



रेल भर्ती बोर्ड / RAILWAY RECRUITMENT BOARDS

सी ई एन - ०१/२०२५ - CEN - 01/2025

सहायक लोको पायलट की भर्ती/ Recruitment of Assistant Loco Pilot

Test Date	28/07/2026
Test Time	2:30 PM - 5:00 PM
Subject	ALP Stage 2 Mechanic Motor Vehicle

*** Note**

Correct Answer will carry 1 mark per Question.

Incorrect Answer will carry 1/3 Negative mark per Question.

1. Options shown in green color with a tick icon are correct.

2. Chosen option on the right of the question indicates the option selected by the candidate.

Section : **PART-A**

Q.1 Which statement best describes how the mass and speed of an object affect its kinetic energy?

- Ans**
- ☒ A. An object with greater mass and higher speed will have more kinetic energy.
 - ☐ B. An object with greater mass but lower speed will have more kinetic energy.
 - ☐ C. An object with same mass but higher speed will have less kinetic energy.
 - ☐ D. An object with less mass and lower speed will have more kinetic energy.

Q.2 Which of the following is the best example of municipal solid waste?

- Ans**
- ☐ A. Mining tailings
 - ☒ B. Household kitchen garbage
 - ☐ C. Industrial process waste
 - ☐ D. Hospital biomedical waste

Q.3 What will come in the place of '?' in the following equation, if '+' and '-' are interchanged and 'x' and '÷' are interchanged?
 $5 \div 3 + 15 \times 5 - 3 = ?$

- Ans**
- ☐ A. 12
 - ☐ B. 9
 - ☒ C. 15
 - ☐ D. 18

Q.4 Which factor increases the amount of heat produced in a wire when an electric current flows through it for a fixed time?

- Ans**
- ☐ A. Decreasing the length of the wire
 - ☐ B. Reducing the current in the wire
 - ☒ C. Increasing the resistance of the wire
 - ☐ D. Making the wire thicker

Q.5 A question is followed by two statements numbered (I) and (II). You have to decide whether the data provided in the statements are sufficient to answer the question. Read both the statements and decide the appropriate answer.

Among 5 sticks, B, U, N, M and D, each having a different height, which stick is the shortest?

(I) D is shorter than U. M is shorter than B.

(II) M is taller than D.

- Ans**
- ☒ A. Both statements I and II together are NOT sufficient to answer the question
 - ☐ B. Data in statement I alone is sufficient to answer the question while data in statement II is not
 - ☐ C. Both statements I and II together (and not statement I alone or statement II alone) are sufficient to answer the question
 - ☐ D. Data in statement II alone is sufficient to answer the question while data in statement I is not

Q.6 Why does biomedical waste require special handling compared to general municipal waste?

- Ans**
- ☒ A. It may contain infectious agents that pose health risks.
 - ☐ B. It is always radioactive and requires heavy shielding.
 - ☐ C. It has higher chemical content and is always toxic.
 - ☐ D. It is more likely to be recycled than other types of waste.

Q.7 Simplify the following expression.

11 of $7 + 125 \div 5 + 99 \div 11 \times 7 - 17$ of $7 + 7 \times 6 - (91 \div 7 + 7 \times 5)$

- Ans**
- ☐ A. 44
 - ☐ B. 36
 - ☐ C. 48
 - ☒ D. 40

Q.8 In a certain code language, 'SOIL' is coded as '1547' and 'COIL' is coded as '7124'. What is the code for 'C' in the given code language?

- Ans**
- ☐ A. 7
 - ☒ B. 2
 - ☐ C. 1
 - ☐ D. 4

Q.9 Which intervention most effectively reduces ground-level pollutant concentrations during a winter temperature inversion?

- Ans**
- ☐ A. Increasing surface temperatures near emission sources
 - ☐ B. Elevating emission sources above inversion layers
 - ☒ C. Enhancing vertical air mixing through artificial turbulence
 - ☐ D. Reducing local wind speed to minimize horizontal dispersion

Q.10 An engineering firm is tasked with creating a set of technical drawings for a large-scale project. The client specifies that all components must fit on a single sheet without reducing the drawing scale, and the total drawing area required is approximately 1 square meter. Based on standard drawing sheet sizes, which sheet should the firm select to best meet these requirements?

