RRB ALP CBT-II (Electrician) Official Paper (Held On: 06 May, 2025 Shift 1) (Previous Year Paper)

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

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PART A

Q1. In this question, a statement is given followed by two courses of action, numbered I and II. You must assume everything in the statement to be true, and on the basis of the information given in the statement, decide which of the given courses of action logically follow(s) for pursuing.

Statement:

A major fire broke out this afternoon in a mall in Jaipur, causing several casualties amongst the people present inside.

Courses of Action:

The police must check to see if the fire safety regulations were followed by the mall.

Traffic police must divert traffic away from the fire site, to enable evacuation of people.

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

Q2. The taxi charges in a city consist of a fixed charge together with the charge per kilometre for the distance covered. For a distance of 35 km, the charge paid is Rs. 375 and for a distance of 48 km, the charge paid is Rs. 427. Find the fixed charges and the charge per km (in Rs.), respectively.

(a) 220 and 6
(b) 227 and 5
(c) 235 and 4
(d) 275 and 3

Q3. Which technology operates through an electrochemical process that transforms the energy stored in hydrogen gas (H2) and oxygen into electrical power without combustion?

(a) Hydroelectric power
(b) Solar thermal power
(c) Hydrogen fuel cells
(d) Wind power

Q4. Seema is twice as old as Alka. If nine years is subtracted from Alka's age and six years is added to Seema's age, then Seema will be four times Alka's age. How old was Alka three years ago?

(a) 18 years
(b) 21 years
(c) 16 years
(d) 20 years

Q5. 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 conclusion(s) logically follow(s) from the statements.

Statements:

Some ships are boats.

All boats are submarines.

Some submarines are yachts

Conclusions:

(I) Some yachts are boats.

(II) Some yachts are ships.

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

Q6. Eight people are sitting in two parallel rows containing 4 people each in such a way that there is equal distance between adjacent persons. In row 1 – A, B, C and D are seated and all of them are facing south. In row 2 – P, Q, R and S are seated and all of them are facing north. Thus each person faces another person from the other row. Only three people sit to the right of R. D faces the person who is the immediate neighbour of S and P. C faces the person who sits second to the left of S. R does not face A.

Who amongst the following faces B?

(a) R
(b) S
(c) P
(d) Q

Q7. In Engineering Drawing, which of the following is the correct definition of the term 'dimension'.

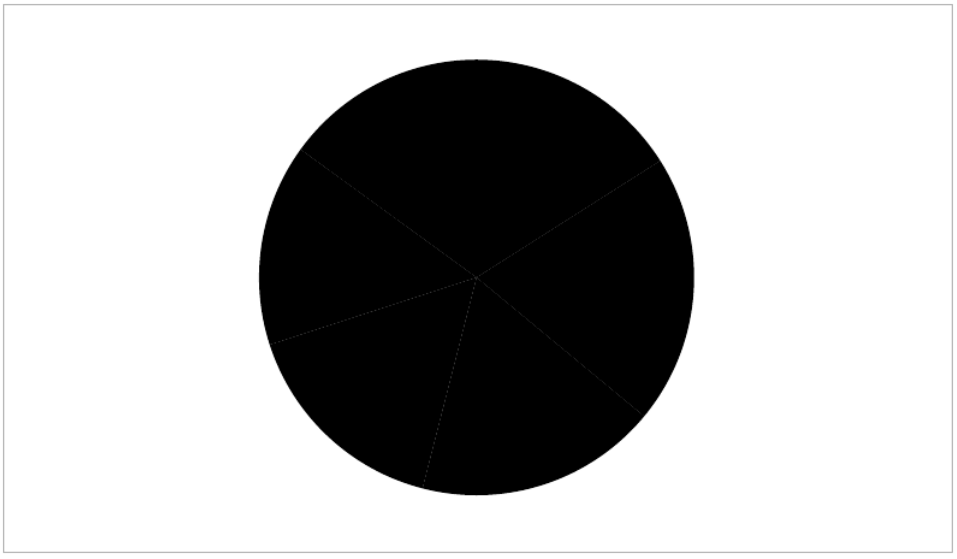
(a) The thickness of the line of a letter
(b) A continuous thick or wide line along which the prints are trimmed
(c) A line that is drawn to make a section evident
(d) A numerical value expressed in an appropriate unit of measurement

Q8. In a certain code language, ‘LOVE’ is coded as ‘8364’ and ‘EARS’ is coded as ‘3517’. What is the code for ‘E’ in the given code language?

(a) 7
(b) 5
(c) 3
(d) 4

Q9. Study the given pie chart and answer the question that follows.

The given pie chart indicates the percentage-wise breakup of students in different subjects. The total number of students in the college is 5000.



What is the ratio of the students studying Zoology to the students studying Botany?

(a) 15 : 14
(b) 15 : 16
(c) 14 : 15
(d) 16 : 15

Q10. Which of the following steps is essential when configuring a web browser to enhance both security and privacy for a user?

(a) Enabling pop-ups for all websites to improve user experience
(b) Setting the homepage to a frequently visited website for quick access
(c) Configuring the browser to block third-party cookies and enabling HTTPS-only mode
(d) Disabling the browser's cache to improve website loading times

Q11. Which of the following benefits can be obtained by conducting an energy audit in a commercial building?

(a) Increasing the cost of energy bills
(b) Identification of opportunities for energy savings
(c) Reduction in price of energy per its unit usage
(d) Reduced market value of building

Q12. What should come in place of the question mark (?) in the given series?

17 29 41 59 77 101 125 ?

(a) 175
(b) 161
(c) 155
(d) 149

Q13. Which of the following options is correct when two objects at the same temperature are kept in contact with each other?

