RRB ALP CBT-II (Heat Engine) 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'.

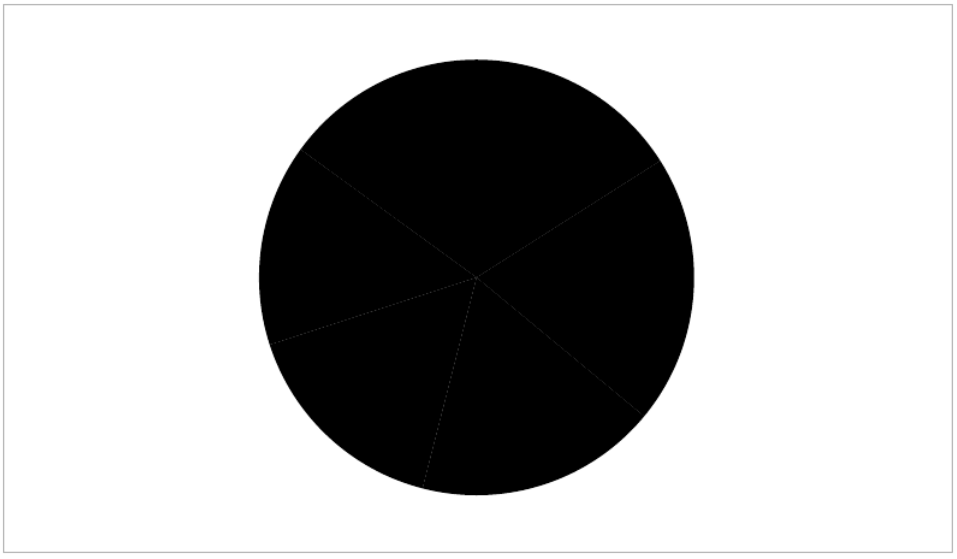
(a) The thickness of the line of a letter
(b) A continuous thick or wide line along which the prints are trimmed
(c) A line that is drawn to make a section evident
(d) A numerical value expressed in an appropriate unit of measurement

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.



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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 m² is Rs. 11,000, then find the volume of the hall.

(a) 15,125 m³
(b) 19,200 m³
(c) 19,520 m³
(d) 18,250 m³

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. Why do cars have treaded tyres?

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

Q102. Which of the following processes is carried out on connecting rods to locate the two halves relative to one another?

(a) Tapper threads are used
(b) Mirror finishing is done by diamond turning machine
(c) Dimples are created on the surface
(d) Serrations are used

Q103. Which of the following stages of an automatic transmission system locks the transmission, restricting a vehicle from moving?

(a) Park (P) stage
(b) Low (L) stage
(c) Drive (D) stage
(d) Neutral (N) stage

Q104. The SI unit of 'ultimate stress' is _____.

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

Q105. Sine bars are used when a high degree of accuracy less than _____ is needed for measuring angles.

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

Q106. Which of the following conversions are correct?

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

Q107. Which of the following is a key electrical safety tip in a workshop?

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

Q108. 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) Only statement 1 is true
(c) Both statements are true
(d) Only statement 2 is true

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Q109. Which of the following processes is used to fit a bearing into the connecting rod, allowing the gudgeon pin to provide the oscillating movement at the small end of the connecting rod?

(a) Press fit
(b) Loose fit
(c) Autofrettage fit
(d) Interference fit

Q110. Which of the following statements is NOT correct about the parts associated with the cylinder head?

(a) The fuel injector is used to spray fuel into the engine cylinder. It is fixed to the cylinder head.
(b) The combustion of fuel and the consequent release of thermal energy results in the building up of pressure in the casing.
(c) Through the metal screw the spark plug is fitted in the cylinder head plug
(d) Space enclosed between the cylinder head and piston top during combustion is the combustion chamber.

Q111. How many divisions are there on a vernier scale as used in a modern vernier caliper for metric measurement?

(a) 50
(b) 25
(c) 75
(d) 100

Q112. The clutch slave cylinder disengages the clutch from the engine by moving the:

(a) spline shaft
(b) cushion spring
(c) leaf spring
(d) pressure plate

Q113. Which option shows the correct answer when 27°C is converted to the kelvin scale?

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

Q114. A 100-mm centre-punch could have a 10-mm diameter body and a 6-mm diameter point ground to an angle of _____.

(a) 120°
(b) 60°
(c) 30°
(d) 90°

Q115. In a two stroke petrol engine, during the upward stroke of the piston, the gases are compressed in the piston, and at the same time, which of the following is also performed during the operation?

