN-PV
(b) JQ-SY
(c) HO-QW
(d) AH-JR

Q19. Which of the following relations is not correct?

(a) Electric power = $(\text{current})^2 \times \text{resistance}$
(b) Electric power = voltage × current
(c) Electric power = voltage/current
(d) Electric power = $(\text{voltage})^2$ / resistance

Q20. In the following triplet, each group of letters is related to the next group following a certain logic. Select the option from the given ones that follows the same logic.

TERM-ERTM-TMRE

(a) WHEN-HWEN-WENH
(b) ZERO-EZRO-ZREO

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(c) VICE-ICVE-VECI
(d) USER-RESU-REUS

Q21. Which of the following options does not correctly represent the electric power P in a circuit (current, potential difference and resistance are symbolically written as I, V and R respectively.)
(a) $P = (V^2)/R$
(b) $P = I^2 R$
(c) $P = VI$
(d) $P = IR^2$

Q22. In a certain code language, 'BARE' is coded as '8264' and 'RIDS' is coded as '3587'. What is the code for 'R' in the given code language?
(a) 3
(b) 8
(c) 6
(d) 5

Q23. Kinetic energy and potential energy together are called which form of energy?
(a) Mechanical
(b) Chemical
(c) Ionic
(d) Nuclear

Q24. If a circuit contains resistors of 10 Ω, 20 Ω and 60 Ω are connected in parallel, then find the total resistance of the circuit.
(a) 90 Ω.
(b) 60 Ω
(c) 6 Ω
(d) 20 Ω

Q25. What term is used to describe organisms in an ecosystem that produce their own food?
(a) Consumer
(b) Decomposer
(c) Vegetarian
(d) Producer

Q26. What should come in place of question mark (?) in the given series?
185 174 163 152 ? 130
(a) 144
(b) 142
(c) 143
(d) 141

Q27. What is the primary source of energy for most ecosystems?
(a) Soil
(b) Wind
(c) Sunlight
(d) Water

Q28. Potential energy falls under which of the following categories of energy?
(a) Thermal energy
(b) Light energy
(c) Chemical energy
(d) Mechanical energy

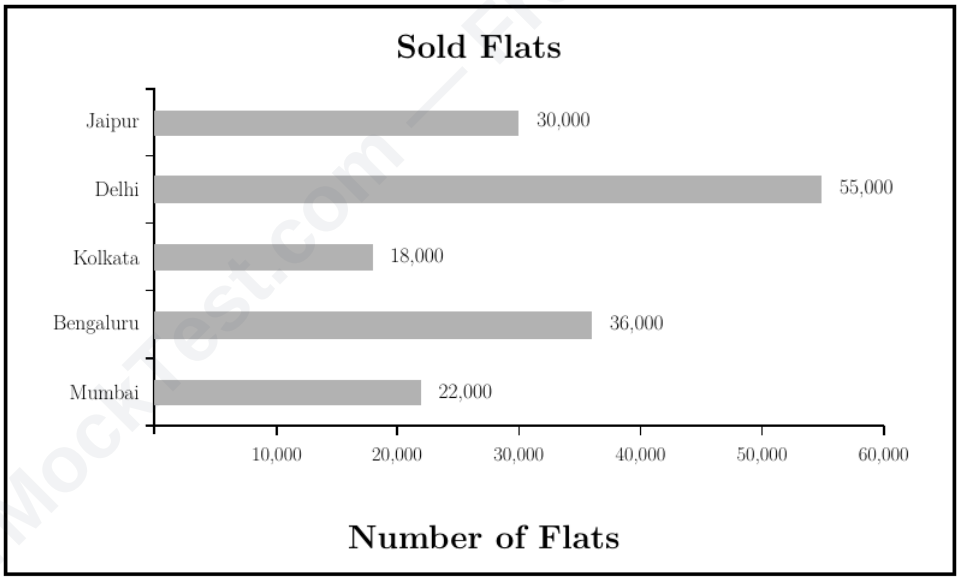
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Q29. Two resistors of resistance 20 Ω and 30 Ω are connected in series in a circuit. If the supplied voltage is 250 V, find the current transmitted through the circuit.

(a) 8 A
(b) 12 A
(c) 5 A
(d) 20 A

Q30. Study the given bar graph and answer the question below.

The given bar graph shows the number of flats sold by a builder in five different cities in the year 2020.



The number of flats sold in Delhi is what percent more than the number of flats sold in Mumbai?

(a) 75%
(b) 125%
(c) 120%
(d) 150%

Q31. Which of the following instruments is used to measure temperature?

(a) Hygrometer
(b) Voltmeter
(c) Thermometer
(d) Odometer

Q32. Use of energy efficient machinery in industrial settings mainly helps in _____.

(a) increase energy consumption and consequently the cost of the product
(b) reducing industrial energy requirements and improve the competitiveness of products
(c) reducing operational efficiency
(d) extending the life of old equipment

Q33. A dozen pairs of jeans costing Rs. 3,520 are available at a discount of 35%. How many pairs of jeans can be purchased for Rs. 572?

(a) 2
(b) 5
(c) 1
(d) 3

Q34. Refer to the following letter and symbol series and answer the question that follows. Counting is to be done from left to right only.

(Left) L R Ω Y A $ K ^ T J # Q & # E % S U * £ B (Right)

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

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by a letter?

(a) Two
(b) One
(c) Four
(d) Three

Q35. In the SI system, which of the following options best describes the fundamental quantities?

(a) Distance, Speed, Acceleration
(b) Temperature, pressure, volume
(c) Force, power, energy
(d) Length, mass, time

Q36. An ammeter has 20 divisions between 0 and 2 A. The least count of an ammeter is _____.