(a) Both objects transfer heat to each other.
(b) Heat is transferred from object 2 to object 1.
(c) No heat is transferred.
(d) Heat is transferred from object 1 to object 2.

Q14. What will come in place of the question mark (?) in the following equation, if '+' and '−' are interchanged and '×' and '÷' are interchanged?

32 + 28 ÷ 3 × 4 − 15 = ?

(a) 32
(b) 26
(c) 29
(d) 20

Q15. Mangal starts from Point A and walks 14 m towards north. He takes a right turn, walks 9 m and then takes a right turn, walks 37 m, reaches Point B and stops. Jayanti starts from Point Z which is 15 m towards the east of Point B. She walks 11 m towards east, takes a left turn, walks 42 m, turns left and walks 63 m, turns left and walks 19 m and stops at Point Y. What is the shortest distance between Point A and Point Y? (All turns are 90 degree turns only.)

(a) 25 m
(b) 28 m
(c) 26 m
(d) 31 m

Q16. What is the amount of work done in moving a charge of 6 C from a point with a potential of 120 V to a point with a potential of 140 V?

(a) 840 J
(b) 120 J
(c) 720 J

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(d) 3.33 J

Q17. In a clearance sale of electronic items, an item whose marked price was Rs. 12,225 is now sold for Rs. 10,758, d% is the discount percentage on the item. The value of d is:

(a) 11%
(b) 14%
(c) 12%
(d) 13%

Q18. Which of the following is NOT a fundamental quantity in the SI system?

(a) Luminous intensity
(b) Amount of substance
(c) Time
(d) Force

Q19. Alloys are preferred over pure metals in electrical heating devices:

(a) because the resistivity of an alloy is generally higher than its constituent metals.
(b) because alloys oxidise (burn) readily at high temperatures.
(c) because the elasticity of an alloy is higher than that of its constituent metals.
(d) because the resistivity of an alloy is lower than that of its constituent metals.

Q20. Which of the following correctly describes the direction of electric current?

(a) From low potential to high potential
(b) Opposite to the direction of positive charge flow
(c) Same as the direction of electron flow
(d) Opposite to the direction of electron flow

Q21. Which of the following is an application of the 5S concept in a workshop?

(a) Increasing the number of safety supervisors
(b) Keeping tools and materials organised for easy access
(c) Removing safety protocols to improve efficiency
(d) Using extra tools without proper storage

Q22. Find the value of 96.86572 × 10^7.

(a) 96,86,57,200
(b) 0.9686572
(c) 96,86,572
(d) 9,68,65,720

Q23. Ampere is the SI unit of _____.

(a) electric current
(b) electric power
(c) electric charge
(d) mass

Q24. If a = 21 and b = 19, find the value of $(a^2 + b^2 + ab)/(a^3 - b^3)$.

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

Q25. What is the immediate action to take when a fire breaks out in a workplace?

(a) Ignore the fire and continue working
(b) Try to put it out using water without knowing the fire type
(c) Gather near the fire to observe the situation

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(d) Raise the alarm and evacuate the area

Q26. The floor of a rectangular hall is a square with a perimeter of 220 m. If the cost of painting the four walls at the rate of Rs. 10 per m^2 is Rs. 11,000, then find the volume of the hall.

(a) 15,125 m^3
(b) 19,200 m^3
(c) 19,520 m^3
(d) 18,250 m^3

Q27. The list price of an article is Rs. 5,000 and a discount of 70% is offered on the list price. What additional discount per cent on the already discounted price must be offered to a customer to bring the net selling price to Rs. 1,275?

(a) 10%
(b) 16%
(c) 18%
(d) 15%

Q28. Each of I, J, K, L, U, V and W has an exam on a different day of a week starting from Monday and ending on Sunday of the same week.J has the exam on Friday. Only two people have the exam between V and J. Only four people have the exam between L and V. U has the exam immediately after W. K does not have the exam on Monday.How many people have the exam before K and after I?

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

Q29. The median of the data 2, 6, 4, 8, 1, 2, 5, 8, 9, 10, 12, 9, 7, 8, 3, 1, 0, 9, 2, 5 is _____.

(a) 6
(b) 5.5
(c) 5
(d) 6.5

Q30. If an electric heater draws a current of 5 A when the potential difference across its terminals is 75 V, what current will it draw when the potential difference is increased to 150 V?

(a) 10 A
(b) 15 A
(c) 20 A
(d) 30 A

Q31. Two sets of numbers are given below. In each set of numbers, certain mathematical operation(s) on the first number results in the second number. Similarly, certain mathematical operation(s) on the second number results 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/subtracting/multiplying to 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed.)

11 – 121 – 221 – 171; 27 – 729 – 829 – 779

(a) 16 – 196 – 296 – 246
(b) 13 – 169 – 244 – 188
(c) 25 – 625 – 725 – 675
(d) 23 – 529 – 629 – 589

Q32. The HCF of two numbers is 62, and the other two factors of the LCM of these factors are 7 and 9. Which of the options given below can be a possible value of the smaller of the two numbers?

(a) 432
(b) 434
(c) 433
(d) 431

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Q33. If the sum of lengths of two adjacent sides of a parallelogram is 12 cm, then the perimeter of the parallelogram is:

(a) 34 cm
(b) 36 cm
(c) 20 cm
(d) 24 cm

Q34. How many base units are given in the SI system?

(a) 9
(b) 7
(c) 3
(d) 11

Q35. A is thrice as good a workman as B and together they can finish a piece of work in 12 days. In how many days can A alone finish the work?

(a) 14 days
(b) 12 days
(c) 16 days
(d) 18 days

Q36. Which of the following is NOT one of the 5S principles?