(a) Exhaust gases enter the crank chamber through the valve.
(b) Fresh air and fuel (petrol) mixture enters the crank chamber through the valve.
(c) Fresh fuel enters in the cylinder from the crank chamber through the valve.
(d) Fresh air for petrol engine enters the cylinder from the chamber through the valve exhaust port.

Q116. Which of the following statements is NOT correct about the procedure of calculating balancing of crankshaft of an engine?

(a) To balance a crankshaft, metal can be removed by drilling holes on the 'heavy' side until balance is achieved.
(b) Crankshaft balancing involves calculating the rotating and reciprocating masses of a crankshaft.
(c) To balance a crankshaft, metal can be added by welding material deposition on the 'heavy' side until balance is achieved.
(d) It involves determining the balancing couple and counterweight mass required to balance the crankshaft.

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Q117. For which of the following calipers, a screw and nut are provided for opening and closing the caliper legs?

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

Q118. The process of aligning a principal inertia axis with the geometric axis of rotation of the shaft through the addition or removal of material in a shaft is known as:

(a) parallel alignment
(b) equilibrium
(c) angular alignment
(d) balancing

Q119. Which of the following components is a part of a diesel engine only?

(a) Carburetor
(b) Spark plug
(c) Spray nozzle
(d) Fuel tank

Q120. _____ is a type of single thin sheet of metal that yields when pressure is applied and is widely used in most modern cars. When pressure is removed, the metal springs back to its original shape.

(a) Cushion spring
(b) Diaphragm spring
(c) Leaf spring
(d) Spiral spring

Q121. Which of the following materials is used as a binding agent in organic brake linings?

(a) Rubber
(b) Cotton
(c) Metal powder
(d) Resin

Q122. 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) Preparing reports on emergency incidents
(c) Conducting routine safety checks
(d) Rescuing persons in immediate danger

Q123. What is the primary purpose of shielding in electrical cables?

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

Q124. 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-Q ; B-R ; C-S ; D-P
(b) A-S ; B-P ; C-Q ; D-R

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

Q125. What is the primary reason for the heating effect in a conductor when an electric current passes through it?
(a) The movement of protons causes heat generation.
(b) The electric field in the conductor causes heat generation.
(c) The movement of electrons causes heat generation.
(d) The conductor absorbs heat from the surrounding environment.

Q126. Compared to the metals being joined, the melting point of solder is _____.
(a) unpredictable
(b) higher
(c) lower
(d) equal (the same)

Q127. Which of the following gases is primarily liberated during oxidation of the weld pool in oxy-acetylene welding?
(a) Hydrogen
(b) Carbon dioxide
(c) Carbon monoxide
(d) Nitrogen

Q128. The accuracy of the dial bore gauge instrument depends on which of the following parts?
(a) A pointer on a graduated dial
(b) A dot indicator on a linear scale
(c) A marking on a logarithmic dial
(d) An arrow on a semi-circular scale

Q129. Which of the following is a major risk associated with fuel spillage?
(a) Increased productivity
(b) Better lubrication for workshop floors
(c) Fire hazards and environmental contamination
(d) Reduced need for ventilation

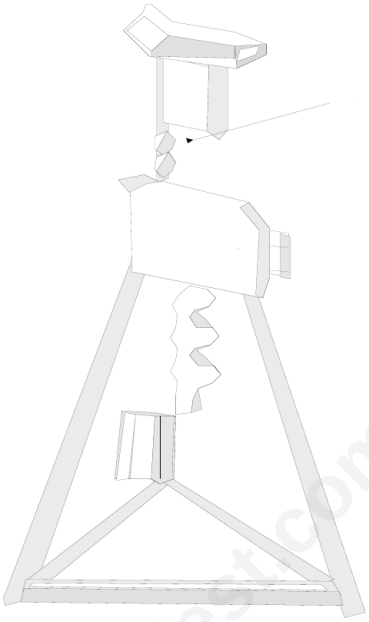
Q130. What is the primary goal of the 5S concept?
(a) To improve workplace organisation and efficiency
(b) To increase the number of safety regulations
(c) To replace traditional safety measures
(d) To eliminate the need for maintenance

Q131. In contexts such as automotive clutches, the spring is used to absorb shock during engagement. It is often referred to as a:
(a) tensile spring in helical shape
(b) spiral spring of rectangular shape
(c) cushion spring in flat shape
(d) leaf spring of circular shape

Q132. What happens if the O-ring seal is damaged?
(a) Oil may seep into the brake drum, reducing braking efficiency.
(b) The wheel bearings may stop rotating.
(c) The brake pedal may become harder to press.
(d) The vehicle's suspension may fail.

