RRB Assistant Loco Pilot (ALP) 2025 Previous Year Paper Morning

RRB Assistant Loco Pilot (ALP) • 2025 • 175 questions • 60 minutes • Answer key

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MATHEMATICS

Q1. Which of the following ecosystems has very low temperatures and frozen soil?

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

Q2. Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statements.

Statements:

Some bananas are litchis.

All litchis are kiwis.

Some kiwis are strawberries.

Conclusions:

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

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

Q3. What is the term used to describe organisms that produce their own food in an ecosystem?

(a) Producers
(b) Herbivores
(c) Consumers
(d) Decomposers

Q4. A, B, C, D, E and F live on six different floors of the same building. The lowermost floor in the building is numbered 1, the floor above it is numbered 2 and so on till the topmost floor is numbered 6. D lives on an odd-numbered floor but not 3. The sum of floors on which D and E live is 7. A lives immediately below C. F lives on the top floor. How many people live between E and F?

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

Q5. Use of energy-efficient machineries in industrial settings primarily helps _____.

(a) decrease operational efficiency
(b) reduce industrial energy requirement and improve products' competitiveness.
(c) increase energy consumption and thereby product cost
(d) extend the lifespan of outdated equipment

Q6. An ammeter has 20 divisions between 0 A and 2 A. The least count of ammeter is _____.

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

Q7. The rate of doing work is known as _____.

(a) power
(b) force
(c) kinetic energy
(d) potential energy

Q8. Match the columns.

Engineering Applications	Type of Engineering Drawings
A) Plan, front elevation of homes to be built, foundation drawings	P) Mechanical Engineering Drawings
B) Circuit diagrams and Electrical installation drawings	Q) Electronics Engineering drawings
C) PCB tracks drawings	R) Electrical Engineering drawings
D) Riveted joints and Welded joints	S) Civil Engineering drawings

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

Q9. The area of a regular polygon with a side of 8 cm is 112 cm^2. If the perpendicular distance from the centre to the side of the polygon is 7 cm, then the number of sides of the polygon is:

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

Q10. Which of the following is a geometrical figure with a three-dimensional geometry that has eight vertices and six rectangular faces?

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

Q11. In the following number-pairs, the second number is obtained by applying certain mathematical operations to the first number. Which numbers should replace X and Y so that the pattern followed by the two numbers on the left side of :: is same as that on the right side of ::?

(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.)

X : 85 :: 36 : Y

(a) X = 43, Y = 77

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(b) X = 44, Y = 73
(c) X = 42, Y = 71
(d) X = 42, Y = 73

Q12. Two plumbers, X and Y, are paid a total of Rs. 770 per day by their employer. If X is paid 140% of the sum paid to Y, then how much is Y paid (in Rs. , rounded off to two decimal places) per day?
(a) 320.83
(b) 270.83
(c) 220.83
(d) 370.83

Q13. Which of the following statements is/are true about Functional Dimensions (F) in engineering drawing?
Statement 1: Functional Dimensions are essential to the function of the component or space.
Statement 2: Functional Dimensions are typically shown without limits.
Statement 3: Functional Dimensions are only shown for reference purposes.
(a) Only statements 1 and 2 are true
(b) Only statement 1 is true
(c) Only statement 3 is true
(d) Only statements 2 and 3 are true

Q14. Which of the following is true?
(a) Both insulators and conductors allow heat to pass through them easily.
(b) Wood is a good conductor of heat.
(c) Plastic is a good conductor of heat.
(d) In a kitchen, aluminium vessels are used because aluminium is a good conductor of heat.

Q15. What should come in place of the question mark (?) in the given series?
185 174 163 152 ? 130
(a) 143
(b) 142
(c) 144
(d) 141

Q16. In the following triad, each group of letters is related to the subsequent one following a certain logic. Select from the given options, the one which follows the same logic.
TERM–ERTM–TMRE
(a) USER–RESU–REUS
(b) VICE–ICVE–VECI
(c) WHEN–HWEN–WENH
(d) ZERO–EZRO–ZREO

Q17. Which of the following is the work done by the gravitational force on the object of mass 50 kg when the object is moved from one point to another point along a horizontal line ($g = 10\ m/s^2$)?
(a) 50 J
(b) Zero
(c) 500 J
(d) −500 J

Q18. Study the given bar-graph and answer the question that follows.
The given bar-graph indicates the number of flats sold by a builder in five different cities in 2020.
The number of flats sold in Delhi is what percentage more than the number of flats sold in Mumbai?
(a) 150%
(b) 75%
(c) 120%

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(d) 125%

Q19. Which of the following letter-clusters should replace # and % so that the pattern and relationship followed between the letter-cluster pair on the left side of :: is the same as that on the right side of ::?