(a) Sustain
(b) Supervise
(c) Standardise
(d) Sort

Q37. 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 pair)

(a) DW – YA
(b) MF – HJ
(c) WP – RS
(d) SL – NP

Q38. Which of the following is a poor conductor of heat?

(a) Wool
(b) Steel spoon
(c) Copper
(d) Aluminium rod

Q39. Rakesh starts a business with a capital of Rs. 2,50,000. He incurs a loss of 5% during the first year. However, he makes a profit of 4% on his remaining investment during the second year. Finally, he makes a profit of 20% on his new capital during the third year. Find his total profit at the end of three years.

(a) Rs. 46,400
(b) Rs. 46,500
(c) Rs. 46,700
(d) Rs. 46,600

Q40. The resistances of 30 ohm, 20 ohm and 60 ohm are connected in parallel. The equivalent resistance of the combination is _____.

(a) 110 ohm
(b) 0.1 ohm
(c) 12 ohm
(d) 10 ohm

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Q41. What should come in place of the question mark (?) in the given series?

UT27, RQ25, NM23, ?

(a) IG21
(b) IH29
(c) JH19
(d) IH21

Q42. Refer to the following letter, number and symbol series and answer the question that follows. Counting to be done from left to right only.

(Left) K A T & 4 @ Y # 6 K & 2 R % 7 D 3 5 E * S (Right)

How many such symbols are there which are immediately preceded by a number and also immediately followed by a letter?

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

Q43. Match the following.

(A) Continuous thick lines	(P) Projection lines
(B) Hidden lines	(Q) Principal lines
(C) Outlines	(R) Dotted lines
(D) Extension lines	(S) Object lines

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

Q44. Which of the following is an example of uniform motion?

(a) A vehicle moving through a crowded area
(b) A train moving at a constant speed on a straight track
(c) A sprinter running a 100-metre race with varying speed
(d) A ball rolling down a slope

Q45. Two sets of numbers are given below. In each set of numbers, certain mathematical operation(s) on the first number results in the second number. Similarly, certain mathematical operation(s) on the second number results 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/subtracting/multiplying to 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed.)

24 – 48 – 108 – 36; 18 – 36 – 96 – 32

(a) 82 – 139 – 234 – 78
(b) 132 – 264 – 444 – 138
(c) 53 – 106 – 166 – 55
(d) 48 – 96 – 156 – 52

Q46. Match the following, according to lettering and numbering (uppercase lettering) as per BIS SP: 46-2003.

Width (W)	Capital letters
(A) 5	(I) W
(B) 6	(II) A, M, Q, V, X, Y
(C) 7	(III) B, D, G, H, K, N, O, P, R, S, T, U and Z

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(D) 9	(IV) C, E, F, L

(a) A-(I), B-(III), C-(II), D-(IV)
(b) A-(IV), B-(III), C-(II), D-(I)
(c) A-(IV), B-(III), C-(I), D-(II)
(d) A-(IV), B-(II), C-(III), D-(I)

Q47. An object of mass m is made to fall freely from a height h. As the object continues to fall, what will happen to its energy?
(a) The kinetic energy and potential energy will not change.
(b) The potential energy would decrease while the kinetic energy would increase.
(c) The potential energy would increase while the kinetic energy would decrease.
(d) The potential energy and kinetic energy will both increase.

Q48. A can complete a piece of work in 18 days. B can complete it in 14 days. With the assistance of C, they completed the work in 7 days. C alone can complete it in _____ days.
(a) 63
(b) 42
(c) 64
(d) 36

Q49. What should come in place of the question mark (?) in the given alpha-numeric series?
2M, 5O, 10R, 13T, 18W, 21Y, ?
(a) 26B
(b) 26C
(c) 24B
(d) 26A

Q50. The mode of 4, 6, 4, 6, 5, 7, 5, 7, 4, 6, 7, 6 is:
(a) 4
(b) 6
(c) 5
(d) 7

Q51. How fast should a cat of mass 15 kg run in order to have a kinetic energy of 120 J?
(a) 40 m/s
(b) 4 m/s
(c) 16 m/s
(d) 0.16 m/s

Q52. In a certain code language, ‘WILD’ is coded as ‘8164’ and ‘DOGS’ is coded as ‘3517’. What is the code for ‘D’ in the given code language?
(a) 4
(b) 1
(c) 3
(d) 5

Q53. Simran rides a distance of 60 m in one minute and then returns along the same straight path. The average velocity of her ride is _____.
(a) 0 m/s
(b) 2 m/s
(c) 1 m/s
(d) 60 m/s

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Q54. The resistance of a metallic wire is R. If the radius of the metallic wire is reduced to half of its initial value while keeping all other parameters the same, the new resistance becomes _____.

(a) R/4
(b) R/2
(c) 2R
(d) 4R

Q55. Select the pair that follows the same pattern as the one followed by the two sets of pairs given below. Both pairs follow the same pattern.

BSR : GQW

LOB : QMG

(a) RWH : WUM
(b) HVD : LTH
(c) KRW : NPZ
(d) QGT : TDW

Q56. If 11.6 : x :: x : 2.9, and x > 0, then find the value of x.

(a) 10.9
(b) 7.7
(c) 5.8
(d) 3.1

Q57. What is the first step when encountering a system failure in a workplace?

(a) Report the issue and follow the emergency protocol
(b) Ignore the failure and continue working
(c) Immediately restart all systems without inspection
(d) Disconnect all power sources permanently

Q58. What should come in place of the question mark (?) in the given series?