(a) 0.2 A
(b) 0.1 A
(c) 1 A
(d) 2 A

Q37. If 'A' denotes '÷', 'B' denotes 'x', 'C' denotes '+' and 'D' denotes '-', then what will come in place of question mark (?) in the following equation?

38 C 32 A 4 D 5 B 7=?

(a) 10
(b) 8
(c) 11
(d) 9

Q38. If $x^3 + y^3 = 16$ and $x + y = 4$, then find the value of xy.

(a) 4
(b) 2
(c) 3
(d) 0

Q39. What is the average human body temperature?

(a) 40°C
(b) 32°C
(c) 42°C
(d) 37°C

Q40. Which of the following statements is true?

(a) In the kitchen, aluminium utensils are used because aluminium is a good conductor of heat.
(b) Both insulators and conductors allow heat to pass through them easily.
(c) Plastic is a good conductor of heat.
(d) Wood is a good conductor of heat.

Q41. Refer to the following letter and symbol series and answer the question that follows. Counting is to be done from left to right only.

(Left) ^ T J # * £ B L R Ω Y # E % S U $ K Q & (Right)

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

(a) One
(b) Two
(c) Three
(d) Four

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Q42. According to the SI system of units, how many fundamental units are used to measure physical quantities?

(a) 5
(b) 10
(c) 7
(d) 4

Q43. Eight people are sitting in two parallel rows containing 4 people in each row, in such a way that there is an equal distance between adjacent persons. Row 1 contains A, B, C and D, all of whom are facing south. Row 2 contains P, Q, R and S, all of whom are facing north. Thus, each person faces another person in the other row. Only two people sit between P and Q. A faces the person sitting to the immediate left of P. R sits to the immediate left of S. D sits to the immediate right of C. Who among the following faces P?

(a) D
(b) C
(c) B
(d) A

Q44. Which of the following sequences of components primarily serves to execute instructions, store permanent firmware, temporarily store data during program execution, and provide a platform for interconnecting hardware components on a computer motherboard?

(a) RAM-ROM - CPU - PCB
(b) PCB-ROM-CPU-RAM
(c) CPU-RAM-ROM-PCB
(d) CPU-ROM-RAM- PCB

Q45. The area of a regular polygon with side 12 cm is 144 cm^2. If the perpendicular distance from the center to the side of the polygon is 6 cm, find the number of sides of the polygon.

(a) 5
(b) 7
(c) 6
(d) 4

Q46. A man purchased two varieties of pens at the rates of Rs. 8 for 9 pens and Rs. 8 per pen. If he purchased an equal number of pens of each of the two varieties and then sold all his pens at Rs. 6 per pen, what was his profit percentage?

(a) 33%
(b) 32%
(c) 45%
(d) 35%

Q47. Match the columns:

Engineering Applications	Types of Engineering Drawings
A) Plans, facade elevations, and foundation drawings of houses to be constructed.	P) Mechanical Engineering Drawings
B) Circuit Diagrams and Electrical Installation Drawings.	Q) Electronics Engineering Drawings
C) PCB Track Drawings.	R) Electrical Engineering Drawings
D) Riveted Joints and Welded Joints.	S) Civil Engineering Drawings

(a) A-P: B-R; C-Q; D-S
(b) A-S; B-P; C-Q; D-R
(c) A-S; B-R; C-Q; D-P
(d) A-S; B-R; C-P; D-Q

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Q48. 6 men or 5 women can complete a task in 7 days. 6 men work for 5 days and then leave. Find the number of women needed to complete the remaining task in 5 days.

(a) 4
(b) 2
(c) 1
(d) 3

Q49. Which of the following statements are correct regarding the use of a fire extinguisher?

Statement 1: It is safe to attempt to extinguish any type of fire, regardless of the presence of toxic fumes.

Statement 2: The P.A.S.S. technique, which stands for Pull, Aim, Squeeze, and Sweep, is recommended for effective use of a fire extinguisher.

(a) Neither statement 1 nor 2 is correct.
(b) Only statement 1 is correct.
(c) Both statements 1 and 2 are correct.
(d) Only statement 2 is correct.

Q50. Which of the following three-dimensional geometric figures has eight vertices and six rectangular faces?

(a) Pyramid
(b) Cylinder
(c) Parallelogram
(d) Cuboid

Q51. In a hospital, the ratio between the number of doctors and the number of nurses was 1 : 3. The addition of 12 new doctors and the departure of 24 nurses brings the ratio to 3 : 4. After k more nurses resign from the hospital, the ratio becomes 1 : 1. Find the value of k.

(a) 12
(b) 28
(c) 24
(d) 26

Q52. Which of the following statements is/are correct regarding functional dimension (F) in engineering drawings?

Statement 1: Functional dimensions are essential for the function of the component or space.

Statement 2: Functional dimensions are usually shown without any boundaries.

Statement 3: Functional dimensions are shown for reference purposes only.

(a) Only statement 1 is true
(b) Only statement 3 is true
(c) Only statements 2 and 3 are true
(d) Only statements 1 and 2 are true

Q53. 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 from commonly known facts, decide which of the given conclusions logically follows from the given statements.

Statements:

1. Some desks are tables.

II. All tables are cabinets.

III. All cabinets are beds.

Conclusions:

I. Some beds are tables.

II. All cabinets are desks.

(a) Only conclusion I follows.
(b) Only conclusion II follows.
(c) Both conclusions I and II follow.
(d) Neither conclusion I nor conclusion II follows.

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Q54. Ganpat starts from point A and walks 18 m west. He turns left, walks 32 m, then turns left again, walks 26 m, then turns left again, walks 61 m, and stops at point B. Meena starts from point Z, which is 22 m east of point A. She walks 42 m north, turns right, walks 35 m, turns right and walks 13 m, and stops at point Y. Find the shortest distance between point B and point Y. (All turns are 90-degree turns only.)