- Ans**
- ☐ A. A1 size sheet
 - ☐ B. A2 size sheet
 - ☐ C. A3 size sheet
 - ☒ D. A0 size sheet

Q.11 A, B, C, D, X, Y and Z are sitting around a circular table facing the centre of the table.
Only two people sit between Y and C when counted from the left of C. D sits third to the left of B. A sits to the immediate right of B. A sits second to the left of Y. Z is not an immediate neighbor of D.
Who sits third to the right of X?

- Ans**
- ☒ A. D
 - ☒ B. A
 - ☒ C. Y
 - ☒ D. C

Q.12 What does the term 'HAZOP' stand for in occupational safety?

- Ans**
- ☒ A. Hazardous Operations Safety
 - ☒ B. Handling and Organizing Safety
 - ☒ C. Hazardous Operation Standard
 - ☒ D. Hazard and Operability Study

Q.13 The average of five numbers is 30. If four of the numbers are 25, 35, 28 and 32, then what is the fifth number?

- Ans**
- ☒ A. 35
 - ☒ B. 32
 - ☒ C. 30
 - ☒ D. 28

Q.14 If a rectangular field is measured to be 120 meters long and 75 meters wide, what is its area in SI units?

- Ans**
- ☒ A. 15000 square meters
 - ☒ B. 9000 square meters
 - ☒ C. 1800 square meters
 - ☒ D. 19500 square meters

Q.15 If the mean of the following data is 45, then what is the value of x?

Class	10-20	20-30	30-40	40-50	50-60
Frequency	23	30	31	45	X

- Ans**
- ☒ A. 160
 - ☒ B. 180
 - ☒ C. 188
 - ☒ D. 162

Q.16 If the height of an object is doubled while its mass remains constant, its gravitational potential energy will be:

- Ans**
- ☒ A. unchanged
 - ☒ B. doubled
 - ☒ C. halved
 - ☒ D. decreased to one-fourth

Q.17 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 Satish related to Mayank if 'Satish + Deep × Piyush – Hitesh % Mayank'?

- Ans**
- ☒ A. Mother's brother's wife's sister
 - ☒ B. Father's brother's wife's mother
 - ☒ C. Mother's brother's wife's mother
 - ☒ D. Father's brother's wife's sister

Q.18 A hiker lifts a backpack from the ground to a ledge 2 meters above the ground. Which situation would result in the greatest increase in the backpack's gravitational potential energy?

- Ans**
- ☒ A. Lifting the same backpack to a 1-meter ledge
 - ☒ B. Carrying the same backpack horizontally for 2 meters
 - ☒ C. Lifting a heavier backpack to the same 2-meter ledge
 - ☒ D. Lifting a lighter backpack to the same 2-meter ledge

Q.19 What is a key feature of single stroke lettering in technical drawings?

- Ans**
- ☒ A. Each character is made with one continuous stroke.
 - ☒ B. Each character is outlined and then filled.
 - ☒ C. Each character is made with several parallel lines.
 - ☒ D. Each character is shaded after drawing.

Q.20 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.)

- Ans**
- ☒ A. IT – KV
 - ☒ B. DG – EH
 - ☒ C. SJ – TK
 - ☒ D. KE – LF

Q.21 What does CPU stand for in computing?

- Ans**
- ☒ A. Computer Processing Unit
 - ☒ B. Control Processing Unit
 - ☒ C. Central Processing Unit
 - ☒ D. Core Processing Unit

Q.22 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.)

- Ans**
- ☒ A. HB-IC
 - ☒ B. PJ-QK
 - ☒ C. FZ-GA
 - ☒ D. RL-SN

Q.23 A, B, C, D and E have different heights. E is taller than C but shorter than A. Only one person is taller than A. D is shorter than C. Who amongst them is the third tallest?

- Ans**
- ☒ A. A
 - ☒ B. E
 - ☒ C. B
 - ☒ D. C

Q.24 Which of the following correctly states the full form of CD and the technology used to store data on it?

- Ans**
- ☒ A. Compact Disc, Optical Storage
 - ☒ B. Compact Drive, Magnetic Storage
 - ☒ C. Compact Disc, Magnetic Storage
 - ☒ D. Compact Drive, Optical Storage

Q.25 Seven boxes, P, Q, S, T, U, V, and W, are kept one over the other, but not necessarily in the same order. There are exactly two boxes between T and P. Only Q is kept above U. No box is kept below P. S is kept somewhere below W but above V. Based on the given information, which box is kept third above V?

