RRB ALP CBT-II (Fitter) Official Paper (Held On: 02 May, 2025 Shift 2) (Previous Year Paper)

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

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PART A

Q1. A wire of a certain material having length L and cross-sectional area A has a resistance of 2 Ω. What will be the resistance of another wire of the same material having length 2L and cross-sectional area A/2?

(a) 2 Ω
(b) 1Ω
(c) 8Ω
(d) 4Ω

Q2. In this question, statement I and statement II are given. These statements may be independent causes, effects of independent causes, or a common cause. One of these statements may be an effect of the other. Read both statements carefully and choose the correct answer.

I. The water level of the local river has reached its lowest level so far this summer, disrupting water supply to nearby towns.

II. Several power plants in the region have reported reduced power generation due to insufficient water for cooling processes.

(a) Both I and II are independent causes.
(b) II is the cause and I is its possible effect.
(c) Both I and II are effects of independent causes.
(d) I is the cause and II is its possible effect.

Q3. Identify the correct pair of Personal Protective Equipment (PPE) categories based on the nature of the hazard.

(a) Non-respiratory: Safety goggles, Respiratory: Safety gloves
(b) Non-respiratory: Nose mask, Respiratory: Safety boots
(c) Non-respiratory: Safety helmet, Respiratory: Nose mask
(d) Non-respiratory: Ear plugs, Respiratory: Safety shoes

Q4. Kaushik starts from point A and walks 32 m towards East. He turns right, walks 16 m and then turns right again, walks 14 m, reaches point B and stops. Chitra starts walking from point 2 which is 60 m east of point A. She walks 18 m north, turns right, walks 19 m, turns right and walks 65 m, turns right and walks 61 m and stops at point Y. What is the shortest distance between point B and point Y? (All turns are 90 degree turns only.)

(a) 33 m
(b) 29 m
(c) 31 m
(d) 25 m

Q5. Which of the following features is not available in Google Docs?

(a) Comment on text
(b) Insert images
(c) Create tables
(d) Track changes

Q6. Which of the following is an example of preventive maintenance?

(a) Ignoring minor faults to save costs
(b) Using equipment until failure occurs
(c) Waiting for a machine to break down before repairing it
(d) Conducting regular lubrication and inspections

Q7. Three of the following four letter-cluster pairs are alike in a certain way based on the English alphabetical order and thus form a group. Which of the following letter-cluster pairs does not belong to that group?

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

(a) WC-UL
(b) MS-KB
(c) DJ-BT
(d) TZ-RI

Q8. Which of the following processes is mainly responsible for the loss of heat from a hot vessel?

(a) Radiation
(b) Conduction
(c) Absorption
(d) Convection

Q9. If a force of 6 N is applied on a body, which is displaced 2m in the direction of force, then find the work done.

(a) 3 J
(b) 12 J
(c) 4 J
(d) 10 J

Q10. A class of 30 students took an exam, with the average score of 12 students being 68 and the average score of the rest being 70. What is the average score of the class?

(a) 67.2
(b) 69.2
(c) 70.2
(d) 68.2

Q11. Ohm's law for a given potential difference (V), current (I) and resistance (R) across a conductor is given as

(a) $I = VR$
(b) $V = I - R$
(c) $V = I + R$
(d) $V = IR$

Q12. How does the thermal pollution of water affect the water quality?

(a) Sediments get settled soon
(b) Alters the colour of water
(c) Increases pH of water
(d) Oxygen level in water gets reduced

Q13. What is the typical range of wind speed (in m/s) required for the efficient operation of most commercial wind turbines?

(a) 12 - 25 m/s
(b) 0 - 2 m/s
(c) 5 - 15 m/s
(d) 3 - 5 m/s

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Q14. If 46.4 : x :: x : 2.9, and x > 0, then find the value of x.

(a) 15.6
(b) 14.3
(c) 13.4
(d) 11.6

Q15. The areas of three adjacent faces of a solid cuboid are 190 cm^2, 285 cm^2, and 150 cm^2. Find the volume (in cm^3) of the cuboid.

(a) 2850
(b) 2716
(c) 2896
(d) 3076

Q16. A fruit vendor had some apples. He sold 40% of them and now has 840. How many apples did he originally have?

(a) 1400
(b) 1260
(c) 1800
(d) 2100

Q17. How many fundamental units are there in the SI system?

(a) 14
(b) 10
(c) 5
(d) 7

Q18. What is recommended to be done before replacing a fuse?

(a) Wear safety belt.
(b) Wear rubber gloves.
(c) to close the circuit.
(d) Standing on a stool.

Q19. 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'.

If 'M × N − P % S + T', then how is M related to T?

(a) wife's father's brother's son
(b) wife's father's brother
(c) wife's mother's brother's son
(d) wife's mother's brother

Q20. Cooking utensils have metal bodies and plastic handles because _____

(a) Both metal and plastic are good conductors of heat.
(b) Metal is a good conductor of heat and plastic is a heat insulator.
(c) Metal is a heat insulator and plastic is a good conductor of heat.
(d) Both metal and plastic are heat insulators.

Q21. The list price of an article is Rs. 5,100 and a discount of 32% 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. 1,734?

(a) 49%
(b) 46%
(c) 50%
(d) 55%

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Q22. A bulb is connected to a 10 V battery for 20 seconds. If it draws a current of 2 A, calculate the heat energy generated by the bulb.

(a) 400 J
(b) 200 J
(c) 100 J
(d) 120 J

Q23. What is the primary purpose of information kiosks set up by the government?