: HDI :: MIN : %

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

Q20. Work done is defined in science as _____.

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

GENERAL INTELLIGENCE AND REASONING

Q21. From a rectangular cardboard sheet of length 46 m and breadth 8 m, three circular plates of radii 3 m, 2 m and 1 m are cut out. If the area of the remaining part of the cardboard sheet is equal to the area of a square, then find the length of each side of the square (use π = 22/7).

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

Q22. In hot climate regions, the outer walls of the house are preferred to be white in colour because _____.

(a) white colour looks good
(b) white colour makes the wall more durable
(c) white colour absorbs more sunlight to make the house bright
(d) white colour reflects sunlight to make the interior of the house cool

Q23. Convert 1 kilowatt hour (kW h) into joule.

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

Q24. A fruit seller initially had some apples. He sold 40% of those and still had 300 apples. How many apples did he initially have?

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

Q25. Ten people are sitting in two parallel rows with five people each in such a way that there is equal distance between adjacent persons.

In row I, A, B, C, D and E are seated and all of them are facing south.

In row II, R, S, T, U and V are seated and all of them are facing north.

Thus each person faces another person from the other row. A sits at the extreme right end of their row and is facing U. R sits at the centre of their row and is facing C. E sits between C and D and is facing T. S sits at the extreme right end of their row.

Who sits exactly opposite B?

(a) U

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

Q26. Which of the following is the safest method for disposing of toxic dust?
(a) Dumping it in regular trash bins
(b) Releasing it into the air for dilution
(c) Sweeping it into open areas
(d) Using specialised hazardous waste disposal containers

Q27. What is the total circuit resistance if it contains resistors 10 Ω, 20 Ω and 60 Ω, connected in parallel?
(a) 90 Ω
(b) 60 Ω
(c) 20 Ω
(d) 6 Ω

Q28. What should come in place of the question mark (?) in the given alpha-numeric series?
G5, I10, L15, N20, Q25, S30, ?
(a) W35
(b) V35
(c) V40
(d) U35

Q29. Find the value of $x^2 + y^2$, given the following.
$x = 7 + \sqrt{5}$, $y = 7 - \sqrt{5}$
(a) 124
(b) 96
(c) 108
(d) 137

Q30. Which of the following relations is NOT correct?
(a) Electric Power = $(\text{Current})^2 \times \text{Resistance}$
(b) Electric Power = $(\text{Voltage})^2 / \text{Resistance}$
(c) Electric Power = Voltage / Current
(d) Electric Power = Voltage × Current

Q31. Which of the following statements is/are true?
Statement 1: Heat conductors allow heat to pass through them easily.
Statement 2: All plastics are good conductors of heat.
(a) Neither statement 1 nor 2
(b) Only statement 2
(c) Both statements 1 and 2
(d) Only statement 1

Q32. Refer to the following letter and symbol series and answer the question that follows. Counting to be done from left to right only.
(Left) ^ T J # * £ B L R Ω Y # E % S U $ K Q & (Right)
How many such letters are there, each of which is immediately preceded by a letter and also immediately followed by a symbol?
(a) Four
(b) Three
(c) Two
(d) One

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Q33. Which of the following is a supplementary protocol that allows non-ASCII data to be sent through e-mail?

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

Q34. An ammeter of range 0 to 10 A shows a current of 7.5 A. If its true value is 6.2 A, the relative error is _____.

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

Q35. Jaspreet deposited a sum of Rs. 58,550 at 20% rate of interest per annum, compounded annually. The total amount (in Rs.) received by Jaspreet after 2 years will be:

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

Q36. Which of the following expressions is NOT correct for electric power?

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

Q37. A piece of rod 8/9 metre long is broken into two pieces. If one piece is 1/3 metre long, find the length (in m) of the other piece.