87 118 149 ? 211 242

(a) 188
(b) 171
(c) 180
(d) 199

Q59. Jaspreet deposited a sum of Rs. 12,800 at 5% rate of interest per annum, compounded annually. The total amount (in Rs.) received by Jaspreet after 2 years will be:

(a) 13,997
(b) 14,112
(c) 14,512
(d) 14,442

Q60. Which key combination is commonly used for copying text in many text editing applications in Windows?

(a) Ctrl+V
(b) Ctrl+S
(c) Ctrl+C
(d) Tab

Q61. How many significant figures are there in 4.700 m?

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

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Q62. In a business, Tushar invests in Rs. 10,000 and Salil invests in Rs. 20,000. Tushar received 10% of the profit for managing the business and the rest of the profit is divided in the ratio of their capitals. Find Tushar's share of the profit (in Rs.) in a profit of Rs. 14,400.

(a) 5,610
(b) 5,760
(c) 5,510
(d) 5,910

Q63. Which of the following correctly describes the role of DNS (Domain Name System) in internet architecture?

(a) DNS routes data packets to their destination across the internet.
(b) DNS translates domain names into IP addresses to allow browsers to locate web servers.
(c) DNS translates IP addresses into domain names to make them easier to remember.
(d) DNS secures the data transmitted over the internet by encrypting it.

Q64. Which of the following is an INCORRECT formula for power?

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

Q65. A boy goes to school at a speed of 5 km/hr. He returns at a speed of 14 km/hr. He takes a total of 8 hours for both going to school and returning. The distance (in km) between his home and school is:

(a) 29.5
(b) 27
(c) 28.6
(d) 31

Q66. Which of the following features allows the user to quickly find emails received from a specific sender?

(a) Archive
(b) Draft
(c) Filter
(d) Sort

Q67. If ‘A’ stands for ‘÷’, ‘B’ stands for ‘×’, ‘C’ stands for ‘+’ and ‘D’ stands for ‘−’, then what will come in place of the question mark (?) in the following equation?

35 A 7 C 9 B 3 D 16 = ?

(a) 21
(b) 18
(c) 16
(d) 10

Q68. What is the main function of the Transport Layer in the internet architecture?

(a) Reliable data transfer and error correction
(b) Data encapsulation
(c) Routing of packets
(d) IP addressing

Q69. A line in an engineering drawing is the _____.

(a) one-dimensional figure, which has length but no width
(b) dimensionless location in space or on a drawing sheet that has no width, height, or depth
(c) three-dimensional object with length, breadth, and height
(d) closed curve where all points are the same distance from a fixed centre point

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Q70. The heat developed in a 5 ohm resistor in 2 minutes when a 2A current passes through it is _____.

(a) 2400 J
(b) 500 J
(c) 1000 J
(d) 40 J

Q71. The areas of three adjacent faces of a solid cuboid are 162 cm^2, 144 cm^2 and 50 cm^2. What is the volume (in cm^3) of the cuboid?

(a) 1080
(b) 805
(c) 833
(d) 1365

Q72. Pihu starts her car at 9 a.m. to reach her office, which is 20 km away. She covers the first 10 km in 30 minutes and reaches her office at 10 a.m. Pihu's motion is _____.

(a) retarded motion
(b) non-uniform motion
(c) accelerated motion
(d) uniform motion

Q73. How does turning off unused electrical devices contribute to energy conservation?

(a) By lowering utility bills
(b) By enhancing device performance
(c) By degrading electrical devices
(d) By increasing energy use

Q74. An electric lamp with a resistance of 35 ohms and a conductor with a resistance of 5 ohms are connected to an 8 V battery in series. Calculate the current flowing through the circuit.

(a) 0.2 A
(b) 1.82 A
(c) 40 A
(d) 2 A

Q75. Calculate the energy possessed by an object of mass 10 kg when it is raised to a height of 5 m from the ground. Given: g = 9.8 m s^(-2).

(a) 500 J
(b) 450 J
(c) 490 J
(d) 400 J

Q76. If $(\sin\theta+\cos\theta)/(\sin\theta-\cos\theta)=12$ then the value of $(121\tan^2\theta - 3)/(169\cot^2\theta + 1)$ is:

(a) -83/21
(b) -83/61
(c) 83/61
(d) 83/21

Q77. E, F, G, H, P, Q, and R, are sitting around a circular table facing the centre. F sits fourth to the right of E. Only R sits between F and H. H is NOT an immediate neighbour of E. Only P sits between E and G.

How many people sit between G and Q when counted from the right of G?

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

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Q78. Find the value of $x^2 + y^2$, given that, $x = 7 + \sqrt{1}$, $y = 7 - \sqrt{1}$.

(a) 56
(b) 69
(c) 100
(d) 98

Q79. How do we find absolute error?

(a) Absolute error = Actual value/observed value
(b) Absolute error = Actual value × observed value
(c) Absolute error = Actual value + observed value
(d) Absolute error = Actual value − observed value

Q80. What is the main advantage of using solar energy over fossil fuels?

(a) Greenhouse gas emission is higher when solar energy is used.
(b) Solar energy extraction requires high operational cost when compared to fossil fuels.
(c) Solar energy requires mining and extraction, whereas fossil fuels are free of cost.
(d) Solar energy is abundantly available and renewable in nature.

Q81. Which of the following is an effective way to prevent electrical accidents in the workplace?

(a) Working on live wires with bare hands
(b) Using water to cool overheated electrical equipment
(c) Using insulated tools and wearing rubber gloves
(d) Ignoring minor electrical faults

Q82. Which term describes the maximum amount of solar energy that a photovoltaic (PV) system can convert into electricity under standard test conditions?