(a) 52 m
(b) 43 m
(c) 57 m
(d) 49 m

Q55. Three circular plates of radii 3 m, 2 m, and 1 m are cut from a rectangular cardboard sheet 46 m long and 8 m wide. If the area of the remaining cardboard sheet is equal to the area of a square, find the length of each side of the square. (Use π = 22/7)

(a) 20 m
(b) 18 m
(c) 14 m
(d) 16 m

Q56. In a certain code language, 'CARD' is coded as '8674' and 'MICE' is coded as '3517'. What is the code for 'C' in the given code language?

(a) 8
(b) 7
(c) 1
(d) 6

Q57. When an object of mass 50 kg is moved from one point to another along a horizontal line, what is the work done by the force of gravity on the object? (g = 10 m / s^2)

(a) Zero
(b) 50 J
(c) 500 J
(d) -500 J

Q58. If 50 : x :: x : 32 and x > 0, then find the value of x.

(a) 45.8
(b) 40
(c) 38.7
(d) 40.6

Q59. Two plumbers, X and Y, are paid a total of Rs. 770 per day by their employer. If X is paid 140% of the amount paid to Y, how much is Y paid per day (in Rs. , rounded to two decimal places)?

(a) 320.83
(b) 220.83
(c) 270.83
(d) 370.83

Q60. What will be the value of 10 km/hr in SI units?

(a) 10 m/s
(b) 0.16 m/s
(c) 2.7 m/s
(d) 1000 m/s

Q61. 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'.

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If 'E & F + G - H x T', then how is E related to T?

(a) Wife's mother's father
(b) Wife's brother
(c) Wife's father
(d) Wife's mother's brother

Q62. If $x = (7 + \sqrt{5})$, $y = (7 - \sqrt{5})$, then find the value of $x^2 + y^2$.

(a) 96
(b) 137
(c) 124
(d) 108

Q63. Convert 1 kilowatt hour (kWh) to joule.

(a) 1 kWh = 3.6 × 10^6 J
(b) 1 kWh = 3.6 × 10^7 J
(c) 1 kWh = 3.6 × 10^5 J
(d) 1 kWh = 3.6 × 10^3 J

Q64. Which of the following letter-clusters should replace # and % so that the pattern and relationship followed between the letter-cluster pairs 4 to the left of :: is the same as the pattern and relationship followed between the letter-cluster pairs 4 to the right of ::?

: HDI :: MIN : %

(a) = JFI, % = KGL
(b) # = JFK, % = KGM
(c) # = JFK, % = KGL
(d) = JFK, % = KHL

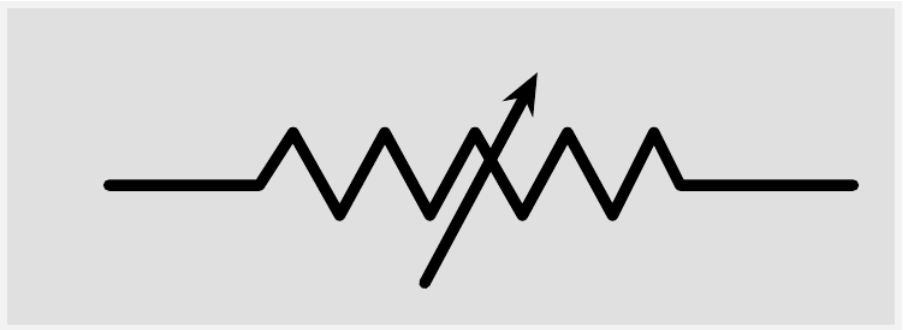
Q65. What is the designation of the trimmed sheet with dimensions 297 mm x 420 mm, as per the ISO-A size series?

(a) A1
(b) A2
(c) A4
(d) A3

Q66. Which of the following expressions is not correct for electric power?

(a) P = VI
(b) P= V^2/R
(c) P = I^2/R
(d) P = I^2R

Q67. What does the symbol given below in the circuit diagram represent?



(a) Voltmeter
(b) Voltage source
(c) Resistor

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(d) Variable resistor

Q68. Preeti, Kiran, Grace, Ankit, Deepak, Nitin and Neelam each have an exam on a different day of the same week, starting from Monday and ending on Sunday. Preeti has an exam on Thursday. Only one person has an exam between Preeti and Nitin. Grace has an exam the day immediately before Nitin but not on Monday. Only two people have an exam between Grace and Deepak. Neelam has her exam before Ankit but after Kiran. Who among the following has an exam on Monday?

(a) Nitin
(b) Neelam
(c) Kiran
(d) Deepak

Q69. If 5/9 of a number is 6 more than 1/2 of that number, then find that number.

(a) 104
(b) 108
(c) 106
(d) 102

Q70. What should be done immediately after a fuel spillage in a workshop?

(a) Cover it with plastic to prevent evaporation.
(b) Use water to wash it off
(c) Leave it as is and inform the supervisor later
(d) Empty the area and control overflow using absorbent materials

Q71. A cube of mass 5.74 g occupies a volume of 1.2 cm^3. The density (in g/cm^3) expressed with the correct number of significant figures is _____.

(a) 4.7833
(b) 4.8
(c) 4.78
(d) 4.783

Q72. In science, work done is defined as:

(a) force / distance
(b) force / displacement
(c) force × displacement
(d) force × distance

Q73. Simplify 976 × 265 + 976 × 735.