- Ans**
- ☒ A. P
 - ☒ B. W
 - ☒ C. T
 - ☒ D. S

Q.26 Which type of personal protective equipment is most suitable for tasks involving airborne chemical particles in confined spaces?

- Ans**
- ☒ A. Respiratory protection devices such as half-face masks
 - ☒ B. Body protection with flame-retardant suits
 - ☒ C. Hand protection using chemical-resistant gloves
 - ☒ D. Head protection with industrial-grade hard hats

Q.27 Which of the following statements best describes a triangle as used in engineering drawing?

- Ans**
- ☒ A. A triangle is a polygon with four straight sides and four angles.
 - ☒ B. A triangle must always have all sides of equal length.
 - ☒ C. A triangle is a polygon with three straight sides and three angles.
 - ☒ D. A triangle is a polygon having three curved sides.

Q.28 Refer to the given letter series and answer the question that follows.

(Left) A X T N K R Q K C P S I D F J U D O R G Z M B E L (Right)

How many letters are there in the English alphabetical series between the letter that is fourth from the right end and the letter that is third from the left end of the series?

- Ans**
- ☒ A. 6
 - ☒ B. 4
 - ☒ C. 3
 - ☒ D. 5

Q.29 A ramp is used to lift a box to a platform 2 m high. To reduce the effort required, the ramp length is increased from 4 m to 8 m. Assuming negligible friction, what remains unchanged?

- Ans**
- ☒ A. The work done in raising the box
 - ☒ B. The mechanical advantage
 - ☒ C. The force required
 - ☒ D. The distance moved along the ramp

Q.30 Which scenario best demonstrates proactive workplace safety behavior?

- Ans**
- ☒ A. Reporting hazards after incidents happen
 - ☒ B. Identifying and correcting hazards before accidents occur
 - ☒ C. Waiting for a supervisor to notice hazards
 - ☒ D. Discussing only past safety problems in meetings

Q.31 A ladder is leaning against a wall and makes an angle of 60° with the ground. If the length of the ladder is 24 m, find the distance of the foot of the ladder from the wall.

- Ans**
- ☒ A. 9 m
 - ☒ B. 15 m
 - ☒ C. 12 m
 - ☒ D. 18 m

Q.32 A cyclist travels from the kilometer stone marked 52 to the stone marked 79. How far has the cyclist traveled?

- Ans**
- ☒ A. 52 kilometers
 - ☒ B. 31 kilometers
 - ☒ C. 131 kilometers
 - ☒ D. 27 kilometers

Q.33 A dealer buys a table for ₹2,750. He first marks it up by 28%, then allows a 12% discount to a customer. If the customer also pays 5% GST on the selling price, find the profit percentage (excluding GST) made by the dealer.

- Ans**
- ☒ A. 15.12%
 - ☒ B. 10.36%
 - ☒ C. 13.81%
 - ☒ D. 12.64%

Q.34 Select the pair which follows the same pattern as that followed by the two pairs given below. Both pairs follow the same pattern.

ZOT - TLP
NIL - HFH

- Ans**
- ☒ A. BCD - VZZ
 - ☒ B. BOC - VZT
 - ☒ C. VZZ - BCD
 - ☒ D. ABD - VZZ

Q.35 A boy uses a wheelbarrow to carry sand. The wheel acts as the pivot, the sand is placed in the tray, and the boy lifts the handles. In this arrangement, the sand represents _____.

- Ans**
- ☒ A. Load
 - ☒ B. Arm
 - ☒ C. Fulcrum
 - ☒ D. Effort

Q.36 Srinu starts from his home and drives 2 km towards the south, then takes a right turn and drives 5 km. He then takes a right turn and drives 6 km before taking a right turn again and driving 4 km further. Srinu finally takes a right turn and drives 4 km before stopping at his office. In which direction should Srinu drive to reach his home again? (All turns are 90-degree turns only unless specified.)

- Ans**
- ☒ A. West
 - ☒ B. South
 - ☒ C. East
 - ☒ D. North

Q.37 What is the primary color used in warning signs to alert workers of potential hazards?