(a) Nameplate capacity
(b) Rated capacity
(c) Effective capacity
(d) Peak load

Q83. Aditya is using two thin blankets instead of one thick blanket in winter to keep himself warm because _____.

(a) the friction between the two blankets produces heat
(b) the air trapped between the blankets is a poor conductor of heat
(c) the blankets are at a higher temperature than the surroundings
(d) two blankets are cheaper than one thick blanket

Q84. In a certain code language, ‘BORE’ is coded as ‘8624’ and ‘TABS’ is coded as ‘3217’. What is the code for ‘B’ in the given code language?

(a) 7
(b) 1
(c) 2
(d) 8

Q85. Two trains of lengths 155 m and 160 m are running at speeds of 74 km/hr and 52 km/hr, respectively, on parallel tracks in opposite directions. In how many seconds will they pass each other?

(a) 9 seconds
(b) 14 seconds
(c) 7 seconds
(d) 18 seconds

Q86. In winters, people wear jacket because _____.

(a) it looks good
(b) fabric of jacket is a conductor of heat so it traps body heat
(c) fabric of jacket is an insulator of heat so it traps body heat

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(d) jacket allows the heat to flow from our body to surroundings

Q87. Akshay gets 2% increase in his sale amount in the first year and 25% in the second year. With that his present sale is Rs. 1,42,800. What was his sale (in Rs.) two years ago?

(a) 1,14,240
(b) 92,000
(c) 1,40,000
(d) 1,12,000

Q88. What is the scientific notation for 55,60,000 km?

(a) 5.56 × 10^6 km
(b) 5.56 × 10^4 km
(c) 55.6 × 10^4 km
(d) 556 × 10^6 km

Q89. Two containers, one painted black and the other painted white, have been kept in sunlight for one hour in the afternoon. Choose the correct observation.

(a) There is no effect on either container.
(b) The white container becomes hotter than the black container.
(c) The black container becomes hotter than the white container.
(d) Both containers become equally hot.

Q90. The energy possessed by an object by virtue of its motion is known as _____.

(a) kinetic energy
(b) potential energy
(c) heat energy
(d) light energy

Q91. Two sets of numbers are given below. In each set of numbers, certain mathematical operation(s) on the first number results in the second number. Similarly, certain mathematical operation(s) on the second number results 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/subtracting/multiplying to 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed.)

4 – 8 – 18 – 9

6 – 12 – 22 – 11

(a) 8 – 16 – 26 – 13
(b) 3 – 15 – 12 – 20
(c) 9 – 18 – 28 – 20
(d) 11 – 13 – 22 – 63

Q92. Which of the following is the temperature range in a clinical thermometer?

(a) 30°C to 43°C
(b) 35°C to 42°C
(c) 10°C to 45°C
(d) 31°C to 44°C

Q93. Which of the following groups represents conductors of heat?

(a) Wood, paper, silver
(b) Paper, copper, plastic
(c) Aluminium, silver, copper
(d) Aluminium, plastic, wood

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Q94. Select the triad that follows the same pattern as that followed by the two triads given below. Both triads follow the same pattern.

JK - LM - NO

TU - VW - XY

(a) DE - FG - HI
(b) DE - FG - KL
(c) WE - DF - HI
(d) DE - FB - DF

Q95. In Engineering Drawing, principal lines are drawn to represent _____.

(a) interior or hidden edges
(b) axes of cylindrical, conical or spherical objects
(c) visible edges and surface boundaries of objects
(d) wide lines along which the prints are trimmed

Q96. A fruit seller had some apples. He sells 40% of the apples and now has 900 apples. How many apples did he originally have?

(a) 1800
(b) 2250
(c) 1500
(d) 1350

Q97. 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 pair.)

(a) SA – WQ
(b) WE – AU
(c) DL – HB
(d) MU – QL

Q98. Which of the following represents an item with kinetic energy?

(a) An extended rubber band
(b) A stone in motion
(c) A book resting on a table
(d) A compressed spring

Q99. In a certain code language,

'A × B' means ‘A is the son 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 M related to T if ‘M × N % P + S − T’?

(a) Brother's wife's brother
(b) Brother's wife's father
(c) Brother's wife's father's brother
(d) Brother's wife's father's father

Q100. A person saves 50% of his income. If his expenditure is Rs. 640, then his income (in Rs.) is:

(a) 600
(b) 1,320
(c) 560
(d) 1,280

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PART B

Q101. Which of the following care and maintenance of a marking table is INCORRECT?

(a) The marking table should be protected from rust.
(b) The surface of the marking table should not be given a thin layer of oil.
(c) The marking table should be protected from damage.
(d) After use, the marking table should be cleaned with a soft cloth.

Q102. What is the primary purpose of preventive maintenance?

(a) To increase the workload of employees
(b) To eliminate the need for regular inspections
(c) To delay repairs until breakdowns occur
(d) To reduce unexpected equipment failures

Q103. What is the maximum total current allowed in a ring circuit as per IEE regulations?

(a) 10 amps
(b) 30 amps
(c) 20 amps
(d) 50 amps

Q104. In a circuit with a NTC type thermistor and a fixed resistor connected in series connected to a DC power supply, what will happen to the output voltage if there is a rise in temperature?

(a) The output voltage will remain constant.
(b) The output voltage will decrease.
(c) The output voltage will fluctuate depending on the resistor value.
(d) The output voltage will increase.

Q105. Which electrical component is used to perform a polarity test to check whether or not the switches are connected in phase/live cable?

(a) Ammeter
(b) Multimeter
(c) Test lamp
(d) Megger

Q106. A 100-mm centre-punch could have a 10-mm diameter body and a 6-mm diameter point ground to an angle of _____.