(a) To provide free food and beverages to citizens
(b) To offer citizens easy access to information and services such as bill payments, registrations and public information
(c) To allow citizens to participate in online gaming competitions
(d) To enable government employees to monitor social media activities of citizens

Q24. Which of the following statements are true regarding general safety in the workshop?

Statement 1: Use any available tool for the job, even if it is not the correct one.
Statement 2: Keep the tools in their proper place after use.
Statement 3: Clean the machine while it is still running.
Statement 4: Replace worn-out or damaged tools immediately.

(a) Statements 1 and 2 are true.
(b) Statements 3 and 4 are true.
(c) Statements 1 and 3 are true.
(d) Statements 2 and 4 are true.

Q25. What is the proper way to handle misunderstandings in online conversations?

(a) Publicly embarrassing the other person
(b) Block that person immediately
(c) Addressing misunderstandings politely and privately
(d) Ignoring the conversation

Q26. A man bought two varieties of apples at Rs. 4 per 5 apples and Rs. 4 per apple, respectively. If he bought an equal number of each variety of apples and then sold all the apples at Rs. 3 per apple, what would his profit percentage be?

(a) 2%
(b) 24%
(c) 25%
(d) 23%

Q27. Simplify the following expression: $(x - y - z)^2 - (x + y + z)^2$

(a) $-4x\ (y + z)$
(b) $-4z\ (x + y)$
(c) $-4y\ (x + z)$
(d) $-4\ (xy + yz + zx)$

Q28. What is the process of heat transfer in liquids?

(a) Just conduction
(b) Both conduction and radiation
(c) Convection
(d) Only radiation

Q29. In a rare coin collection, there was one gold coin for every five non-gold coins. Then, 18 more gold coins were added to the collection, after which the ratio of gold coins to nongold coins became 5 : 7. How many coins in all are now there in the collection?

(a) 55
(b) 45
(c) 75

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(d) 60

Q30. A car leaves New Delhi and goes to Agra. The distance between the two cities is 300 km. Then the car returns to New Delhi. What is the total distance and displacement covered by the car? (Assume the car returns to the same destination and the route taken for both journeys is the same.)

(a) The distance covered is 0 km and the displacement is 600 km.
(b) The distance covered is 0 km and the displacement is 0 km.
(c) The distance covered is 300 km and displacement is 0 km.
(d) The distance covered is 600 km and displacement is 0 km.

Q31. Samir can complete a task in 6 days, while Tanveer can do it in 8. If Amir joins them, the three can complete the entire task in 3 days. If the total payment for the work is Rs. 2,400, how much will Aamir receive for his contribution?

(a) Rs. 300
(b) Rs. 250
(c) Rs. 430
(d) Rs. 340

Q32. A person saves 10% of his monthly income. If his monthly income increases by 30%, he saves 20% more than before. The percentage increase in his expenditure (rounded to two decimal places) is

(a) 31.11%
(b) 24.89%
(c) 40.44%
(d) 37.33%

Q33. A, B, C, D, E, F and G are seated around a round table facing the center. G sits second to the left of E. B sits third to the right of A. C is the immediate neighbour of both E and B. D sits immediate left of G. How many people sit between E and F when counted from the right of E?

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

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

(Left)^TJ#LROY#%SU$EKQ &*£B (Right)

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

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

Q35. In the following triplet, each group of letters is related to the next group following a certain logic. Select the option from the given options that follows the same logic.

GRAND-GRNAD-DNARG

(a) INDEX–DEXIN–XDEIN
(b) NIGHT–NGHIT–THGIN
(c) FRUIT–FRIUT–TIURF
(d) MINOR–MOINR–RNOIM

Q36. A train travels from A to B at a speed of 40 km/hr and returns from B to A via the same route at a speed of 10 km/hr. Find the average speed (in km/hr) of the train during the two-way journey.

(a) 15
(b) 14
(c) 19

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(d) 16

Q37. Find the largest four-digit number which, when divided by 21, 42, 147 and 105 leaves remainders 14, 35, 140 and 98 respectively.

(a) 8019
(b) 8813
(c) 8034
(d) 8816

Q38. Statement I and Statement II are given below. These statements may be independent causes, effects of independent causes, or common causes. One statement may be an effect of the other. Read both statements carefully and choose the correct answer.

Statement:

The traffic police have issued a traffic advisory regarding traffic diversions for the next two days due to the closure of Raj Bhavan Road.

The Municipal Corporation plans to repair potholes on Raj Bhavan Road tomorrow.

(a) II is the cause and I is its possible effect.
(b) Both I and II are effects of independent causes.
(c) Both I and II are independent causes.
(d) I is the cause and II is its possible effect.

Q39. The SI unit of luminous intensity is

(a) Watt
(b) Mol
(c) Meter
(d) Candela

Q40. 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 follow(s) from the given statements.

Statements:

Some cats are rats. All bats are tables. All rats are bats.

Conclusions:

(I): Some cats are bats.

(II): All bats are rats.

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

Q41. What is the normal range of temperature for a healthy human body in Kelvin?

(a) (301.15-323.15) K
(b) (283.15-323.15) K
(c) (308.15-315.15) K
(d) (293.15-323.15) K

Q42. What should come in place of question mark (?) in the given series?

197 112 189 129 181 146 173 163?

(a) 165
(b) 153
(c) 156
(d) 144

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Q43. Study the following table and answer the given question.

	Number of mangoes sold on Monday	Number of mangoes sold on Tuesday	Wednesday
Shop X	58	19	25
Shop Y	42	34	30

If a mango was sold by shop Y for Rs. 80 on Tuesday, then how much amount did shop Y receive on Tuesday?

(a) Rs. 2,720
(b) Rs. 2,780
(c) Rs. 2,560
(d) Rs. 2,620

Q44. Which of the following options represents the equation of work done?