- Ans**
- ☒ A. Blue with white symbol or text
 - ☒ B. Yellow with black symbol or text
 - ☒ C. Red with white symbol or text
 - ☒ D. Green with white symbol or text

Q.38 An astronaut weighs 600 N on Earth. During a moon mission, she performs an experiment to measure her weight on the moon. Which value is closest to her expected weight on the moon, and why?

- Ans**
- ☒ A. 200 N, because the Moon's gravity is about one-third of Earth's.
 - ☒ B. 100 N, because the Moon's gravity is about one-sixth of Earth's.
 - ☒ C. 600 N, because a person's weight remains unchanged on the Moon.
 - ☒ D. 300 N, because the Moon's gravity is about one-half of Earth's.

Q.39 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 to/subtracting from/multiplying with 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed.)

6 – 16 – 23 – 32; 7 – 19 – 26 – 35

- Ans**
- ☒ A. 12 – 34 – 41 – 50
 - ☒ B. 4 – 14 – 21 – 30
 - ☒ C. 8 – 22 – 15 – 24
 - ☒ D. 11 – 31 – 38 – 29

Q.40 What should come in place of the question mark (?) in the given series?

1 2 7 20 61 ?

- Ans**
- ☒ A. 183
 - ☒ B. 185
 - ☒ C. 181
 - ☒ D. 182

Q.41 A laboratory thermometer has a range from -10 degrees Celsius to 110 degrees Celsius and 120 equal divisions. What is the smallest value that this thermometer can read?

- Ans**
- ☒ A. 2 degrees Celsius
 - ☒ B. 10 degrees Celsius
 - ☒ C. 0.5 degrees Celsius
 - ☒ D. 1 degree Celsius

Q.42 Why are electric wires in household appliances usually covered with plastic or rubber coating?

- Ans**
- ☒ A. To prevent electric shocks by insulation
 - ☒ B. To make the wires heavier
 - ☒ C. To increase the flow of current
 - ☒ D. To produce more heat

Q.43 Which of the following best describes the function of a speedometer in a vehicle?

- Ans**
- ☒ A. It displays the current speed at which the vehicle is moving.
 - ☒ B. It calculates the average speed over a journey.
 - ☒ C. It measures the total distance the vehicle has traveled.
 - ☒ D. It shows the rate at which the vehicle's speed changes.

Q.44 What should come in place of '?' in the given series?
11, 22, 44, 88, 176, ?

- Ans**
- ☒ A. 352
 - ☐ B. 356
 - ☐ C. 342
 - ☐ D. 358

Q.45 A car travels from point A to point B in a zigzag path, covering a total distance of 200 meters. If the shortest straight-line distance between A and B is 120 meters, which statement best describes the car's distance and displacement?

- Ans**
- ☐ A. The distance is 120 meters; the displacement is 120 meters
 - ☐ B. The distance is 120 meters; the displacement is 200 meters
 - ☒ C. The distance is 200 meters; the displacement is 120 meters
 - ☐ D. The distance is 200 meters; the displacement is 200 meters

Q.46 What should come in place of the question mark (?) in the given series based on the English alphabetical order?

MDB PHE SLH VPK ?

- Ans**
- ☐ A. ZUO
 - ☐ B. XSM
 - ☐ C. ZTM
 - ☒ D. YTN

Q.47 Two trains are moving in opposite directions. The first train is 120 m long and runs at 54 km/h. The second train is 180 m long and runs at 72 km/h. How much time will they take to cross each other completely?
(Rounded up to two decimal places)

- Ans**
- ☐ A. 7.57 seconds
 - ☐ B. 8.43 seconds
 - ☐ C. 9.25 seconds
 - ☒ D. 8.57 seconds

Q.48 Let C be a circle, and AB and DE be two chords on C such that AB = BE. In the quadrilateral ABED, let AE and BD intersect at F, $\angle DBE = 55^\circ$ and $\angle BAE = 40^\circ$. Find $\angle FED$.

- Ans**
- ☒ A. 45°
 - ☐ B. 55°
 - ☐ C. 60°
 - ☐ D. 110°

Q.49 What will come in place of the question mark (?) in the following equation if '+' and '-' are interchanged and 'x' and '÷' are interchanged?
 $42 \times 6 \div 7 - 35 + 19 = ?$

- Ans**
- ☒ A. 65
 - ☐ B. 67
 - ☐ C. 63
 - ☐ D. 69

Q.50 A cyclist rides 60 meters north, then 80 meters south, and finally 70 meters north. What is the total distance the cyclist has traveled?