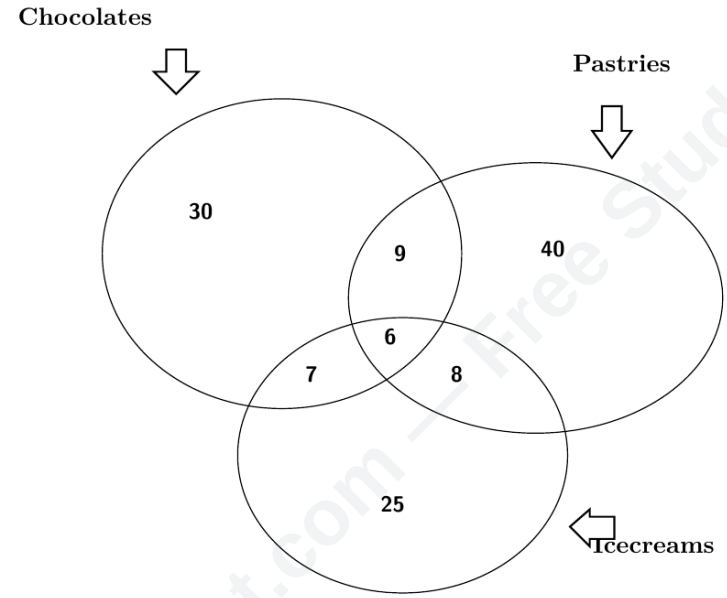
(a) 752800
(b) 976000
(c) 658200
(d) 876000

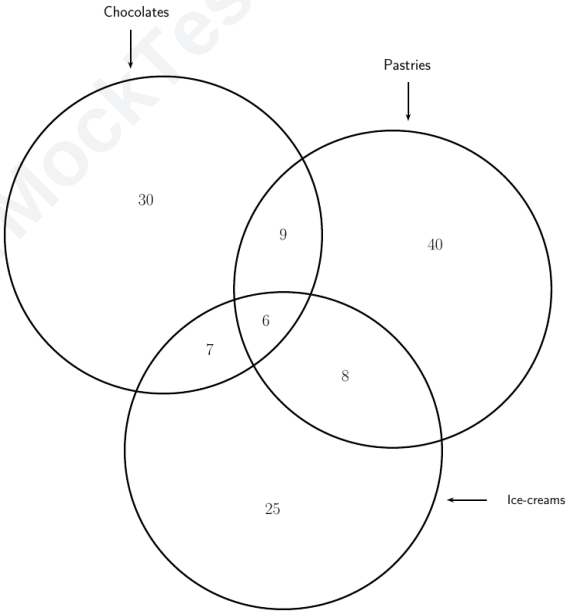
Q74. Which of the following is not an advantage of using mobile governance using ICT?

(a) Reduced costs for the government
(b) Better access to government services for citizens
(c) Increased transparency and accountability in government
(d) Increasing the efficiency of government processes

Q75. Study the given diagram carefully and answer the question given below. The numbers in different sections represent the number of children who like different desserts.

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How many children like both pastries and ice cream but not chocolate?

(a) 9
(b) 6
(c) 7
(d) 8

Q76. The rate of doing work is known as _____.

(a) Power
(b) Force
(c) Kinetic energy
(d) Potential energy

Q77. Which of the following actions help prevent injuries from slips and falls?

(a) Wearing loose shoes for comfort
(b) Walk carefully on wet floors
(c) Cleaning up spills immediately and using warning signs
(d) Ignoring clutter on the sidewalk

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Q78. In the following series, only one letter-cluster is wrong. Choose the wrong letter-cluster.

PCO MEM JGK GIJ DKG AME

(a) AME
(b) JGK
(c) DKG
(d) GIJ

Q79. Which of the following statements about geometric shapes is/are true?

1. Geometric shapes are enclosed figures formed by joining two or more points, lines, or curves.
2. Geometric shapes are always open-ended and made up of only straight lines.

(a) Only statement 1 is true
(b) Only statement 2 is true
(c) Both statements 1 and 2 are true
(d) Neither statement 1 nor 2 is true

Q80. A tank has two inlets, I1 and I2. I1 alone can fill it in 8 hours, and I2 alone can fill it in 4 hours. If both inlets are open, how long will it take to fill the tank?

(a) 2 hours
(b) 22/3 hours
(c) 32/3 hours
(d) 42/3 hours

Q81. A 280 m long train travelling at a speed of 72 km/hr crosses a platform in 30 seconds. Find the length (in m) of the platform.

(a) 335
(b) 280
(c) 300
(d) 320

Q82. Amit's income in 2019 was Rs. 27,000. His income increases by 10% each year. What was his income (in Rs.) in 2021?

(a) 32,400
(b) 29,700
(c) 32,670
(d) 27,000

Q83. Which of the following is the best way to identify hazards at the workplace?

(a) Waiting for an event to occur
(b) Performing regular safety inspections
(c) Relying on employees to report accidents
(d) Ignoring small risks

Q84. Given below are two sets of numbers. In each set, performing certain mathematical operations on the first number gives the second number. Similarly, performing certain mathematical operations on the second number gives the third number, and so on. Which of the given options follows the same set of operations as the given sets?

(Note: Operations must be performed on whole numbers without breaking the numbers into their component digits. For example, take 13. Operations such as addition, subtraction, multiplication, etc. can be performed on 13. Breaking 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not permitted.)

3-9-12-24; 4-16-20-40

(a) 9-2-11-24
(b) 1-1-2-4
(c) 6-12-18-34
(d) 7-49-56-122

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Q85. Which of the following will verify the credentials and documents of applicants uploaded on the National Scholarship Portal?

(a) National Scholarship Portal
(b) The University/Institute in which the applicant is studying.
(c) Third Party
(d) Government

Q86. The average of three numbers is 20. If two numbers are 16 and 24, find the third number.

(a) 22
(b) 21
(c) 20
(d) 19

Q87. Which of the following statements is/are true?

Statement 1: Heat conductors allow heat to pass through them easily.