(a) Work done = Force / Displacement
(b) Work done = Force × Displacement
(c) Work done = Force + Displacement
(d) Work done = Force – Displacement

Q45. In which chemical process the R group of alcohol is replaced by R' group of ester to make biodiesel from vegetable oils?

(a) Fermentation
(b) Polymerisation
(c) Distillation
(d) Transesterification

Q46. The resistance of a wire is affected by which of the following factors?

(a) Length and cross-sectional area of the wire only
(b) Length, cross-sectional area and material of the wire
(c) Wire material only
(d) Wire length only

Q47. In triangle PQR, angle Q=90°. If tan R=1/2, then find the value of (sec P(3cos R-sin P))/(4csc R(4sin R-cos P)).

(a) 1/3
(b) 8/7
(c) -8/7
(d) -1/3

Q48. Which of the following letter-number cluster will come in place of the question mark (?) in the given series?

6S, 24T, 12V, 48Y, 24C, ?

(a) 60H
(b) 96I
(c) 96H
(d) 96G

Q49. A cylindrical tank of diameter 14 m contains water up to the depth of 6 m. What is the total area of wetted surface? Use($\pi = 22/7$).

(a) 414 m^2
(b) 418 m^2
(c) 416 m^2
(d) 412 m^2

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Q50. In a project involving the design of a pipeline for a building, which technical drawings would need to be referenced together?

(a) Mechanical and Electrical
(b) Civil and Electronics
(c) Mechanical and Civil
(d) Electrical and Electronics

Q51. How many folds is/are required to fold an A2 size drawing sheet (420 mm × 594 mm), according to BIS SP: 46-2003?

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

Q52. Which of the following is not a heat insulator?

(a) Rubber
(b) Silver
(c) Plastic
(d) Wool

Q53. There are four partners in a business, A, B, C, and D. A's investment is two-thirds of D's. B and C invest equal amounts, and C's investment is half of D's. If they earn Rs. 137.6 lakh at the end of one year, find the total share (in lakhs) of A and B.

(a) 62.2
(b) 63.2
(c) 59.2
(d) 60.2

Q54. If the arithmetic mean of A and B is 70 and that of B and C is 110, then what will be the value of C-A?

(a) 80
(b) 90
(c) 60
(d) 70

Q55. In a certain code language, 'GIFT' is coded as '8264' and 'FEAR' is coded as '3527'. What is the code for 'F' in the given code language?

(a) 3
(b) 2
(c) 5
(d) 6

Q56. In the following number-pairs, the second number is obtained by performing certain mathematical operations on the first number. What number should replace X and Y so that the pattern followed by the two numbers on the left side of :: sign is the same as the pattern followed by the two numbers on the right side of :: sign?

(Note: Operations must be performed on whole numbers, without breaking the number into its component digits. Take 13 for example. Operations such as addition/subtraction/multiplication by 13 can be performed on 13. Breaking 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed.)

X : 179 :: 22 : Y

(a) X = 16, Y = 222
(b) X = 15, Y = 223
(c) X = 16, Y = 219
(d) X = 18, Y = 219

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Q57. 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. F lives on an even-numbered floor, but not on floor number 6. The sum of the floors on which D and F live is 9. The sum of the floors on which F and B live is 5. E lives on the floor immediately below C. How many people live between D and E?

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

Q58. Which of the following correctly identifies the main components of a standard email structure?

(a) Subject Line, Recipient Address, Message Body and Signature
(b) Recipient Address, CC, BCC and Attachment
(c) Header, Body, Footer and Encryption Key
(d) Username, Password, Message Body and Signature

Q59. Automobile A travels a distance in 2 hours at a speed of 42 km/hr. Automobile B travels twice the distance traveled by A in 5 hours. Find the speed (in km/hr) of Automobile B.

(a) 31.2
(b) 34.2
(c) 36.3
(d) 33.6

Q60. Find the smallest number which when divided by 5, 6 and 7 leaves remainders 4, 5 and 6.

(a) 208
(b) 207
(c) 209
(d) 210

Q61. 5 men or 9 women can do a piece of work in 9 days. 5 men work for 7 days and then leave. Find the number of women needed to complete the remaining work in 9 days.

(a) 4
(b) 2
(c) 1
(d) 5

Q62. Which of the following statements is correct?

(a) The resistance increases as the length of the conductor increases.
(b) The resistance decreases as the length of the conductor increases.
(c) The resistance increases as the thickness of the conductor increases.
(d) The resistance remains unchanged on increasing the length of the conductor.

Q63. The length of a rectangular sheet is 15.2 cm ± 0.1 cm and the width is 9.11 cm ± 0.1 * cm / 1, then what is the error in estimating the area of the rectangular sheet?

(a) 0.3 cm^2
(b) 13 cm^2
(c) 5 cm^2
(d) 2 cm^2

Q64. What is the most effective way to avoid mechanical hazards when operating large and dangerous machinery?

(a) Appropriate training and experience
(b) Regular machine maintenance only
(c) Employee-only physical fitness training
(d) Redesigning the machine to eliminate hazards

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Q65. If the ball is thrown upwards, then the work done by the force of gravity on the ball is:

(a) Negative
(b) Independent of the displacement of the ball
(c) Positive
(d) Zero

Q66. Rita invests a certain sum of money at a certain rate of simple interest per annum, and the interest she receives is equal to one-fourth of the invested amount. If the time period of investment (in years) is equal to the rate of interest per annum, then for how many years did Rita invest the money?

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

Q67. Which of the following fundamental quantities are used to express any mechanical quantity?