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

Q38. Which of the following noise levels is considered potentially harmful to human health if experienced over extended periods?

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

Q39. Kinetic energy and potential energy together are called which form of energy?

(a) Chemical
(b) Mechanical
(c) Thermal
(d) Nuclear

Q40. What should be done immediately after a fuel spillage in a workshop?

(a) Leave it unattended and inform the supervisor later
(b) Use water to wash it away
(c) Cover it with plastic to prevent evaporation
(d) Evacuate the area and contain the spill using absorbent materials

Q41. The areas of three adjacent faces of a solid cuboid are 216 cm^2, 114 cm^2 and 19 cm^2. What is the volume (in cm^3) of the cuboid?

(a) 532
(b) 880

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(c) 684
(d) 955

Q42. What is the primary source of energy for most of the ecosystems?
(a) Water
(b) Sunlight
(c) Soil
(d) Wind

Q43. How many base units are used to measure the physical quantities, according to SI units system?
(a) 5
(b) 4
(c) 10
(d) 7

Q44. If 'A' stands for '÷', 'B' stands for '×', 'C' stands for '+' and 'D' stands for '−', what will come in place of the question mark (?) in the following equation?
38 C 32 A 4 D 5 B 7 = ?
(a) 9
(b) 10
(c) 11
(d) 8

Q45. Which of the following will verify the credentials and documents of applicants uploaded on National Scholarship Portal?
(a) University/Institute in which applicant is studying
(b) National Scholarship Portal
(c) Third party
(d) Government

BASIC SCIENCE AND ENGINEERING

Q46. A cube with a mass of 5.74 g occupies a volume of 1.2 cm^3. The density (in g/cm^3) expressed with the correct number of significant figures is _____.
(a) 4.8
(b) 4.78
(c) 4.783
(d) 4.7833

Q47. The weight of an object on Earth is 60 N. What is its weight on the surface of the moon?
(a) 60 N
(b) 6 N
(c) 600 N
(d) 10 N

Q48. Which of the following orders of components is primarily responsible for executing instructions, storing permanent firmware, temporarily storing data during program execution and providing a platform for interconnecting hardware components on a computer motherboard?
(a) CPU - ROM - RAM - PCB
(b) CPU - RAM - ROM - PCB
(c) RAM - ROM - CPU - PCB
(d) PCB - ROM - CPU - RAM

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Q49. In the SI system, which of the following options best describes the base quantities?

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

Q50. 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 two people sit between P and Q. A faces the person sitting to the immediate left of P. R sits to the immediate left of S. D sits to the immediate right of C. Who among the following faces P?

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

Q51. Which of the following actions can help prevent slip and fall injuries?

(a) Ignoring clutter in walkways
(b) Wearing loose footwear for comfort
(c) Cleaning up spills immediately and using warning signs
(d) Walking on wet floors carefully

Q52. A man purchased two varieties of pens at the rates of Rs. 8 for 9 pens and Rs. 8 per pen. If he purchased an equal number of pens of each of the two varieties and then sold all his pens at Rs. 6 per pen, what was his profit percentage?

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

Q53. Ganpat starts from Point A and walks 18 m towards west. He takes a left turn, walks 32 m, takes a left turn, walks 26 m, turns left, walks 61 m and stops at Point B. Meena starts from Point Z, which is 22 m towards the east of Point A. She walks 42 m towards north, takes a right turn, walks 35 m, turns right and walks 13 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) 52 m
(b) 49 m
(c) 57 m
(d) 43 m

Q54. Which of the following statements is correct about negative work done?

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

Q55. 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.)

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

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Q56. A 280 m long train running at a speed of 72 km/hr passes a platform in 30 seconds. Find the length of the platform (in m).

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

Q57. Amit's income in 2019 was Rs. 27,000. He gets an increment of 10% every year. What was his income (in Rs.) in 2021?

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

Q58. In a certain code language,

'A + B' means 'A is the mother of B',

'A − B' means 'A is the brother of B',

'A × B' means 'A is the wife of B' and

'A & B' means 'A is the father of B'.

How is E related to T if 'E & F + G − H × T'?

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

Q59. What does the symbol given below denote in a circuit diagram?