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Q133. In the given diagram of an adjustable jack stand, what is the name of the part marked as 'X'?



(a) Outlet valve
(b) Ratchet handle
(c) Ratchet teeth
(d) Saddle

Q134. When the crank is at the dead centre, what will be the magnitude of bending moment and twisting moment at the crankshaft?

(a) Both bending moment and twisting moment on the shaft are maximum
(b) Both bending moment and the twisting moment are zero in the shaft
(c) Bending moment on the shaft is maximum and the twisting moment is zero.
(d) Bending moment on the shaft is minimum and the twisting moment is maximum.

Q135. The distance between the parts to be joined in a weld is known as _____.

(a) reinforcement
(b) fusion penetration
(c) leg length
(d) root gap

Q136. Which of the following types of materials is NOT used in an oil filter as a strainer?

(a) Cloth
(b) Wire screen
(c) Felt
(d) Thin aluminum foil

Q137. Which of the statements is correct about a compression ignition engine?

(a) Operating speed range is less compared to petrol engine
(b) Diesel engine produces less noise compared to petrol engine.
(c) Starting is easy for diesel engine since less cranking effort is required compared to petrol engine.
(d) Initial and maintenance costs of diesel engine is less compared to petrol engine

Q138. 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) Undefined
(b) The output will depend on the type of gate used
(c) 0
(d) 1

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Q139. A rectangular floor measuring 10 m × 8 m is to be tiled. If each tile covers 0.25 m², how many tiles are needed?

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

Q140. Which of the following components in the axle is the most likely to fail if there is an unusual loud clanking or clunking as you put your vehicle into gear, or if a vehicle seems to struggle to get power as it starts to move?

(a) Bearing at the wheel is damaged
(b) There is a crack initiated in the axle at cross sectional area perpendicular to axis
(c) Bending in the shaft induced
(d) Axle-joint damage

Q141. 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 does not logically follow from the statement.
(c) The conclusion logically follows from the statement.
(d) The conclusion is partially supported by the statement.

Q142. Which of the following statements is NOT correct about the functions of a lube oil pump?

(a) Provides direction for the oil's passage through the galleries and to various areas.
(b) Oil is transferred to the engine's key components under high pressure,.
(c) Maintains consistent oil circulation throughout the engine.
(d) The movement of engine lubricant around the engine is made difficult

Q143. The primary function of a blowpipe in Oxy acetylene welding is to:

(a) regulate gas pressure
(b) carry gas from the regulator
(c) protect against flashback
(d) control and mix oxygen and acetylene gases

Q144. 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 test how fast the vehicle can go
(d) To ensure the vehicle is functioning safely and correctly

Q145. Which of the following is a primary difference between a primary and a secondary electrochemical cell?

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

Q146. Which of the following indicates that the fuel system is free of air during bleeding?

(a) Air bubbles stop escaping with fuel
(b) Bleeding screw tightens automatically
(c) Engine runs smoothly
(d) Fuel stops flowing

Q147. Which of the following terms is associated with the cams that control the valves and directly influence the breathing process of the engine?

(a) Location and length of the cams
(b) Shape and timing of the cams

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(c) Material of construction of the cams
(d) Speed of the cams

Q148. What is a major disadvantage of an over-inflated tyre?
(a) Wears out faster at the centre
(b) Increases road grip
(c) Improves shock absorption
(d) Reduces rolling resistance

Q149. 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 fluctuate depending on the resistor value.
(b) The output voltage will remain constant.
(c) The output voltage will decrease.
(d) The output voltage will increase.

Q150. Which of the following care and maintenance of a marking table is INCORRECT?
(a) The marking table should be protected from rust.
(b) The marking table should be protected from damage.
(c) After use, the marking table should be cleaned with a soft cloth.
(d) The surface of the marking table should not be given a thin layer of oil.