- Ans**
- ☐ A. 60 meters
 - ☐ B. 150 meters
 - ☒ C. 210 meters
 - ☐ D. 10 meters

Q.51 Which statement best describes the side view in engineering drawing?

- Ans**
- ☐ A. It shows a combination of all views of the object
 - ☐ B. It shows the object as seen clearly from the front
 - ☒ C. It shows the object as seen from left or right side
 - ☐ D. It shows the object as seen from above or below

Q.52 An article is bought for ₹300 and its price is increased by 5.5%. The resulting price is then reduced by 8%. Find the final selling price.

- Ans**
- ☐ A. ₹284.45
 - ☐ B. ₹296.46
 - ☒ C. ₹291.18
 - ☐ D. ₹288.24

Q.53 A solid right circular cone is 7 cm high, and the radius of its base is 22.2 cm. It is melted and recast into a right circular cone with radius of its base 3.7 cm. Then the height (in cm) of the cone is _____.

- Ans**
- ☐ A. 185
 - ☐ B. 267
 - ☒ C. 252
 - ☐ D. 159

Q.54 The price of sugar is increased by 20%. Manoj can increase his expenditure on sugar by only 15% from his income. In order to balance his expenditure, by what percentage should he reduce the quantity of sugar consumed?

- Ans**
- ☐ A. 6.5%
 - ☐ B. 5%
 - ☒ C. $4\frac{1}{6}\%$
 - ☐ D. $5\frac{1}{3}\%$

Q.55 12 is related to 1730 following a certain logic. Following the same logic, 13 is related to 2199. To which of the given options is 11 related, following the same logic?
(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 etc. to 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed.)

- Ans**
- ☐ A. 1443
 - ☒ B. 1333
 - ☐ C. 1433
 - ☐ D. 1543

Q.56 What is the primary role of the Central Processing Unit (CPU) in a computer system?

- Ans**
- ☐ A. To display output on the screen
 - ☐ B. To store long-term data
 - ☐ C. To manage network connections
 - ☒ D. To execute program instructions

Q.57 Which statement best describes the front view in an engineering drawing?

- Ans**
- ☐ A. It shows the object's depth and height as seen from the side
 - ☒ B. It shows the object's height and width as seen from the front
 - ☐ C. It shows only the object's bottom or right side
 - ☐ D. It shows only one dimension of the object

Q.58 If 2 is subtracted from each odd digit and 2 is added to each even digit in the number 235234796423, what will be the sum of the digits that are third from the left and third from the right?

- Ans**
- ☒ A. 7
 - ☒ B. 9
 - ☒ C. 6
 - ☒ D. 8

Q.59 The salary of a person is increased by 10%, 20% and 25% successively in three consecutive years. Find the overall percentage increase in the salary at the end of the third year.

- Ans**
- ☒ A. 50%
 - ☒ B. 30%
 - ☒ C. 65%
 - ☒ D. 60%

Q.60 Refer to the given letter series and answer the question that follows. Counting to be done from left to right only.

(Left) H S A N D D I A D F P A J O S K I O Z O T X (Right)

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

- Ans**
- ☒ A. Four
 - ☒ B. Three
 - ☒ C. Six
 - ☒ D. Five

Q.61 An engineer is updating a schematic for a control panel and needs to indicate a normally closed push button. Which approach best ensures the symbol is universally understood among engineers referring to standard engineering drawings?

- Ans**
- ☒ A. Substitute the normally closed push button symbol with a general switch symbol
 - ☒ B. Describe the normally closed push button in words within the schematic diagram clearly
 - ☒ C. Draw a hand made representation of the push button with a note explaining function
 - ☒ D. Use the standardized symbol for a normally closed push button as per conventions

Q.62 Seven boxes S, T, U, V, W, X, and Y are kept one over the other but not necessarily in the same order. U is kept exactly third from the top. Only one box is kept between U and T. W is kept immediately above T. Only three boxes are kept between X and S. V is kept on one of the positions below Y. Only two boxes are kept between U and S. Which box is kept second from the top?

- Ans**
- ☒ A. U
 - ☒ B. V
 - ☒ C. X
 - ☒ D. T

Q.63 Which symbol best represents a battery in an electric circuit diagram according to standard conventions?