[Figure: see this question online]

(a) Voltmeter
(b) Variable resistor
(c) Voltage source
(d) Resistor

Q60. A dozen pairs of jeans quoted at Rs. 3,520 are available at a discount of 35%. How many pairs of jeans can be bought for Rs. 572?

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

Q61. 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:

I. Some desks are tables.

II. All tables are cabinets.

III. All cabinets are beds.

Conclusions:

I. Some beds are tables.

II. All cabinets are desks.

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

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Q62. In a certain code language, ‘CARD’ is coded as ‘8674’ and ‘MICE’ is coded as ‘3517’.

What is the code for ‘C’ in the given code language?

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

Q63. Based on the English alphabetical order, three of the following four letter-clusters are alike in a certain way and thus form a group. Which letter-cluster 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.)

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

Q64. Four resistors of 4 ohm each are connected in parallel. Four such parallel combinations are then connected in series. The equivalent resistance is _____.

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

Q65. The average of three numbers is 20. If two numbers are 16 and 24, the third number is:

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

Q66. Vijay rides a bicycle 10 m from home to his tuition, then 5 m to a shop. He travels back home the same way, covering the same distance. What is his total path length?

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

Q67. Each of Preeti, Kiran, Grace, Ankit, Deepak, Nitin and Neelam has an exam on a different day of a week, starting from Monday and ending on Sunday of the same week.

Preeti has an exam on Thursday. Only one person has an exam between Preeti and Nitin. Grace has exam on the day immediately before Nitin but not on a Monday. Only two people have exams between Grace and Deepak. Neelam’s exam is on one of the days before Ankit's but on one of the days after Kiran's. Who among the following has an exam on Monday?

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

Q68. Which of the following statements regarding the use of a fire extinguisher is/are correct?

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

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

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

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Q69. Which of the following best describes the primary function of a digital signature in electronic communication?

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

Q70. Study the given diagram carefully and answer the question that follows. The numbers in different sections indicate the number of children preferring different desserts.

How many children prefer both pastries and ice creams but NOT chocolates?

[Figure: see this question online]

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

Q71. Megha bought a bag for Rs. 1,271 after getting a discount of 18% on its marked price. Find the marked price of the bag.

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

Q72. The sum of the ages of Yash and his father is 90 years. When Yash is as old as his father's present age, he will be five times as old as his son Suraj's present age. Suraj will be 12 years older than Yash's present age, when Yash is as old as his father at present. How old is Suraj at present?

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

Q73. Simplify $976 \times 265 + 976 \times 735$.

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

Q74. What should come in place of the question mark (?) in the given series?

893 891 889 887 ? 883

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

Q75. The average of 5 results is 51 and that of the first 4 is 50. The 5th result is _____.

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

Q76. Rinku riding his car covers 136 metres in 17 seconds. What is his speed (in km/hr)?

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

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Q77. Potential energy belongs to which of the following categories of energy?

(a) Heat energy
(b) Mechanical energy
(c) Light energy
(d) Chemical energy

Q78. Which of the following is NOT a valid representation of electrical power P in a circuit?
(The current, potential difference and resistance are written symbolically as I, V and R, respectively.)

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

Q79. Which type of thermometer is used for measuring the internal temperature of ice?

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

Q80. According to the ISO-A size series, what is the designation of a trimmed sheet with dimensions 297 mm × 420 mm?

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

Q81. On which of the following factors does the resistivity of a conductor depend?

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

Q82. What is the value of 10 km/hr in SI units?

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

Q83. Refer to the following letter and symbol series and answer the question that follows. Counting to be done from left to right only.
(Left) L R Ω Y A $ K ^ T J # Q & # E % S U * £ B (Right)
How many such symbols are there, each of which is immediately preceded by a vowel and also immediately followed by a letter?

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

Q84. Which of the following is NOT a benefit of use of mobile governance using ICT?

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

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Q85. If A is an acute angle and p tan A = n sec A, then what is the value of $(p^2 - n^2) / (p\ n)$?

(a) cos A cot A
(b) sin A cos A
(c) cot A cos A
(d) tan A / sec A

Q86. 6 men or 5 women can complete a job in 7 days. 6 men work for 5 days and leave. The number of women required to complete the remaining work in 5 days is:

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

Q87. Two resistors of resistance 20 Ω and 30 Ω are connected in series in a circuit. What is the current flow in the circuit if the voltage given is 250 V?