Q151. Which of the following locations is correct for installing the oil filter in the engine?
(a) Downstream of coolers in order to filter if any solid part from coolers enters the oil lines
(b) In between coolers and the oil lines coming from sump
(c) After lines going to supply the oil to the bearing after coolers
(d) Up stream of coolers in order to filter if any solid part from coolers lives the oil lines

Q152. Which of the following is NOT the correct statement when fitting rings in an internal combustion (IC) engine?
(a) This is vital for maintaining proper combustion pressure and preventing oil consumption issues.
(b) Cleaning the piston head sealing surface area thoroughly is required.
(c) Use of specialised tools to install the rings without twisting or damaging them is essential.
(d) The most crucial precaution is to ensure proper ring gap and alignment by carefully checking the end gap of each ring.

Q153. Which of the following screwdrivers has cross-shaped tips that are unlikely to slip from the cruciform slots in Philips recessed head screws?
(a) Cross-recess screwdriver
(b) Ratchet screwdriver
(c) Offset screwdriver
(d) Stumpy screwdriver

Q154. The primary function of the flux during brazing is to _____.
(a) increase the melting point of the spelter
(b) make the joint more aesthetically pleasing
(c) remove rust and prevent atmospheric effects
(d) strengthen the joint

Q155. Which of the following types of seats is made of hardened alloys and pressed or shrunk into the cylinder head, often used in aluminium engines for better durability?
(a) Insert valve seats
(b) Integral valve seats
(c) Butterfly valve seats
(d) Ring valve seats

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Q156. Which of the following types of brakes can be used with drum, disc or a combination, with air pressure providing the power instead of hydraulic fluid?

(a) Magnetic brakes
(b) Air brakes
(c) Pneumatic brakes
(d) Electric brakes

Q157. What is the term used to describe programs that distinguish between uppercase and lowercase letters, treating "yes" and "YES" as different inputs?

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

Q158. The core of the ignition coil of a spark ignition engine is made from which material?

(a) Steel
(b) Aluminium
(c) Soft iron
(d) Copper

Q159. The piston rings are placed in the ring groove and provide sealing between which of the following two parts to prevents leakage of high-pressure gases?

(a) Piston and the cylinder block
(b) Piston and the cylinder head
(c) Piston and the cylinder fins
(d) Piston and the cylinder liner

Q160. An angle greater than 180 degrees is referred to as _____.

(a) an acute angle
(b) an obtuse angle
(c) a right angle
(d) a reflex angle

Q161. Diesel fuel is generally used in which of the following types of vehicles?

(a) Heavy trucks and buses
(b) Scooters
(c) Cars
(d) Aerospace vehicles

Q162. 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) molding
(b) vulcanisation
(c) extrusion
(d) latex

Q163. How many check-valves are in a tandem master cylinder?

(a) None; it uses a pump only.
(b) Three for each wheel
(c) Two, one for front and one for rear brakes
(d) One for all brakes

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Q164. The function of a steering system is to convert the rotary movement of the steering wheel into:

(a) angular turn of the front wheels
(b) linear motion of the front wheels
(c) angular turns of the rear wheels
(d) angular velocity of the front wheels

Q165. A type of brake has a diaphragm operating in a cylinder. For application of brakes on one side, a diaphragm is subjected to atmospheric pressure while the other is applied negative pressure by exhausting air known as _____ brake.

(a) electric
(b) air
(c) hydraulic
(d) vacuum

Q166. What is the main purpose of an ignition coil in a gasoline engine?

(a) To supply fuel to the engine
(b) To control the engine's timing
(c) To regulate engine temperature
(d) To step up low voltage to high voltage

Q167. The space enclosed in the upper part of a cylinder, by the cylinder head and the piston top, during the combustion process is called:

(a) fuel digestion chamber
(b) compression ratio
(c) combustion chamber
(d) air suction zone

Q168. What is the primary purpose of preventive maintenance?

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

Q169. 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

Q170. What can happen if air gets locked in the fuel system?

(a) Reduced exhaust emissions
(b) Increased fuel efficiency
(c) Erratic running of the engine
(d) Improved engine performance

Q171. Which of the following types of piston ring is placed at the top of the piston in an IC engine?

(a) Compression ring
(b) Pressure ring
(c) Wiper ring
(d) Oil ring

Q172. What is the role of the rubber seal in the wheel cylinder?

(a) To connect the piston to the brake shoe
(b) To increase hydraulic pressure
(c) To prevent brake fluid leakage

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(d) To retract the brake shoes

Q173. _____ recommend(s) 20 mm wide margins for sheet sizes AO and A1 in engineering drawings.

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

Q174. The angle formed by the backward tilt of the steering axis from vertical, when viewed from the side of the wheel is known as _____.

(a) positive castor
(b) positive camber
(c) negative castor
(d) zero castor

Q175. 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

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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