(a) Length, mass and time
(b) Mass, time and force
(c) Length, time and energy
(d) Length, mass and speed

Q68. A product with an MRP of Rs. 1,590 is sold by a wholesaler for Rs. 835. Find the percentage discount offered (rounded off to the nearest integer).

(a) 46%
(b) 47%
(c) 45%
(d) 49%

Q69. Find the value of 32 - 4 [4 + 5 (4 - 4 (6 - 2) + 4) - 18] ÷ 6.

(a) 60
(b) 56
(c) 68
(d) 58

Q70. The value of 60% of 45 is how much more than 4/5 of 25?

(a) 1
(b) 5
(c) 4
(d) 7

Q71. What is the first step in providing first aid for a minor burn?

(a) Cover the burned area with a thick cloth
(b) Pour cold water on the burned area
(c) Burst any blisters that form
(d) Apply butter to the burned area

Q72. The resistivity of a conductor depends on _____.

(a) Cross-sectional area
(b) Matter
(c) Length of conductor
(d) Potential difference across the ends of the conductor

Q73. Which ICT (Information and Communication Technology) service is commonly used for activities like railway reservation in e-governance?

(a) Online payment gateway
(b) Social media platform

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(c) Email Services
(d) Web portal

Q74. Find the energy of a 5 kg object at a height of 8 m above the ground. Let the value of 'g' be 9.8 m s^2.
(a) 392 J
(b) 784 J
(c) 300 J
(d) 400 J

Q75. Three of the following four letter-clusters are alike in a certain way based on the English alphabetical order and hence form a group. Which letter-cluster does not belong to that group? (Note: The odd letter-cluster is not based on the number of consonants/vowels or their position.)
(a) NQIL
(b) BEWZ
(c) RUNP
(d) WZRU

Q76. Which of the following statements is correct?
(a) Laboratory thermometers are used to measure the temperature of the human body.
(b) There is no method to convert temperature from one heat scale to another.
(c) The normal human body temperature is 45°C.
(d) The normal human body temperature is 98.6°F.

Q77. An 8 Ω resistor generates 200 J of heat per second. Find the potential difference across the resistor.
(a) 10 V
(b) 30 V
(c) 40 V
(d) 20 V

Q78. Which of the following is commonly used for the treatment of drinking water?
(a) Acid neutralization
(b) Chlorination
(c) Incineration
(d) Oil Filtration

Q79. In the following series, only one letter-cluster is wrong. Choose the wrong letter-cluster.
INK KPJ MRI OTH QWG SXF
(a) MRI
(b) QWG
(c) SXF
(d) OTH

Q80. If '+' and '-' are interchanged and '×' and '÷' are interchanged, then what will come in place of question mark (?) in the following equation?
9 ÷ 5 + 70 × 7 − 11 = ?
(a) 46
(b) 47
(c) 44
(d) 45

Q81. Neha swims in a pool that is 50 metres long. She covers 100 metres in 1 minute by swimming from one end of the pool to the other and back along the same straight path. Find her average velocity (in m/s).
(a) 3.2 m/s
(b) 1.7 m/s
(c) 2.5 m/s

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(d) 0 m/s

Q82. Which of the following letter-clusters should be replaced by # and % so that the pattern and relation followed between the letter-cluster pair on the left side of :: sign is the same as the pattern and relation followed between the letter-cluster pair on the right side of :: sign?

: EAG :: IEK : %

(a) = FBH, % = HDI
(b) = FBH, % = HDJ
(c) = FBG, % = HDJ
(d) = FBH, % = HEJ

Q83. Which of the following statements are true regarding electrical safety practices?

1. It is safe to plug multi-outlet bars into other multi-outlet bars as long as the total load does not exceed the rated capacity of the outlet.

2. Electrical appliances should not be used near damp surfaces or when your hands are wet, and electrical cords should be protected by not placing them under rugs or mats.

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

Q84. The resistance of a uniform metallic conductor depends on its:

(a) length only
(b) length, area of cross-section, and nature of its material
(c) melting point only
(d) area of cross-section only

Q85. The sum of _____ is mechanical energy.

(a) Potential energy and kinetic energy
(b) Electrical energy and light energy
(c) Thermal energy and chemical energy
(d) Chemical energy and electrical energy

Q86. Refer to the following letter and symbol series and answer the question that follows.

Counting to be done from left to right only.

(Left) ^TJ#LROY#E%SU$KQ&*£B (Right)

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

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

Q87. Select the option that is true regarding the following two statements labelled Assertion (A) and Reason (R).

Assertion (A): It is safe to work under a suspended load if you are in a hurry.

Reason (R): Never exceed the safe working load (SWL) of the equipment you are using.

(a) Both (A) and (R) are true, and (R) is the correct explanation of (A).
(b) Both (A) and (R) are true, but (R) is not the correct explanation of (A).
(c) Assertion (A) is false, but Reason (R) is true
(d) Assertion (A) is true, but Reason (R) is false.

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Q88. What is a rheostat used for in an electrical circuit?

(a) To change the resistance in a circuit
(b) To measure current only
(c) To measure voltage only
(d) To measure both current and voltage

Q89. A, B, C, D, E, F, and G are seated around a round table facing the center. Only two people sit between G and C, when counted from the left of C. F sits third to the left of E. B sits to the immediate right of E. B sits second to the left of G. D is an immediate neighbor of F. How many people sit between A and C, when counted from the right of C?

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

Q90. In a certain code language, 'while you wait' is coded as 'ns bg sp' and 'why 1 wait now' is coded as 'kc rw bg'. How will 'wait' be coded in the given language?

(a) ns
(b) kc
(c) bg
(d) sp

Q91. The dimension of surface tension is _____.