(a) 30°
(b) 120°
(c) 90°
(d) 60°

Q107. What is the importance of following the manufacturer's guidelines for DC motor maintenance?

(a) Ensures safe and efficient operation
(b) Saves time and resources
(c) Increases the motor's power output
(d) Modifies the motor's design

Q108. Which of the following actions is a part of the emergency response team's responsibilities during an active emergency?

(a) Scheduling regular evacuation drills
(b) Rescuing persons in immediate danger
(c) Preparing reports on emergency incidents
(d) Conducting routine safety checks

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Q109. Why is a DC compound generator preferred for industrial loads?

(a) It has constant voltage characteristics.
(b) It has no losses.
(c) It is easier to manufacture.
(d) It provides better efficiency.

Q110. What is the objective of testing an earthing system?

(a) To check the voltage levels
(b) To ensure the system has a low resistance path to the earth
(c) To measure the insulation resistance of cables
(d) To test the current capacity of the earthing system

Q111. How should the electrode resistance be measured if multiple earthing electrodes are used in parallel?

(a) Measure electrode resistance individually and then add it
(b) Use a clamp meter to measure the resistance of parallel electrodes
(c) Measure electrode resistance individually and then average the values
(d) Measure the total resistance of the combined electrodes in parallel

Q112. Which option shows the correct answer when 27°C is converted to the kelvin scale?

(a) – 246 K
(b) 300 K
(c) – 300 K
(d) 246 K

Q113. Read the Assertion (A) and Reason (R) carefully, and select the correct option.

Assertion (A): The earth resistance must be kept as low as possible to ensure that the earthing system is effective during fault conditions.

Reason (R): A low resistance allows fault current to flow easily into the ground, ensuring safety by preventing electrical hazards.

(a) Assertion (A) is correct, but Reason (R) is incorrect.
(b) Both Assertion (A) and Reason (R) are correct, and the reason correctly explains the assertion.
(c) Both Assertion (A) and Reason (R) are correct, but the reason does not correctly explain the assertion.
(d) Assertion (A) is incorrect, but Reason (R) is correct.

Q114. Which of the following statements about a star connected three phase system is correct?

(a) The neutral wire has higher voltage than the phase wires.
(b) The neutral wire is used for grounding purposes only.
(c) The neutral wire carries no current in case of balanced ideal load.
(d) There are two neutral wires in a star connected three phase system.

Q115. For which of the following calipers, a screw and nut are provided for opening and closing the caliper legs?

(a) Firm joint calipers
(b) Simple calipers
(c) Spring joint calipers
(d) Leg and point calipers

Q116. What are the two types of mica capacitors?

(a) Stacked foil and silvered mica capacitors
(b) Variable and fixed capacitors
(c) Electrolytic and paper capacitors
(d) Ceramic and film capacitors

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Q117. The accuracy of measurement by a try square is about:

(a) 0.002 mm per 10 mm length
(b) 0.001 mm per 10 mm length
(c) 0.02 mm per 10 mm length
(d) 0.004 mm per 10 mm length

Q118. Which of the following is a major risk associated with fuel spillage?

(a) Reduced need for ventilation
(b) Increased productivity
(c) Better lubrication for workshop floors
(d) Fire hazards and environmental contamination

Q119. Natural rubber is soft at high temperatures and brittle at low temperatures; hence raw rubber is heated with sulphur and other additives at a temperature range between 373 – 415 K to make it strong. This process is called _____ of rubber.

(a) latex
(b) vulcanisation
(c) molding
(d) extrusion

Q120. In an N-channel MOSFET, the drain current ID increases as _____.

(a) the source-to-drain voltage decreases
(b) the gate-to-source voltage decreases
(c) the drain-to-source voltage increases
(d) the gate-to-source voltage increases above the threshold voltage

Q121. A three phase circuit is connected with balanced delta connected load of impedance 100 Ω. If the current in each phase is 5 A, the voltage across each load will be _____.

(a) 250 V
(b) 150 V
(c) 200 V
(d) 500 V

Q122. Which of the following types of resistors is preferred for high-current applications?

(a) Carbon composition resistor
(b) Wire-wound resistor
(c) Variable resistor
(d) Film resistor

Q123. A statement and conclusion for pictorial drawing are given below. Determine the logical relationship between them.

Statement: Pictorial drawings are three-dimensional and provide a visual representation of an object.

Conclusion: Therefore, pictorial drawings are useful for describing the shape of a piece part or component.

(a) The conclusion is unrelated to the statement.
(b) The conclusion logically follows from the statement.
(c) The conclusion is partially supported by the statement.
(d) The conclusion does not logically follow from the statement.

Q124. What is the primary cause of sudden insulation resistance failure in a DC generator?

(a) Moisture ingress or contamination
(b) High ambient temperature
(c) Excessive armature current
(d) Increase in rotational speed

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Q125. Transformer oil should have _____ dielectric strength and _____ viscosity.

(a) low; low
(b) high; high
(c) low; high
(d) high; low

Q126. Which of the following is a primary difference between a primary and a secondary electrochemical cell?

(a) A secondary cell produces more energy than a primary cell.
(b) There is no difference between primary and secondary cells.
(c) A primary cell cannot be recharged, while a secondary cell can be recharged.
(d) A primary cell can be recharged, while a secondary cell cannot be recharged.

Q127. The energy stored (W) in an inductor is given by the formula _____, where C = Capacitance, V= Voltage, I = Current, and L= inductance.

(a) W=LI
(b) W=1/2VI
(c) $W=1/2CV^2$
(d) $W=1/2LI^2$

Q128. In the context of earthing system measurement, what does 'Earth resistance' refer to?