- Ans**
- ☒ A. A pair of long and short parallel lines placed alternately
 - ☒ B. A single long line only
 - ☒ C. Two circles connected in series
 - ☒ D. Two short lines placed together

Q.64 A group of numbers/symbols is coded using letter codes as per the codes given below and the conditions that follow. The correct combination of codes following the conditions is your answer.

Note: If none of the conditions follow, then the codes for the respective number/symbol are to be followed directly as given in the table.

Number/symbol	3	@	8	4	\$	&	2	%	#	1	+	9	7	5
Code	U	G	B	K	M	F	X	R	E	Q	S	C	V	T

Conditions –

- (i) If the first element is a symbol and the last element an odd number, the codes for these two (the first and the last elements) are to be interchanged.
- (ii) If the first element is an odd number and the last an even number, the first and the last elements are to be coded as ©
- (iii) If both second and third elements are perfect squares, the third element is to be coded as the code for the second element.

What will be the code for the following group?

& 8 \$ 9 5

- Ans**
- ☒ A. FCBMT
 - ☒ B. TBMCF
 - ☒ C. FBMCT
 - ☒ D. TCMBF

Q.65 Which of the following statements best describes a cuboid as used in engineering drawing?

- Ans**
- ☒ A. A cuboid has all sides and angles equal, making it similar to a cube.
 - ☒ B. A cuboid is a solid with six rectangular faces, and opposite faces are equal.
 - ☒ C. A cuboid has all faces as squares of equal size.
 - ☒ D. A cuboid is a solid where all faces are parallelograms but not necessarily rectangles.

Q.66 Pipes A and B can fill an entire tank in 8 hours and 12 hours, respectively. The water tank is one-fourth full. If both the pipes are opened together, then how long will it take to fill the remaining part of the tank?

- Ans**
- ☒ A. 3 hours 6 minutes
 - ☒ B. 3 hours 26 minutes
 - ☒ C. 3 hours 16 minutes
 - ☒ D. 3 hours 36 minutes

Q.67 A plane parallel to the base divides a cone of height 40 cm into two parts. If the volume of the upper smaller cone formed is $\frac{1}{64}$ of the volume of the original cone, calculate the height of the plane from the base of the cone.

- Ans**
- ☒ A. 20 cm
 - ☒ B. 40 cm
 - ☒ C. 10 cm
 - ☒ D. 30 cm

Q.68 A technician needs to select a fuse wire for a room heater. Which property should be considered most important for safety based on the heating effect of electric current?

- Ans**
- ☒ A. The fuse wire must have high resistance and be thick to prevent melting.
 - ☒ B. The fuse wire must have a high melting point for durability.
 - ☒ C. The fuse wire must have a low melting point to break the circuit during excess current.
 - ☒ D. The fuse wire must have a shiny surface for efficient cooling.

Q.69 A crane lifts a 200 kg load to a height of 15 meters in 10 seconds. Assuming acceleration due to gravity is 10 m/s^2 and energy loss is negligible, what is the power output of the crane during this operation?

- Ans**
- ☒ A. 2000 W
 - ☒ B. 1000 W
 - ☒ C. 3000 W
 - ☒ D. 1500 W

Q.70 Sohan covers a total distance of 760 km to reach his home, traveling partly by train and partly by car. He takes 8 hours when he travels 160 km by train and the rest by car. If he travels 240 km by train and the remaining distance by car, his journey takes 12 minutes longer. Find the difference between the speeds of the train and the car.

- Ans**
- ☒ A. 20 km/h
 - ☒ B. 23 km/h
 - ☒ C. 27 km/h
 - ☒ D. 21 km/h

Q.71 A pump can fill a tank in 3 hours. Due to a leak in the tank, it takes 4.5 hours to fill the tank. In how much time can the leak empty the full tank if no other entry or exit routes are open?

- Ans**
- ☒ A. 8 hours
 - ☒ B. 6 hours
 - ☒ C. 7 hours
 - ☒ D. 9 hours

Q.72 Which color is universally associated with emergency exit signs in industrial workplaces under international standards?

- Ans**
- ☒ A. Yellow background with black text or symbols
 - ☒ B. Blue background with white text or symbols
 - ☒ C. Red background with white text or symbols
 - ☒ D. Green background with white text or symbols

Q.73 Why does restricting certain chemical refrigerants effectively reduce damage to the ozone layer?