(a) $ML^2T^{(-2)}$
(b) ML^0T ^(-2)
(c) MLT ^(-2)
(d) ML^0T

Q92. Find the kinetic energy of a body of mass 10 kg moving with a uniform velocity of 5ms^(-1).

(a) 120 J
(b) 125 J
(c) 50 J
(d) 25 J

Q93. I, J, K, L, U, V and W each have their exam on a different day of the week, starting from Monday and ending on Sunday of the same week. Only two people have their exam before V. Only one person has an exam after L. Only three people have an exam between V and I. Only one person has an exam between J and K. W has an exam just before J. Who among the following has an exam on Friday?

(a) W
(b) U
(c) I
(d) V

Q94. What should come in place of question mark (?) in the given series?

67 106 88 127 109 148?

(a) 130
(b) 126
(c) 117
(d) 108

Q95. Which of the following materials serves as a heat insulator?

(a) Aluminium
(b) Silver
(c) Plastic
(d) Copper

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Q96. Which of the following units is used to measure only basic physical quantities?

(a) Derived unit
(b) Basic unit
(c) Neither basic nor derived units
(d) Both basic and derived units

Q97. Which of the following terms describes the process of the gradual increase in the average temperature of the Earth's atmosphere, due to the greenhouse effect caused by increased levels of carbon dioxide, CFCs and other pollutants?

(a) Acid rain
(b) Global warming
(c) Ozone depletion
(d) Deforestation

Q98. Two sets of numbers are given below. In each set, performing certain mathematical operations on the first number gives the second number. Similarly, by performing certain mathematical operations on the second number, the third number is obtained 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 number into its component digits. Take 13 for example. Operations such as addition/subtraction/multiplication by 13 can be performed on 13. Breaking 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed.)

68-136-121-363;

29-58-43-129

(a) 35 – 70 – 55 – 165
(b) 42 – 84 – 74 – 222
(c) 13 – 26 – 46 – 138
(d) 73 – 146 – 114 – 228

Q99. The measures of two supplementary angles are in the ratio 3 : 7. Find the measure of the greater of the two angles.

(a) 180°
(b) 54°
(c) 144°
(d) 126°

Q100. The sum of the ages of a grandfather, his son, and his grandson is 128 years. The grandfather is twice as old as his son, and the son is five times his grandson. Find the grandson's age (in years).

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

PART B

Q101. In India, when was the Hazardous Waste (Management and Handling) Rules implemented to regulate the disposal and processing of hazardous waste?

(a) 1987
(b) 2000
(c) 1989
(d) 1982

Q102. A triple-riveted butt joint with two cover-straps is used for the _____.

(a) circumferential joint
(b) radial joint
(c) angle joint
(d) longitudinal joint

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Q103. In screw gauge, the term 'lead of a screw' is defined by the:

(a) material the screw is made of
(b) number of threads on the screw
(c) diameter of the screw
(d) distance the screw moves axially with one complete turn

Q104. Which of the following factors influences the self-dressing ability of a honing stone?

(a) Abrasive grain size and hardness
(b) Workpiece surface roughness
(c) Depth of cut per stroke
(d) Honing tool reciprocating speed

Q105. Which feature of a pipe wrench allows it to grip a round pipe securely?

(a) Serrated jaws with adjustable hook
(b) A built-in ratchet mechanism
(c) Smooth jaws
(d) Fixed jaws with a rubber grip

Q106. Which of the following parts of a hammer-head is used for shaping and forming work like riveting and bending?

(a) Face
(b) Pein
(c) Eyehole
(d) Cheek

Q107. What is the main reason copper turns green over time?

(a) Hydrogen embrittlement
(b) Absorption of nitrogen from the air
(c) Reaction with UV light
(d) Formation of an oxide layer

Q108. What is the primary advantage of rutile electrodes in welding?

(a) They are suitable for welding high-carbon steels.
(b) They provide good weld shape and easy slag removal.
(c) They produce deep penetration for high-strength welding
(d) They generate minimal heat during the welding process.

Q109. An appliance operates at 240 V and consumes 480 W of electrical power. What is the current flowing through the appliance?

(a) 2 A
(b) 1.5 A
(c) 1 A
(d) 2.5 A

Q110. Which of the following is NOT a correct practice when using a telescopic gauge?

(a) Measuring at multiple points for accuracy
(b) Using a micrometer to measure the gauge's expanded size
(c) Measuring a rough or dirty bore without cleaning it
(d) Locking the gauge before removing it from the bore

Q111. The property of _____ is important, while repairing a machine, if a broken part is to be replaced, we need a new part. Only if the new part is made of accurately similar measurement, it can be fitted, otherwise not.

(a) allowance
(b) tolerance
(c) interchangeability
(d) interference

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Q112. If the linear expansion coefficient of a material is 2 × 10^(-5)° C^(-1) what does it mean?

(a) When the temperature increases by 1° C, the material always increases by 2 × 10^(-5)
(b) Per degree Celsius, the material expands in volume by 2 × 10^(-5) times its original volume.
(c) Per degree Celsius, the material expands in length by 2 × 10^(-5) times its original length.
(d) Per degree Celsius, the material expands in area by 2 × 10^(-5) times its original area.

Q113. In industrial color coding, what does the red color usually indicate?

(a) Neutral area
(b) Safety equipment or emergency stop
(c) Electrical grounding
(d) Low-pressure pipes

Q114. Which of the following belts is acid proof and water proof and is NOT affected by animal oils or alkalies?

(a) Balata belts
(b) Rubber belts
(c) Cotton or fabric belts
(d) Leather belts

Q115. In which maintenance strategy is section inspection considered an important component?