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

Q88. Which of the following is the best way to identify workplace hazards?

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

Q89. In a hospital, the ratio between the number of doctors and the number of nurses was 1 : 3. When 12 new doctors joined the hospital and 24 nurses left the hospital, the ratio became 3 : 4. After the resignation of k more nurses from the hospital, the ratio becomes 1 : 1. Find the value of k.

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

Q90. If 5/9 of a number is 6 more than 1/2 of the number, then what is the number?

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

Q91. If $x^3 + y^3 = 16$ and $x + y = 4$, what is the value of xy?

(a) 1.0
(b) 2.2
(c) 4
(d) 3

Q92. What is the average human body temperature?

(a) 37°C
(b) 42°C
(c) 40°C
(d) 32°C

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Q93. In the following series, only one letter-cluster is incorrect. Select the INCORRECT letter-cluster.

PCO MEM JGK GIJ DKG AME

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

Q94. Which of the following devices is used to measure temperature?

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

Q95. Which of the following statements about geometric figures is/are true?

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

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

Q96. Two sets of numbers are given below. In each set of numbers, certain mathematical operation(s) on the first number result(s) in the second number. Similarly, certain mathematical operation(s) on the second number result(s) in the third number and so on. Which of the given options follows the same set of operations as in the given sets?

(NOTE: Operations should be performed on the whole numbers, without breaking down the numbers into their constituent digits. E.g. 13 – Operations on 13 such as adding/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.)

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

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

Q97. A copper spoon is dipped in hot water. What happens to its other end?

(a) It becomes cold by conduction.
(b) It becomes hot by conduction.
(c) It becomes cold by convection.
(d) It becomes hot by convection.

Q98. If 50 : x :: x : 32, and x > 0, then find the value of x.

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

Q99. In a certain code language, ‘BARE’ is coded as ‘8264’ and ‘RIDS’ is coded as ‘3587’. What is the code for ‘R’ in the given code language?

(a) 5
(b) 8
(c) 3
(d) 6

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Q100. A cistern has two inlets I1 and I2. I1 alone can fill it in 8 hours and I2 in 4 hours. If both the inlets are open, what will be the time required to fill the cistern.

(a) 2 hours
(b) 3 2/3 hours
(c) 2 2/3 hours
(d) 4 2/3 hours

Q101. What is the phase difference between the line voltage and phase voltage in a star-connected load?

(a) 120°
(b) 30°
(c) 90°
(d) 0°

Q102. Calculate the voltage regulation (in percentage) of the transformer if the no load secondary voltage is 250 V and full load secondary voltage is 200 V?

(a) 50%
(b) 25%
(c) 20%
(d) 100%

Q103. In the open circuit test of a transformer, the supply frequency should be:

(a) lower than the rated frequency
(b) independent of the rated frequency
(c) higher than the rated frequency
(d) equal to the rated frequency

Q104. A TRIAC (Triode for Alternating Current) is a _____ device.

(a) Bilateral device
(b) Unilateral device
(c) One-terminal device
(d) Two-terminal device

Q105. A DC generator is running at constant speed. If the load current increases, what happens to the terminal voltage?

(a) Increases
(b) Decreases
(c) Fluctuates randomly
(d) Remains constant

Q106. Why is it important for every person to follow safety procedures in the workplace?

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

Q107. Which of the following vices consists of a handle and a small collet chuck at one end?

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

Q108. What type of components are used for tapping in the ring main system?

(a) Directly from the main supply
(b) Through fuses and controlling switches
(c) Through capacitors
(d) Using transformers

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Q109. What is a key advantage of using MOSFETs in electronic circuits compared to other types of transistors?

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

Q110. In rotating armature type alternator, magnetic field is produced by:

(a) Commutator
(b) DC electromagnets placed on stator
(c) Slip rings on rotor
(d) Slip rings and brushes

Q111. Arrange the following steps in the correct order to draw an equilateral triangle with each side of 35 mm.

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

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

Q112. Which of the following best describes the construction of a mica capacitor?

(a) A ceramic disc with metal coatings
(b) A thin polymer film rolled into a cylinder
(c) A liquid electrolyte between two aluminium plates
(d) Alternating layers of metal foil and mica sheets

Q113. Which component in a magnetic hydraulic MCB holds the ferrous plunger?