Statement 2: All plastics are good conductors of heat.

(a) Only statement 1
(b) Only statement 2
(c) Neither statement 1 nor statement 2
(d) Both statement 1 and statement 2

Q88. In the following number-pairs, the second number is obtained by performing certain mathematical operations on the first number. What number should be replaced by X and Y so that the pattern followed by the two numbers to the left of :: is the same as the pattern followed by the two numbers to the right of ::?

(Note: Operations must be performed on whole numbers, without breaking the numbers into their component digits. For example, take 13. Operations such as addition/subtraction/multiplication can be performed on 13. Breaking 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not permitted.)

X: 85 :: 36: Y

(a) x = 44, Y = 73
(b) x = 42, Y = 73
(c) x = 43, Y = 77
(d) x = 42, Y = 71

Q89. Jaspreet deposited Rs. 58,550 at 20% annual interest rate compounded annually. What is the total amount (in Rs.) Jaspreet will receive after 2 years ?

(a) 84,700
(b) 84,312
(c) 84,735
(d) 83,876

Q90. Rinku travels 136 meters in his car in 17 seconds. Find his speed (in km/hr).

(a) 11.6
(b) 17
(c) 28.8
(d) 26

Q91. What should come in place of question mark (?) in the given series?

893 891 889 887 ? 883

(a) 986
(b) 885
(c) 985
(d) 886

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Q92. Ten people are sitting in two parallel rows, five in each row, in such a way that there is an equal distance between adjacent persons.

Row I contains A, B, C, D, and E, all of whom are facing south. Row II contains R, S, T, U and V, all of whom are facing north. Thus, each person faces a person from the other row. A sits at the right end of his row and faces U. R sits in the middle of his row and faces C. E sits between C and D, facing T. S sits at the right end of his row.

Who sits exactly opposite B?

(a) T
(b) R
(c) U
(d) V

Q93. What type of thermometer is used to measure the internal temperature of ice?

(a) Digital thermometer
(b) Clinical thermometer
(c) Infrared thermometer
(d) Laboratory Thermometer

Q94. An ammeter with a range of 0 to 10 A reads a current of 7.5 A. If its actual value is 6.2 A, the relative error is _____.

(a) 13%
(b) 17.33%
(c) 20.96%
(d) 4.8%

Q95. The average of 5 results is 51 and the average of the first 4 of them is 50. The 5th result is.

(a) 55
(b) 50
(c) 51
(d) 54

Q96. A copper spoon is dipped in hot water. What happens to the other end?

(a) It gets heated by conduction.
(b) It cools down by conduction.
(c) It gets heated by convection.
(d) It cools down by convection.

Q97. Based on the English alphabetical order, three of the following four letter-clusters are alike in a certain way and thus form a group. Which of the given letter-clusters does not belong to that group? (Note: The odd letter-cluster is not based on the number of consonants/vowels or their position in the letter-cluster.)

(a) GMOT
(b) FLNS
(c) NTVB
(d) LRTY

Q98. A rod of length 8/9 meters breaks into two pieces. If one piece is 1/3 meters long, find the length (in m) of the other piece.

(a) 2/9
(b) 7/9
(c) 5/9
(d) 4/9

Q99. This question is in Hindi. Read it online.

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Q100. An object weighs 60 N on Earth. What will be its weight on the surface of the Moon?

(a) 600 N
(b) 10 N
(c) 6 N
(d) 60 N

PART B

Q101. Which of the following types of compressors has up to 10 cylinders and is most frequently used in car air-condioning systems?

(a) Wobble plate compressor
(b) Scroll type compressor
(c) Hermec compressor
(d) Swash plate compressor

Q102. Read the given statements carefully and select the correct option.

Statement 1: In frost-free refrigerator, evaporator fan and condenser fan produces uniform cooling.

Statement 2: In conventional type refrigerator, no fan is provided hence the cooling is not uniform cooling/freezing.

(a) Both Statement 1 and Statement 2 are correct.
(b) Statement 1 is correct and Statement 2 is incorrect.
(c) Statement 2 is correct and Statement 1 is incorrect.
(d) Both Statement 1 and Statement 2 are incorrect.

Q103. Which of the following hand-operated drilling machines is used for drilling small diameter holes up to 6 mm?

(a) Electric hand drill
(b) Bevel gear type drilling machine
(c) Breast drilling machine
(d) Ratchet drilling machine

Q104. Which of the following is an important safety measure during a power failure?

(a) Using candles for lighting
(b) Ignoring alarm systems
(c) Continuing to use equipment without verifying power status
(d) Ensuring all machines and electrical equipment are turned off

Q105. Match the refrigerant control expansion valves with their correct functions.

Refrigerant controls	Functions
A. Suction-line regulators	P. Limit the flow of gas to the compressor to prevent s loads
B. Check valves	Q. Interrupt the flow on demand from any one of sev temperature or pressure-sensing devices
C. Solenoid valves	R. Prevent the flow of gas from the condenser
D. Hold back valves	S. Control the flow of refrigerant gas from the evaporator

(a) A-S, B-P, C-Q, D-R
(b) A-S, B-R, C-Q, D-P
(c) A-S, B-R, C-P, D-Q
(d) A-P, B-R, C-Q, D-S

Q106. What is the primary reason for electrical injuries when a person comes in contact with electrical equipment?

(a) Electrical devices are too powerful.
(b) Electrical equipment is not properly grounded.
(c) Current flows through the body causing harm

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(d) Devices are used for too long.

Q107. When using a multimeter to measure current, which of the following is correct?

(a) The multimeter is connected in series with the load.
(b) The multimeter is connected directly to the power source.
(c) The multimeter is connected in parallel with the load.
(d) The multimeter is connected only across resistive components.