(a) Run-to-failure maintenance
(b) Predictive maintenance - PdM
(c) Preventive maintenance - PM
(d) Corrective maintenance

Q116. In resistance soldering, how is heat generated?

(a) By ultrasonic waves
(b) By resistance to electrical current
(c) By an electric arc
(d) By direct flame

Q117. A body of mass 500 g is at rest. What force (approx.) is required to push it so that its final velocity becomes 20 m/s after covering a distance of 20 m? Assume there is no friction and take g = 10 m/s².

(a) 5 J
(b) 10 J
(c) 10 N
(d) 5 N

Q118. What is the chemical effect that occurs inside a lead acid battery during the charging process?

(a) Water decomposes into hydrogen and oxygen.
(b) Lead sulfate decomposes into lead and sulfuric acid.
(c) Sulfuric acid decomposes into hydrogen and sulfate ions.
(d) Lead reacts with acid and forms lead sulfate.

Q119. How is the principle of hydraulic systems used in amusement parks?

(a) By cooling mechanical components
(b) By controlling air brakes in a swing ride
(c) By lowering riders in drop towers and air-driven rides
(d) By providing power to hydraulic roller coasters

Q120. Key way on a shaft is made with a _____ chisel

(a) cross cut
(b) round nose
(c) flat
(d) side cut

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Q121. In engineering drawing (lettering and numbering), a single stroke means that the _____.

(a) thickness of the line of the letter or number is obtained in two strokes of the pencil
(b) thickness of the line of the letter or number is obtained in one stroke of the pencil
(c) thickness of the line of the letter or number is obtained in no strokes of the pencil
(d) thickness of the line of the letter or number is obtained in three strokes of the pencil

Q122. What is the coating factor range for medium-coated electrodes?

(a) 1.6 to 2.2
(b) 1.1 to 1.2
(c) 1.25 to 1.3
(d) 1.4 to 1.5

Q123. Which of the following is a fundamental unit?

(a) metre
(b) newton
(c) pascal
(d) watt

Q124. In the limit system, the distinction between allowance and deviation is:

(a) allowance is used for single parts, while deviation is used for assemblies
(b) allowance is the difference between the maximum material limits of the mating parts, while deviation is the difference between a size and the corresponding basic size
(c) allowance is always positive, while deviation can be positive or negative
(d) allowance is the difference between a size and the corresponding basic size, while deviation is the difference between the maximum material limits of the mating parts

Q125. Why should the blade of a bevel gauge be wiped clean after use?

(a) To make it look new in appearance
(b) To prevent rust and maintain accuracy
(c) To make it a multipurpose tool/gauge
(d) To ensure it remains flexible to use

Q126. What is the blade length of the T1 'T' square, as per IS:1360-1989?

(a) 1000 mm
(b) 500 mm
(c) 1500 mm
(d) 700 mm

Q127. The principle behind the vernier scale in a vernier caliper is:

(a) dividing a known length into a certain number of equal divisions
(b) adding the main scale and auxiliary scale readings
(c) subtracting the vernier scale reading from the main scale reading
(d) multiplying the main scale reading

Q128. Which of the following is the key difference between a fuse and a circuit breaker?

(a) A fuse is used for high-voltage circuits, while a circuit breaker is used for low-voltage circuits.
(b) A fuse is a one-time-use device, while a circuit breaker can be reset and reused.
(c) A fuse can be reset after tripping, while a circuit breaker must be replaced.
(d) A fuse is a mechanical device, while a circuit breaker is an electronic device.

Q129. Which of the following statements is correct about a protractor?

Statements:

1. A protractor can be used to measure angles from both sides.
2. A protractor is typically made of a rigid metal material.

(a) Both statements are true

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(b) Neither statement is true
(c) Only statement 1 is true
(d) Only statement 2 is true

Q130. If the efficiency of a machine is 80%, what does it mean?
(a) The machine gives more output than the input.
(b) There is no loss of input energy in the machine.
(c) Both the velocity ratio and the mechanical advantage of the machine are equal to 80.
(d) There is a 20% loss of input energy in the machine.

Q131. When the size of a shaft is less and the size of the hole is more, the difference between the two is called _____.
(a) interference
(b) clearance
(c) tolerance
(d) deviation

Q132. When the size of the hole or female part of a job is more than shaft or male part, the difference between the two will be known as _____.
(a) negative allowance
(b) positive allowance
(c) neither positive nor negative allowance
(d) either positive or negative allowance

Q133. Match the correct length and width of the trimmed sizes of sheets.

Designation	Trimmed size
A. AO	P. 297 x 420
B. Al	Q. 420 x 594
C.A2	R. 594 x 841
D. A3	S. 841 x 1189

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

Q134. Which of the following statements correctly describes the placement and purpose of orientation marks on a drawing sheet?

1. Orientation marks are placed at two opposite corners of the drawing sheet to indicate the correct orientation on the drawing board.

2. Orientation marks consist of arrow heads placed across the frame, with one at the shorter side and one at the longer side, coinciding with the centering marks.

3. One of the orientation marks always points towards the draughtsman, indicating the direction in which the drawing sheet should be placed.