(a) A non-ferrous tube
(b) A bimetallic strip
(c) A thermal coil
(d) A fuse element

Q114. Which of the following is a characteristic of an SCR?

(a) It cannot control the flow of current.
(b) It is a two-terminal device.
(c) It has no gate terminal.
(d) It is a four-layer, three-junction device.

Q115. The magnitude of EMF induced by an alternator is given as:

(Given: B is the flux density, L is the length of the conductors, V is the velocity of the rotation and q is the angle at which the conductor cuts the line of force)

(a) BLV Cosq
(b) (BV Cosq)L
(c) BLV Sinq
(d) (BL Sinq)/V

Q116. Gaskets, seals and spacers are made using:

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

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Q117. According to BIS SP 46-2003, which of the following applications is correctly represented by a chain-thin line in engineering drawings?

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

Q118. Alternators run at a speed _____ synchronous speed.

(a) less than or greater than
(b) only greater than
(c) equal to
(d) only less than

Q119. A transformer's open circuit test is used to determine:

(a) core losses and no load current
(b) stray loss
(c) copper loss
(d) windage loss

Q120. How long does a fuse element take to melt when carrying twice its rated current?

(a) 2 minutes
(b) 5 minutes
(c) 30 seconds
(d) 1 minute

Q121. A 20 kVA, 2500/250 V, 50 Hz, single phase transformer gave the open circuit test result (on low voltage side) as 250 V, 1.6 A and 100 W; then no load power factor is:

(a) 0.15
(b) 0.1
(c) 0.2
(d) 0.25

Q122. If two inductors are connected in series with mutual inductance M (aiding), what is the equivalent inductance?

(a) Leφ = (L1 + L2)/(L1 * L2)
(b) Leφ = L1 + L2 − 2M
(c) Leφ = L1 + L2 + 2M
(d) Leφ = (L1 + L2)/2

Q123. What should you do to ensure your personal safety at work?

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

Q124. In star connected alternator, the relation between line voltage, El and phase voltage, Eph is given by:

(a) El = 3Eph
(b) El = √3Eph
(c) El = 1/3Eph
(d) El = Eph

Q125. Low speed diesel engine alternators employ rotor of _____ type.

(a) cylindrical stator construction
(b) rotating armature construction
(c) salient pole construction
(d) slip ring construction

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Q126. At what overload percentage does the solenoid attract the armature fully, causing instantaneous tripping in a MCB?

(a) 1000%
(b) 700%
(c) 130%
(d) 300%

Q127. In a lead-acid battery, what is the chemical composition of the material used for the positive plate during discharge?

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

Q128. What is the primary material used in the resistance wire of wire-wound resistors?

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

Q129. When selecting a sheet size for an original drawing, what should be the primary consideration?

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

Q130. Which of the following instruments is used to test the earth resistance of an earthing system?

(a) Megger
(b) Clamp meter
(c) Multimeter
(d) Oscilloscope

Q131. Which of the following files is used for filing narrow grooves and angles above 10°?

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

Q132. Which of the following is an important safety measure during a power failure?

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

Q133. A 220 V shunt generator has a field resistance of 110 Ω. What is the field current?

(a) 5 A
(b) 10 A
(c) 20 A
(d) 2 A

Q134. In a velocity-time graph, the negative slope represents _____.

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

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Q135. Non-functional dimensions are _____.

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

Q136. In the context of earthing in an electrical system, _____ has the greatest impact on earth resistance.

(a) soil resistivity
(b) the material of the grounding rod
(c) the voltage applied to the ground
(d) the length of the earthing conductor

Q137. What type of device is a UJT?

(a) Bipolar junction device
(b) Metal-oxide-semiconductor device
(c) Unipolar junction device
(d) Optical device

Q138. A 20 kVA, 2500/250 V, 50 Hz, single phase transformer gave the open circuit test result (on low voltage side) as 250 V and 100 W; then core loss current is:

(a) 0.3 A
(b) 0.4 A
(c) 0.2 A
(d) 0.1 A

Q139. Which of the following hand-operated drilling machines is used for drilling small diameter holes up to 6 mm?

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

Q140. What is the primary reason for electrical injuries when a person comes in contact with electrical equipment?