Q108. In a refrigeration system, an electronic expansion valve is a _____.

(a) device used to store heat during normal operation of the cycle
(b) device used to remove the frost by melting
(c) device used to measure the moisture content of the air
(d) device that meters or regulates the flow of liquid refrigerant to the evaporator

Q109. Which of the following components of the flake ice machine is a vertically placed drum-shaped stainless-steel container, equipped with the rotating blade?

(a) Tube ice generator
(b) Condenser
(c) Evaporator
(d) Compressor

Q110. What should you do to ensure your personal safety at work?

(a) Wear personal protective equipment.
(b) Take risks to finish tasks quickly.
(c) Ignore warning signs and instructions
(d) Work in a hurry without checking equipment.

Q111. Which of the following components of a storage-type water cooler gives initial power for starting winding at the compressor needed and cuts off power supply at running?

(a) Relay
(b) Overload protector
(c) Thermostat
(d) Fan motor

Q112. Which of the following advantages of AC motor over DC motor is INCORRECT?

(a) AC motors have higher startup power demands.
(b) AC motors are more efficient than DC motors.
(c) AC motors are more durable and have a longer life expectancy than DC motors.
(d) AC motors have fewer moving parts than DC motors.

Q113. _____ is the process of adding moisture to the air without affecting its dry bulb temperature.

(a) Humidification
(b) De-humidification
(c) Isothermal process
(d) Adiabatic process

Q114. In refrigeration and air conditioning systems, balance valves are also called the _____.

(a) coil setter
(b) circuit setter
(c) circuit breaker
(d) fan coil setter

Q115. When selecting a sheet size for an original drawing, what should be the primary consideration?

(a) The clarity and resolution required.
(b) The orientation of the drawing (horizontal or vertical).
(c) The size of the reproduction.

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(d) The standard size of the drawing office

Q116. What is the purpose of an emergency evacuation plan?

(a) To ensure safe and orderly evacuation during emergencies
(b) To increase productivity
(c) To avoid safety drills
(d) To allow workers to leave early

Q117. In the operations of a cold storage plant, _____ is used to protect the plant components against unusual working conditions.

(a) Safety control
(b) Temperature control
(c) Fluid control
(d) Moisture control

Q118. In which of the following types of refrigeration system, a lighter gas compared to the refrigerant vapour is introduced into the system?

(a) Liquid gas refrigeration system
(b) Dry ice refrigeration system
(c) Ice refrigeration system
(d) Three fluid absorption system

Q119. _____ exists when a system changes its state due to temperature difference between the system and its surroundings.

(a) Work
(b) Diffusion
(c) Mass flow
(d) Heat

Q120. In refrigeration systems, 'FCU' stands for _____.

(a) Freezer Control Unit
(b) Freezer Coil Unit
(c) Fan Coil Unit
(d) Fan Control Unit

Q121. In horizontal type bottle coolers, _____ air convection is present inside the storage cooling compartment.

(a) forced
(b) obligatory
(c) natural
(d) neutral

Q122. Which of the following are the two methods of charging refrigerants into systems?

(a) Charging by specific volume and Charging by diffusivity
(b) Charging by density and Charging by colour
(c) Charging by weight and Charging by volume
(d) Charging by viscosity and Charging by volume

Q123. Gaskets, seals and spacers are made using:

(a) prick punch
(b) pin punch
(c) hollow punch
(d) centre punch

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Q124. Which of the following types of pliers is used to shape loops in wires and to form curves in light metal strips?

(a) Flat nose pliers
(b) Round nose pliers
(c) End cutting pliers
(d) Slip-joint pliers

Q125. A circuit consists of three resistors; 15 ohms, 10 ohms, and 20 ohms. The 15-ohm resistor is in series with the parallel combination of the 10-ohm and 20-ohm resistors. If a 24 V battery is applied across the circuit, what is the total current flowing through the circuit?

(a) 0.1 A
(b) 2.1 A
(c) 1.1 A
(d) 3.1 A

Q126. In a velocity-time graph, the negative slope represents _____.

(a) displacement
(b) distance
(c) acceleration
(d) retardation

Q127. What are 'Thermal insulators' in Refrigeration and Air Conditioning systems?

(a) Materials that retard or offer resistance to the flow of heat through it
(b) Materials that retard or offer resistance to the friction
(c) Materials that retard or offer resistance to the flow of air through it
(d) Materials that retard or offer resistance to the flow of water through it

Q128. What is a refrigeration system?

(a) The equipment employed to maintain a system at a low temperature.
(b) The equipment employed to maintain a system at a high temperature.
(c) The equipment employed to maintain a system at a high pressure
(d) The equipment employed to maintain a system at a low pressure.

Q129. A circular hole of radius 3 cm is cut from a rectangular sheet of dimensions 12 cm × 10 cm. Find the remaining area. (Take π = 3.14)

(a) 75.74 cm^2
(b) 91.74 cm^2
(c) 95.86 cm^2
(d) 100 cm^2

Q130. Which of the following is INCORRECT regarding the cleaning and care of split AC systems?

(a) When removing and replacing the air filters, be sure to touch the heat exchanger
(b) Be sure the intake grille is installed securely
(c) Before cleaning the AC, be sure to turn it off and disconnect the power supply cord
(d) After washing, allow it to dry thoroughly in a shaded place

Q131. What is a key advantage of using MOSFETs in electronic circuits compared to other types of transistors?

(a) High frequency response
(b) Ability to amplify both AC and DC signals
(c) Ability to handle higher voltages and currents than BJTs
(d) High input impedance and low power consumption

Q132. What is the sum of (3/8) + (5/12) ?

(a) 8/20
(b) 17/24
(c) 19/24

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(d) 7/12

Q133. Which of the following files is used for filing narrow grooves and angles above 10°?