4. Orientation marks are used to mark the midpoint of each side of the drawing sheet for accurate centering.

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

Q135. Identify the correct combination of a rivet parts.
(a) Anvil, stock, top fuller
(b) Bottom fuller, shank, horn
(c) Hardie hole, chipping block, pritchel hole

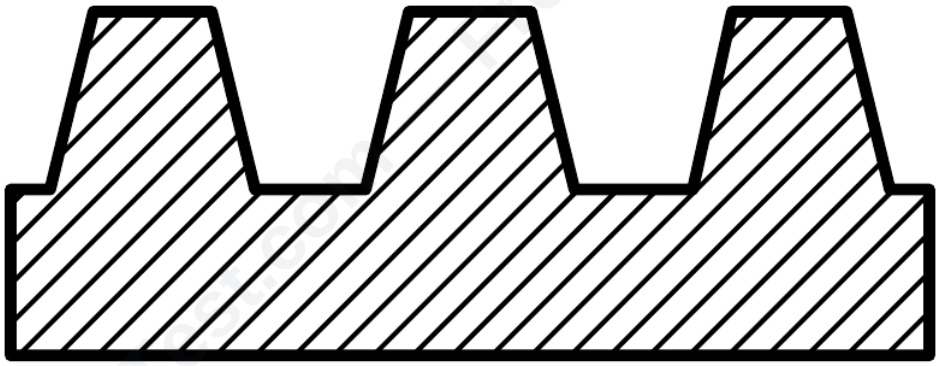
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(d) Head, cylindrical body of shank, a slightly tapered tail

Q136. A _____ chisel is used for making an oil groove in a bearing and for cutting slits at corners.

(a) flat
(b) round nose
(c) side cut
(d) cross cut

Q137. Identify the type of thread shown below.



(a) Acme thread
(b) Knuckle thread
(c) V-thread
(d) Square thread

Q138. In multiple start threads, which of the following correctly represents the relationship between lead and pitch?

(a) Lead equals the pitch.
(b) Lead is greater than the pitch.
(c) There is no relationship between them.
(d) Lead is less than the pitch.

Q139. Tapping is the operation of _____.

(a) cutting internal threads in a hole
(b) sizing and improving the geometry and finish of a previously drilled hole
(c) machining flat surfaces on work pieces
(d) providing tapered entrance to the hole

Q140. What is the primary principle behind the generation of electrical energy in a piezoelectric device?

(a) Conversion of chemical energy into electrical energy
(b) Conversion of mechanical stress into electrical energy
(c) Conversion of thermal energy into electrical energy
(d) Conversion of light energy into electrical energy

Q141. What is the effect of the heat treatment process 'annealing' on steel?

(a) Softens the material and increases toughness
(b) Produces martensite
(c) Reduces ductility
(d) Increases hardness and strength

Q142. Which of the following statements is/are correct?

Statement I - The annealing process uses heat to reduce the hardness and increase the ductility and toughness of various steels, cast iron, and alloys.

Statement II - Quenching is a rapid cooling process that alters specific properties of materials by manipulating the cooling rate.

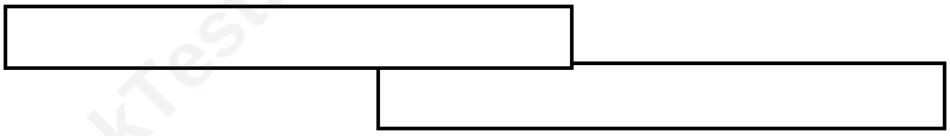
(a) Statement (I) and (II) both are incorrect

(b) Statement (I) is correct but Statement (II) is incorrect.
(c) Statement (I) and (II) both are correct.
(d) Statement (I) is incorrect but Statement (II) is correct.

Q143. In engineering drawing, what is defined as the path of a moving point with no thickness?
(a) Line
(b) Angle
(c) Curve
(d) Point

Q144. Which of the following microstructural changes occurs during the tempering of martensite?
(a) Ferrite transforms into pearlite.
(b) Martensite transforms into pearlite.
(c) Martensite decomposes into ferrite and cementite.
(d) Austenite transforms into martensite.

Q145. Identify the type of brazed joint shown below.



(a) Simple Lap
(b) Butted Flange
(c) Strapped Lap
(d) Joggle Lap

Q146. Which tool can be used along with a radius gauge to check curvature of a workpiece for better accuracy?
(a) Surface plate
(b) Bevel protractor
(c) Feeler gauge
(d) Micrometer

Q147. Which punch mark among the following is used for precise positioning and safety of the dividing point?
(a) Center punch mark of 30°
(b) Center punch mark of 60°
(c) Prick punch mark of 30°
(d) Prick punch mark of 120°

Q148. Which of the following is an example of a p-type semiconductor?
(a) Silicon doped with phosphorus
(b) Silicon doped with boron
(c) Germanium doped with phosphorus
(d) Silicon doped with arsenic

Q149. What does an optical pyrometer measure?
(a) Pressure of gases
(b) Volume of liquids
(c) Temperature of a surface
(d) Relative density of liquids

Q150. Which of the following frosting techniques is best suited for large industrial components?
(a) File finishing
(b) Hand scraping
(c) Sandblasting
(d) Electrochemical frosting

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Q151. Which control valve is commonly used to control pressure in multiple actuators operating in sequence?

(a) Pressure reducing valve
(b) Check valve
(c) Pressure sequence valve
(d) Pressure relief valve

Q152. The included angle of the tip of a standard lathe centre is _____.

(a) 90°
(b) 60°
(c) 30°
(d) 45°

Q153. Which of the following statements related to the use of wire gauge is incorrect?

(a) It measures the diameter of a wire.
(b) The use of an incorrect wire gauge may damage devices and electronic circuits.
(c) It does not help in determining the current-carrying capacity of a wire.
(d) It is used in electrical installations, wiring, and other applications.

Q154. Which of the following types of wooden mallets are used for general purpose work such as flattening and bending?

(a) Side-faked mallets
(b) Standard wooden mallets
(c) Bossing mallets
(d) End-faked malles

Q155. Which of the following is the Outer operation of the lathe?