(a) The resistance between the live wire and the earth
(b) The ability of the ground to resist current flow
(c) The resistance between any two points of the ground with a distance of 1 metre
(d) The voltage required to activate the earthing system

Q129. In a logic circuit, three SPST (Single Pole Single Throw) switches are used to implement a logic gate. The switches are connected in series. What is the output of the circuit if all switches are closed?

(a) 1
(b) 0
(c) The output will depend on the type of gate used
(d) Undefined

Q130. Sine bars are used when a high degree of accuracy less than _____ is needed for measuring angles.

(a) 1 degree
(b) 30 degrees
(c) 1 minute
(d) 30 minutes

Q131. In pipe earthing, what is used to connect the earthing conductor to the pipe?

(a) Soldering
(b) Bolts and nuts
(c) Tape
(d) Welding

Q132. In the case of a three-phase system with an unbalanced load, which of the following is correct?

(a) The sum of the phase angles of each phase is always 120°.
(b) The sum of the line currents is not necessarily zero.
(c) The line voltages are always equal.
(d) In an unbalanced three-phase system, the neutral current is zero.

Q133. Which of the following is true when there is an unbalanced star connected load in a three-phase system?

(a) The current in the neutral terminal is zero
(b) Imbalance in phase voltages.
(c) The magnitude of current in each phase of the load is equal.
(d) The power factor in each phase of the load is equal.

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Q134. The Insulation Resistance value for a transformer is measured in:

(a) KVA
(b) kiloohms
(c) megaohms
(d) ohms

Q135. Why are alternators connected in parallel?

(a) To improve the power factor
(b) To increase the output frequency
(c) To increase the starting torque
(d) To meet greater power demand of load circuit

Q136. What is the pinch-off voltage in a FET?

(a) The voltage where the drain-to-source voltage causes breakdown
(b) The voltage at which the channel is "pinched off" and the current saturates
(c) The voltage at which the gate-to-source voltage is zero
(d) The voltage at which the drain-to-source current is maximised

Q137. Match the following designations of sheets with their respective trimmed sizes in length and breadth.

Designation	Trimmed Size
A) A0	P) 297 × 420
B) A1	Q) 420 × 594
C) A2	R) 594 × 841
D) A3	S) 841 × 1189

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

Q138. Two coils, A and B, have self-inductances of 120 μH and 300 μH, respectively. When a current of 1 A flows through coil A, it induces a flux linkage of 100 μWb turns in coil B. What is the mutual inductance between the coils?

(a) 300 μH
(b) 120 μH
(c) 50 μH
(d) 100 μH

Q139. Which DC motor type provides the best speed regulation under varying loads?

(a) Cumulative Motor
(b) DC Shunt Motor
(c) DC Series Motor
(d) Permanent Magnet DC Motor

Q140. The SI unit of 'ultimate stress' is _____.

(a) pascal (Pa)
(b) newton (N)
(c) joule per square meter (J/m^2)
(d) newton per meter (N/m)

Q141. Which of the following types of DC motor is commonly used in electric traction applications such as trains and trams?

(a) DC Shunt Motor
(b) DC Compound Motor

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(c) Permanent Magnet DC Motor
(d) DC Series Motor

Q142. Which device is used to protect against electric shocks and fires caused by earth leakage currents?
(a) MCB
(b) ECB
(c) MCCB
(d) ELCB

Q143. Which of the following screwdrivers has cross-shaped tips that are unlikely to slip from the cruciform slots in Philips recessed head screws?
(a) Ratchet screwdriver
(b) Cross-recess screwdriver
(c) Offset screwdriver
(d) Stumpy screwdriver

Q144. Which type of electrolytic capacitor is generally more stable and has better performance in small sizes?
(a) Tantalum capacitor
(b) Mica capacitor
(c) Aluminium capacitor
(d) Ceramic capacitor

Q145. According to Ohm's Law, how is current related to voltage and resistance?
(a) It is directly proportional to voltage and inversely proportional to resistance.
(b) It is inversely proportional to voltage and resistance.
(c) It is directly proportional to voltage and resistance.
(d) It has no relation with voltage or resistance.

Q146. IGBT (Insulated Gate Bipolar Transistor) has _____.
(a) low input impedance
(b) second breakdown problems
(c) high on-state resistance
(d) high input impedance

Q147. What is the primary reason for conducting a vehicle road test?
(a) To increase fuel efficiency
(b) To avoid the need for inspections
(c) To ensure the vehicle is functioning safely and correctly
(d) To test how fast the vehicle can go

Q148. The voltage regulation in percentage for transformer is given by:
(a) Voltage regulation = (V_(load)-V_(noload))/(V_(load))×100
(b) Voltage regulation = (V_(noload)-V_(load))/(V_(load))×100
(c) Voltage regulation = (V_(noload)-V_(load))/(V_(noload))×100
(d) Voltage regulation = (V_(noload)-V_(noload))/(V_(load))×100

Q149. An angle greater than 180 degrees is called a _____.
(a) Obtuse angle.
(b) Reflex angle.
(c) Acute angle.
(d) Right angle.

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Q150. Which of the following methods is used for synchronising a three-phase alternator?

(a) Kramer's Method
(b) Three Dark lamp method
(c) One Wattmeter method
(d) Using damper grids in pole faces

Q151. Which of the following is a key electrical safety tip in a workshop?

(a) Operate machines with wet hands
(b) Use water to clean electrical panels
(c) Ensure electrical equipment is properly grounded
(d) Ignore frayed wires if the device is still working

Q152. What is the primary reason for the heating effect in a conductor when an electric current passes through it?

(a) The electric field in the conductor causes heat generation.
(b) The conductor absorbs heat from the surrounding environment.
(c) The movement of electrons causes heat generation.
(d) The movement of protons causes heat generation.