(a) Square file
(b) Knife-edge file
(c) Half round file
(d) Triangular file

Q134. A drawing instrument box is used to carry all _____ instruments.

(a) casting
(b) screening
(c) drilling
(d) drawing

Q135. Which of the following organisations is responsible for enforcing workplace safety regulations in India?

(a) Environmental Protection Agency (EPA)
(b) Directorate General of Factory Advice Service and Labour Institutes (DGFASLI)
(c) World Health Organization (WHO)
(d) Food and Drug Administration (FDA)

Q136. _____ moves from one point to another through air in air conditioning systems.

(a) Water borne sound
(b) Structure borne sound
(c) Refrigerent borne sound
(d) Air borne sound

Q137. Which of the following factors should be controlled in order to keep constant temperature throughout the conditioned space?

(a) Motion of air
(b) Humidity of air
(c) Purity of air
(d) Temperature of air

Q138. In an automotive air conditioning system compressor, the pistons are operated by a _____, which moves them backwards and forwards in the cylinders.

(a) wobble plate
(b) crank shaft
(c) connecting rod
(d) gear plate

Q139. What is the advantage of giving heat treatment to a material?

(a) To make surgical knives of sharp edges
(b) To decrease the melting point of the material
(c) To increase the weight of the material
(d) To change it from one element to another element

Q140. The _____ device is used for producing cold in a refrigeration system.

(a) condenser
(b) economiser
(c) manifold gauge tool
(d) vortex tube

Q141. In which of the following types of cooling towers are the eliminators fitted just below the fan and spray nozzles fitted just below the eliminator?

(a) Forced draft cooling tower
(b) Induced draft cooling tower

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(c) Hyperbolic draft cooling tower
(d) Natural draft cooling tower

Q142. In industrial air conditioning systems, a pipe line is provided from the condenser to the cooling tower to circulate _____.
(a) chlorine
(b) water
(c) gas
(d) air

Q143. Which of the following motors is used for condensing units and cooling coils of bottle coolers?
(a) Squirrel cage induction motor
(b) Shaded pole induction motor
(c) Capacitor-start capacitor-run induction motor
(d) Slip ring induction motor

Q144. Which of the following processes of maintaining central AC always follows the detailed instructions provided by equipment manufactures or system designers?
(a) Post start-up checks
(b) Pre-start-up checks
(c) Starting procedure
(d) Log sheets

Q145. Which of the following electrical components is used in the refrigeration system to protect the compressor from abnormal operating condition?
(a) Fan motor
(b) PTC relay
(c) Overload protector
(d) Defrost heater

Q146. If $\sin\theta = 3/5$, find $\cos\theta$
(a) 5/4
(b) 3/4
(c) 3/5
(d) 4/5

Q147. When measuring the resistance of a resistor using an ohmmeter, what does a reading of zero resistance indicate?
(a) The resistor is open-circuited.
(b) The ohmmeter is malfunctioning.
(c) The resistor is functioning normally.
(d) The resistor is short-circuited.

Q148. For what purpose are pins and clips used in engineering drawings?
(a) To transfer dimensions and dividing lines into a number of equal parts
(b) To fasten the drawing sheet on to the drawing board firmly so that it does not shake
(c) To draw horizontal lines, parallel lines and to guide/hold the set squares
(d) To support the drawing paper/tracing paper for making drawings

Q149. In a vapor compression system, the condensed liquid refrigerant from the condenser is stored in a vessel known as _____.
(a) expansion valve
(b) condenser
(c) evaporator
(d) receiver

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Q150. Which of the following factors is responsible for the maintenance of any desired temperature within an enclosed space even though the temperature of the outside air is above or below the desired room temperature?

(a) Temperature of air
(b) Humidity of air
(c) Motion of air
(d) Purity of air

Q151. _____ is a type of refrigerated cabinet that displays merchandise as well as cools it.

(a) Undercounter cooler
(b) Visible heater
(c) Visible cooler
(d) Hidden cooler

Q152. According to BIS SP 46-2003, which of the following applications is correctly represented by a chain-thin line in engineering drawings?

(a) Dimension lines
(b) Visible edges
(c) Center lines
(d) Hidden edges

Q153. Which of the following vices consists of a handle and a small collet chuck at one end?

(a) Pipe vice
(b) Toolmaker’s vice
(c) Hand vice
(d) Pin vice

Q154. In the refrigeration system, _____ refrigerants are the heat carriers that directly cool the material by absorbing latent heat.

(a) primary
(b) secondary
(c) nitrogen
(d) highly flammable

Q155. Which of the following parts of a thermostatic expansion valve transmits the diaphragm force to spring to control the flow?

(a) Superheat spring
(b) Push rod and ball valve
(c) Body sealing gasket
(d) Spring retainer

Q156. Which of the following parts of a file is the part fitted to the tang for holding the file?

(a) Edge
(b) Tip or Point
(c) Tang
(d) Handle

Q157. If the diameter of the bare tube coil evaporators is too small, then:

(a) the system efficiency reduces
(b) the pressure drop due to friction becomes zero
(c) the pressure drop due to friction becomes too low
(d) the system efficiency increases

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Q158. Which of the following components of a walk-in cooler is required on freezers to prevent drain line freeze up?

(a) Condensate water evaporator
(b) Drain line heater
(c) Condenser unit rack
(d) Heat exchanger

Q159. Non-functional dimensions are _____.

(a) directly derived from the values given on a drawing
(b) essential for the function of the space or component
(c) derived from the values of the related features of a drawing
(d) not essential for the function of the space or component

Q160. Why is it important for every person to follow safety procedures in the workplace?