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

Q141. A circuit consists of three resistors; 15 ohms, 10 ohms, and 20 ohms. The 15-ohm resistor is in series with the parallel combination of the 10-ohm and 20-ohm resistors. If a 24 V battery is applied across the circuit, what is the total current flowing through the circuit?

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

Q142. Permeability of ideal transformer core is equal to:

(a) infinite
(b) unity
(c) low value
(d) zero

Q143. In a three-phase, balanced system, if the load is purely resistive, the line current is _____.

(a) 90° ahead of the line voltage
(b) 90° behind the line voltage
(c) unrelated to the line voltage

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(d) in phase with the line voltage

Q144. Read the given statements carefully and select the correct option.

Statement 1: Plate earthing ensures a low-resistance path for fault current to safely flow into the earth.

Statement 2: The resistance of the earthing system is not affected by the soil type or moisture content.

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

Q145. If the current flowing through a conductor is 5 A and the resistance of the conductor is 10 ohms, what will be the voltage across the conductor, according to Ohm's Law?

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

Q146. When a strong magnet is placed near a weak magnet, what will likely happen?

(a) The strong magnet will lose its magnetism.
(b) The strong magnet will induce magnetism in the weak magnet.
(c) The weak magnet will disappear.
(d) The weak magnet will repel the strong magnet.

Q147. What is the effect of increasing the field current in a DC shunt motor?

(a) The motor speed decreases.
(b) The motor speed increases.
(c) The motor stops immediately.
(d) The torque decreases.

Q148. Which of the following parts of a file is the part fitted to the tang for holding the file?

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

Q149. Where are ceramic capacitors commonly used?

(a) High-power motors
(b) Transformers
(c) Mobile Phones
(d) TV circuits

Q150. Which of the following organisations is responsible for enforcing workplace safety regulations in India?

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

Q151. A drawing instrument box is used to carry all _____ instruments.

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

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Q152. What is the advantage of giving heat treatment to a material?

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

Q153. For what purpose are pins and clips used in engineering drawings?

(a) To fasten the drawing sheet on to the drawing board firmly so that it does not shake
(b) To draw horizontal lines, parallel lines and to guide/hold the set squares
(c) To transfer dimensions and dividing lines into a number of equal parts
(d) To support the drawing paper/tracing paper for making drawings

Q154. If [Formula above], find cos θ.

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

Q155. What is the primary use of a Unijunction Transistor (UJT) in electronic circuits?

(a) Frequency modulation
(b) Triggering of SCRs and TRIACs
(c) Voltage regulation
(d) Amplification of signals

Q156. A circular hole of radius 3 cm is cut from a rectangular sheet of dimensions 12 cm × 10 cm. Find the remaining area.

(Take π = 3.14)

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

Q157. What happens if the gate current is removed while a TRIAC is conducting?

(a) The TRIAC will not be affected.
(b) The TRIAC will remain conducting until the current falls below the holding current.
(c) The TRIAC will stop conducting.
(d) The TRIAC will behave like a short circuit.

Q158. Air-cored inductors are most commonly used in circuits operating at/in:

(a) high frequencies from 1 MHz to several hundred MHz
(b) audio frequency range (20 Hz – 20 kHz)
(c) low frequencies below 50 Hz
(d) DC power supply circuits

Q159. Which of the following options is correct?

Statement 1: In a balanced three-phase system, the power delivered to the load depends on both the phase current and the phase voltage.

Statement 2: The line voltage in a star-connected system is always greater than the phase voltage by a factor of √3.

(a) Both Statement 1 and Statement 2 are true.
(b) Statement 1 is true, and Statement 2 is false.
(c) Statement 1 is false, and Statement 2 is true.
(d) Both Statement 1 and Statement 2 are false.

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Q160. Which of the following types of pliers is used to shape loops in wires and to form curves in light metal strips?

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

Q161. When measuring the resistance of a resistor using an ohmmeter, what does a reading of zero resistance indicate?

(a) The ohmmeter is malfunctioning.
(b) The resistor is open-circuited.
(c) The resistor is functioning normally.
(d) The resistor is short-circuited.

Q162. What is the sum of (3/8) + (5/12)?

(a) 7/12
(b) 17/24
(c) 8/20
(d) 19/24

Q163. What is the main purpose of continuity testing in a DC generator?