Q153. Alternators are usually rated in:

(a) Kilo Volt Ampere
(b) Kilo Watt
(c) Kilo Volt Ampere Reactive
(d) Horse Power

Q154. Why do cars have treaded tyres?

(a) To increase speed
(b) To increase friction and grip on the road
(c) To decrease friction
(d) To reduce weight

Q155. In some programs, uppercase and lowercase letters are treated as different, for example, ‘yes’ and ‘YES’ are considered different inputs. Which term correctly describes such programs?

(a) Case-sensitive
(b) Case-insensitive
(c) Numerical
(d) Alphabetical

Q156. The correct instant of synchronising is when busbar and incoming machine voltages are of _____ magnitude and have _____ frequency.

(a) unequal, the same
(b) unequal, unequal
(c) equal, unequal
(d) equal, the same

Q157. Which of the following is a possible cause of an unbalanced load in a three-phase system?

(a) Differences in load resistance across phases
(b) Symmetrical load across phases
(c) Equal phase currents
(d) Balanced supply voltages

Q158. What is the unit of measurement for earth fault loop impedance?

(a) Volts (V)
(b) Amperes (A)
(c) Farads (F)
(d) Ohms (Ω)

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Q159. The RMS value of emf per phase of alternator is given by _____.

(Given: Φ = flux per pole, f = frequency of induced emf, T is the number of coils or turns per phase and Z is the number of conductors or coil sides in series/phase in an alternator)

(a) 2.22 ΦfT
(b) 4.44 ΦfZ
(c) 4.44 ΦZ
(d) 4.44 ΦfT

Q160. What is the primary purpose of shielding in electrical cables?

(a) To prevent heat loss from the cable
(b) To protect the cable from external electromagnetic interference
(c) To increase the voltage capacity of the cable
(d) To increase the current-carrying capacity of the cable

Q161. While performing short circuit test on a transformer to determine its parameter, instruments are placed on the:

(a) high voltage side, while the low voltage side is open circuit
(b) high voltage side, while the low voltage side is short circuit
(c) low voltage side, while the high voltage side is short circuit
(d) low voltage side, while the high voltage side is open circuit

Q162. Which of the following conversions are correct?

(a) 1 L = 1000 dm^3 and 1 mL = 1000 cm^3
(b) 1000 L = 1 dm^3 and 1 mL = 1000 cm^3
(c) 1000 L = 1 dm^3 and 1000 mL = 1 cm^3
(d) 1 L = 1 dm^3 and 1 mL = 1 cm^3

Q163. What should be the position of the ‘OFF’ marking on a fireman’s switch?

(a) In the centre
(b) At the top
(c) On the side
(d) At the bottom

Q164. What is the primary goal of the 5S concept?

(a) To eliminate the need for maintenance
(b) To replace traditional safety measures
(c) To improve workplace organisation and efficiency
(d) To increase the number of safety regulations

Q165. Which of the following statements is/are true about Non-Functional Dimensions (NF) in engineering drawing?

Statement 1: Non-functional Dimensions are shown without limits, as they do not affect the functionality of the component or space.

Statement 2: Non-Functional Dimensions are typically used for reference purposes only, and do not impact the assembly or performance of the component or space.

(a) Neither statement is true
(b) Both statements are true
(c) Only statement 2 is true
(d) Only statement 1 is true

Q166. In a transformer, insulation resistance test is carried out to measure:

(a) the inductance between different parts of the transformer
(b) the resistance of the insulation between windings and core
(c) frequency
(d) magnetic flux

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Q167. The primary difference between a FET and a BJT is that _____.

(a) FETs are current-controlled devices, while BJTs are voltage-controlled devices
(b) FETs have a lower input impedance than BJTs
(c) FETs are voltage-controlled devices, while BJTs are current-controlled devices
(d) BJTs are more sensitive to temperature than FETs

Q168. In crane and hoist applications, why is a DC series motor preferred over a DC shunt motor?

(a) It provides a high starting torque, which is required for lifting loads.
(b) It requires minimal maintenance compared to other motors.
(c) It maintains constant speed regardless of load variations.
(d) It consumes less power at no load.

Q169. The region of operation in a FET where the drain current is independent of the drain voltage and only depends on the gate-to-source voltage is called the _____.

(a) ohmic region
(b) cutoff region
(c) saturation region
(d) active region

Q170. Which of the following is INCORRECT about line standard?

(a) Quick measurements over a wide range
(b) More accurate due to line thickness
(c) Used to measure the distance between two engraved lines
(d) Subject to parallax error

Q171. What is the purpose of measuring the electrode resistance during the installation of an earthing system?

(a) To measure the insulation resistance of the system
(b) To ensure proper grounding of electrical equipment
(c) To determine the electrical load capacity of the system
(d) To ensure the earthing system has low impedance for fault current dissipation

Q172. A rectangular floor measuring 10 m × 8 m is to be tiled. If each tile covers 0.25 m^2, how many tiles are needed?

(a) 300
(b) 200
(c) 320
(d) 250

Q173. Connection of voltage transformer and current transformer across line are _____, respectively.

(a) parallel and series
(b) parallel and parallel
(c) series and series
(d) series and parallel

Q174. Which component in an MCB is responsible for detecting a short circuit?

(a) Handle
(b) Solenoid
(c) Bimetallic strip
(d) Arc chute

Q175. _____ recommend(s) 20 mm wide margins for sheet sizes AO and A1 in engineering drawings.

(a) Geographic coordinate systems
(b) Custom grids
(c) Grid reference system
(d) Borders and frames: SP: 46 (2003)

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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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