(a) To minimise risks and avoid accidents
(b) To reduce operational costs significantly
(c) To limit the need for frequent supervision
(d) To increase overall production efficiency

Q161. The _____ in an air-conditioning system allows heat to flow from the hot refrigerant to the cooler outside air.

(a) compressor
(b) condenser
(c) turbine
(d) evaporator

Q162. Match the components in Column A with those in Column B.

Column A	Column B
(A) Thermometer	(P) Measuring solar intensity
(B) Pyrometer	(Q) Measuring pressure
(C) Barometer	(R) Measuring high temperatures
(D) Pyrometer	(S) Measuring ordinary temperatures

(a) A-S, B-R, C-Q, D-P
(b) A-S, B-Q, C-R, D-P
(c) A-P, B-R, C-Q, D-S
(d) A-Q, B-R, C-S, D-P

Q163. In Duct Insulation of Refrigeration and Air-Conditioning, EPDM stands for _____.

(a) Ethylene Propylene Diene Material
(b) Ethylene Propylene Diene Monomer
(c) Ethylene Polymer Diene Monomer
(d) Ethyl Propylene Dual Monomer

Q164. In an air-conditioning system, butterfly dampers and multiple vane dampers are _____.

(a) duct air-flow controls
(b) condensers
(c) duct water-flow controls
(d) evaporators

Q165. Which of the following components of an automotive AC system store refrigerant, filter particles, absorb moisture and separate vaporous R134a from liquid R134a?

(a) Accumulator
(b) Condenser
(c) Evaporator

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(d) Compressor

Q166. In a lead-acid battery, what is the chemical composition of the material used for the positive plate during discharge?

(a) Lead (Pb)
(b) Lead dioxide (PbO_2)
(c) Sulphuric acid (H_2SO_4)
(d) Lead sulfate ($PbSO_4$)

Q167. _____ is the space where heat exchange takes place in direct expansion plants of Central Industrial Air Conditioning systems.

(a) Air Handling Unit
(b) Aerosol Handling Unit
(c) Automotive Handling Unit
(d) Automobile Handling Unit

Q168. Which of the following parts of the softy machine admits and shuts the flow of an ice cream?

(a) Churner shaft with conveyor
(b) Ice cream outlet valve
(c) Shaft bearing
(d) Sight glass

Q169. The liquid can get sub-cooled below the saturation temperature in the:

(a) compressor
(b) evaporator
(c) expander
(d) condenser

Q170. Arrange the following steps in the correct order to draw an equilateral triangle with each side of 35 mm.

1. Join CA and CB.
2. Draw a line and mark AB 35 mm as the side of the triangle.
3. With radius AB and center A and B, draw arcs cutting at C.
4. ABC is the required triangle.

(a) 3, 2, 1, 4
(b) 2, 1, 3, 4
(c) 2, 3, 1, 4
(d) 1, 2, 4, 3

Q171. What is the function of a condenser in air-conditioning systems?

(a) Prevents chocking of cooling air
(b) Picks up heat from return air
(c) Blows the cool air to the duct
(d) Rejects heat from refrigerant vapour and turns it to liquid

Q172. The unit for specific gravity is _____.

(a) g/cm^3
(b) kg/m^3
(c) m/s^2
(d) no unit (dimensionless)

Q173. Which of the following statements is/are correct about a commercial refrigeration system?

Statement 1: Condenser water inlet picks up heat from the gas so that it condenses.

Statement 2: Condenser water outlet connects hot water to the cooling tower.

(a) Neither statement 1 nor statement 2 is correct.
(b) Only statement 2 is correct.
(c) Only statement 1 is correct.

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(d) Both statement 1 and statement 2 are correct.

Q174. If the current flowing through a conductor is 5 A and the resistance of the conductor is 10 ohms, what will be the voltage across the conductor, according to Ohm's Law?

(a) 15 V
(b) 50 V
(c) 10 V
(d) 5 V

Q175. The low side component of the vapour compression refrigeration system, where the refrigerant absorbs heat by evaporating, is _____.

(a) condenser
(b) discharge line
(c) suction line
(d) compressor

ANSWER KEY

1	a	2	a	3	a	4	a	5	a	6	a	7	a	8	a	9	a	10	a
11	a	12	a	13	a	14	a	15	a	16	a	17	a	18	a	19	a	20	a
21	a	22	a	23	a	24	a	25	a	26	a	27	a	28	a	29	a	30	a
31	a	32	a	33	a	34	a	35	a	36	a	37	a	38	a	39	a	40	a
41	a	42	a	43	a	44	a	45	a	46	a	47	a	48	a	49	a	50	a
51	a	52	a	53	a	54	a	55	a	56	a	57	a	58	a	59	a	60	a
61	a	62	a	63	a	64	a	65	a	66	a	67	a	68	a	69	a	70	a
71	a	72	a	73	a	74	a	75	a	76	a	77	a	78	a	79	a	80	a
81	a	82	a	83	a	84	a	85	a	86	a	87	a	88	a	89	a	90	a
91	a	92	a	93	a	94	a	95	a	96	a	97	a	98	a	99	a	100	a
101	a	102	a	103	a	104	a	105	a	106	a	107	a	108	a	109	a	110	a
111	a	112	a	113	a	114	a	115	a	116	a	117	a	118	a	119	a	120	a
121	a	122	a	123	a	124	a	125	a	126	a	127	a	128	a	129	a	130	a
131	a	132	a	133	a	134	a	135	a	136	a	137	a	138	a	139	a	140	a
141	a	142	a	143	a	144	a	145	a	146	a	147	a	148	a	149	a	150	a
151	a	152	a	153	a	154	a	155	a	156	a	157	a	158	a	159	a	160	a
161	a	162	a	163	a	164	a	165	a	166	a	167	a	168	a	169	a	170	a
171	a	172	a	173	a	174	a	175	a										

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