(a) To check voltage regulation
(b) To detect open or broken windings
(c) To test insulation resistance
(d) To measure current flow

Q164. Which of the following statements is NOT true if any electrical system is not properly earthed?

(a) It may lead to damage of electrical equipment.
(b) It can increase the risk of electric shock.
(c) It provides voltage constant voltage supply regardless of perturbation in load side.
(d) It may cause the electric current to flow in an uncontrolled manner.

Q165. What is the purpose of an emergency evacuation plan?

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

Q166. Which of the following is a key safety measure to follow when installing an earthing system?

(a) Ensure the earthing system is properly inspected and tested for safety compliance.
(b) Use flexible conductors for earthing connections.
(c) Use thin copper wires for earthing to reduce costs.
(d) Ensure the earthing system is designed for maximum efficiency.

Q167. IEEE 80 provides recommendations for _____.

(a) voltage regulation in power systems
(b) measurement of electrical power consumption
(c) proper installation of grounding and bonding systems in electrical installations
(d) standards for electrical insulation materials

Q168. Why is armature resistance control NOT suitable for speed control in high-power DC motors?

(a) It causes high torque fluctuations.
(b) It increases field current.
(c) It results in poor efficiency due to high power loss.
(d) It cannot reduce the motor speed.

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Q169. When using a multimeter to measure current, which of the following is correct?

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

Q170. What is the basic working principle of a DC generator?

(a) Mutual induction
(b) Lenz's law
(c) Faraday's law of electromagnetic induction
(d) Electrostatic induction

Q171. In a balanced star-connected system, the neutral point _____.

(a) carries current even in balanced loading conditions
(b) is always at a voltage equal to any phase
(c) is at a higher constant voltage relative to the ground
(d) is at zero potential with respect to all phases

Q172. Where are Kit-Kat type fuses commonly used?

(a) Power generation plants
(b) Domestic and small industrial electrical circuits
(c) Electronic circuits
(d) High-voltage transmission systems

Q173. A three-phase AC circuit is connected with star connected balanced load of 100 Ω. If phase voltage of each phase is 200 V, the current in each phase will be ____.

(a) 0.5 A
(b) 4 A
(c) 2 A
(d) 1 A

Q174. Which of the following factors DOES NOT affect the rating of a fuse?

(a) The cross-sectional area of the conductor
(b) The type of electrical load
(c) The ambient temperature
(d) The colour of the fuse holder

Q175. The unit for specific gravity is _____.

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

ANSWER KEY

1	a	2	c	3	a	4	c	5	b	6	b	7	a	8	b	9	d	10	a
11	d	12	a	13	b	14	d	15	d	16	b	17	b	18	a	19	b	20	c
21	a	22	d	23	d	24	c	25	d	26	d	27	d	28	b	29	c	30	c
31	d	32	a	33	a	34	d	35	b	36	b	37	c	38	b	39	b	40	d
41	c	42	b	43	d	44	c	45	a	46	a	47	d	48	a	49	b	50	b
51	c	52	c	53	b	54	d	55	a	56	b	57	b	58	a	59	b	60	a
61	b	62	a	63	d	64	d	65	c	66	b	67	d	68	b	69	d	70	b

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71	b	72	c	73	b	74	b	75	b	76	b	77	b	78	a	79	d	80	b
81	c	82	b	83	b	84	a	85	b	86	d	87	a	88	c	89	a	90	c
91	c	92	a	93	d	94	d	95	b	96	b	97	b	98	a	99	b	100	c
101	b	102	b	103	d	104	a	105	b	106	b	107	d	108	b	109	b	110	b
111	c	112	d	113	a	114	d	115	c	116	c	117	d	118	c	119	a	120	a
121	d	122	c	123	a	124	b	125	c	126	b	127	c	128	a	129	b	130	a
131	a	132	b	133	d	134	c	135	d	136	a	137	c	138	b	139	b	140	d
141	b	142	a	143	d	144	a	145	b	146	b	147	a	148	b	149	d	150	c
151	c	152	a	153	a	154	c	155	b	156	d	157	b	158	a	159	a	160	c
161	d	162	d	163	b	164	c	165	b	166	a	167	c	168	c	169	d	170	c
171	d	172	b	173	c	174	d	175	a										

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