(a) Tapping
(b) Facing
(c) Drilling
(d) Boring

Q156. Which of the following is a key advantage of using Thyristors in power control applications?

(a) Small size and low cost
(b) Low voltage handling capabilities
(c) High frequency switching
(d) High efficiency and low power loss

Q157. Which of the following is an advantage of chain drives over belt drives?

(a) The chain drive needs accurate mounting and careful maintenance, particularly lubrication and slack adjustment.
(b) It gives a high transmission efficiency.
(c) The chain drive has velocity fluctuations especially when unduly stretched.
(d) The production cost of chains is relatively high.

Q158. Which type of cooling method is used in the annealing process?

(a) Air cooling
(b) Furnace cooling
(c) Water quenching
(d) Oil quenching

Q159. Which of the following non-metals is naturally black?

(a) Alumina
(b) Silicon
(c) Quartz
(d) Graphite

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Q160. _____ is a metal removal process that employs an abrasive grinding wheel (GW) whose cutting elements are grains of abrasive materials of high hardness and high refractoriness.

(a) Boring
(b) Taper turning
(c) Step turning
(d) Grinding

Q161. What is the purpose of using a wiper die in rotary draw bending?

(a) To cut the pipe after bending
(b) To reduce wrinkling on the inner surface of the bend
(c) To apply heat for easy bending
(d) To measure the bending angle

Q162. What does a green sign with a white cross indicate in a maintenance environment?

(a) Prohibited area
(b) Flammable materials storage
(c) First aid station
(d) High voltage zone

Q163. Which of the following shafts is an example of a machine shaft?

(a) Line shaft
(b) Overhead shaft
(c) Counter shaft
(d) Crank shaft

Q164. Why is it important to follow proper disposal procedures for industrial waste?

(a) To save time and effort in sorting waste
(b) To reduce the number of trash bins needed
(c) To comply with environmental regulations and reduce pollution
(d) To allow waste to decompose anywhere

Q165. The 'merit number' in toughness measurement is used for:

(a) comparing different materials
(b) determining a material's density
(c) measuring a material's elasticity
(d) finding the modulus of rigidity

Q166. What type of abrasive is typically used for honing a hard material like ceramic?

(a) Diamond
(b) Copper tool
(c) Steel wool
(d) Sandpaper

Q167. What is waste?

(a) Valuable substances for agriculture
(b) Useful materials for industries
(c) Natural resources for living organisms
(d) Unwanted or unusable materials

Q168. The digital interface of an electronic digital caliper improves the reliability of measurement records by:

(a) providing secured storage for a series of readings
(b) eliminating the need for manual data entry
(c) allowing direct connection to a statistical control system
(d) enabling the instrument to be used as a limit gauge

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Q169. _____ are used to hold previously drilled or bored holes for outer surface machining.

(a) Carriages
(b) Lathe carriers
(c) Rests
(d) Lathe mandrels

Q170. Which of the following types of wooden mallets are used for hollowing panel beatings?

(a) End-faked mallets
(b) Side-faked mallets
(c) Standard wooden mallets
(d) Bossing mallets

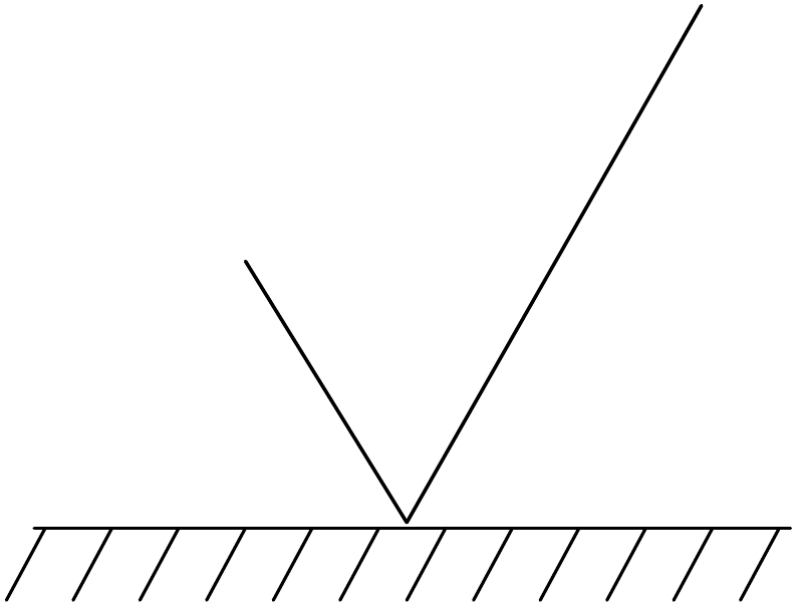
Q171. Which of the following punches is used to make deeper witness marks on scribed lines and make it easier for the drill to start correctly?

(a) Solid punch
(b) Prick punch
(c) Pin punch
(d) Centre punch

Q172. Pencils are rated in engineering drawings based on the _____.

(a) durability of the lead
(b) colour of the lead
(c) hardness or softness of the lead
(d) shape of the lead

Q173. What does the surface finish symbol shown in the given figure represent?



(a) Material removal is strictly prohibited
(b) The surface must be left without machining
(c) The surface requires a specific finishing process
(d) A general machining indication without roughness details

Q174. When drawing a curved line of a specific length in an engineering drawing, which tool is most appropriate for ensuring accuracy?

(a) Protractor
(b) Compass
(c) Straightedge
(d) French Curve

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Q175. Which type of rotary actuator provides limited angular movement instead of continuous rotation?

(a) Rack and pinion rotary actuator
(b) Hydraulic motor
(c) Vane motor
(d) Pneumatic actuator

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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