- Ans**
- ☒ A. Refrigerants contain particles that absorb harmful UV light.
 - ☒ B. Refrigerants increase oxygen production, supporting ozone recovery.
 - ☒ C. Refrigerants emit greenhouse gases that warm the stratosphere.
 - ☒ D. Refrigerants release substances that catalyze ozone breakdown.

Q.74 Which of the following pairs of numbers is co-prime?

- Ans**
- ☒ A. (17, 54)
 - ☒ B. (28, 49)
 - ☒ C. (14, 28)
 - ☒ D. (21, 33)

Q.75 When drawing repeated 67° angles on an engineering sheet, which practice best helps minimize cumulative alignment errors?

- Ans**
- ☒ A. Relying solely on the initial protractor alignment for all angles
 - ☒ B. Using the same reference line for all repeated angles
 - ☒ C. Drawing all angles continuously without intermediate verification
 - ☒ D. Marking all angles lightly with a pencil before finalizing

Q.76 Why is a room thermometer generally mounted vertically on a wall?

- Ans**
- ☐ A. It prevents the liquid from freezing inside the thermometer.
 - ☐ B. It helps the thermometer measure body temperature faster.
 - ☒ C. It ensures accurate reading by keeping the bulb exposed to room air.
 - ☐ D. It protects the thermometer from breaking easily.

Q.77 The first shopkeeper allows two successive discounts of 3% and 7%, while a second shopkeeper allows two successive discounts of 2% and 8%. A third shopkeeper allows 10% discount on the same item. From which shopkeeper should a customer buy if the marked price is the same at the three shops?

- Ans**
- ☒ A. Buy from the third shopkeeper
 - ☐ B. Buy from the second shopkeeper
 - ☐ C. Buy from the first or the second shopkeeper as both are the same.
 - ☐ D. Buy from the first shopkeeper

Q.78 Which combination best describes the main environmental challenges associated with plastic waste management?

- Ans**
- ☒ A. Persistence in the environment and microplastic formation
 - ☐ B. Neutralization and easy recycling
 - ☐ C. Thermal pollution and effective composting
 - ☐ D. Rapid biodegradation and chemical leaching

Q.79 What information does a kilometer stone provide to travelers on a road?

- Ans**
- ☐ A. Direction of travel
 - ☒ B. Distance from a reference point
 - ☐ C. Time taken to reach destination
 - ☐ D. Speed of the vehicle

Q.80 SANZ is related to YUTT in a certain way based on the English alphabetical order. In the same way, MTHM is related to SNNG. To which of the following is LJRE related to following the same logic?

- Ans**
- ☐ A. QDYY
 - ☐ B. REXZ
 - ☐ C. QEYZ
 - ☒ D. RDXV

Q.81 Which of the following letter-number clusters will replace the question mark (?) in the given series to make it logically complete?

GXM 5, JVN 11, MTO 24, PRP 51, ?

- Ans**
- ☐ A. TPQ 106
 - ☐ B. SPQ 107
 - ☐ C. TPQ 107
 - ☒ D. SPQ 106

Q.82 The mean of 11 numbers is 10.9. If the mean of the first 6 numbers is 10.5 and the mean of the last 6 numbers is 11.4, then find the 6th number.

- Ans**
- ☐ A. 11
 - ☒ B. 11.5
 - ☐ C. 10
 - ☐ D. 10.5

Q.83 Five students, N, O, R, S and T, have different heights. T is taller than N. R is taller than S but shorter than O. S is taller than N. More than two people are taller than T. How many people are shorter than R?

- Ans**
- ☐ A. One
 - ☐ B. None
 - ☐ C. Two
 - ☒ D. Three

Q.84 Which tool safety measure best prevents injuries when cleaning a workshop lathe after use?

- Ans**
- ☒ A. Using a brush to remove metal chips from the lathe
 - ☐ B. Blowing chips away with compressed air around the lathe
 - ☐ C. Using a rag to remove metal dust from the lathe
 - ☐ D. Wiping metal chips using bare hands directly

Q.85 Read the given statement(s) and conclusions carefully. Assuming that the information given in the statement(s) 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 statement(s).

Statements:

All chocolates are paneers.
No paneer is a milk.

Conclusions:

(I) No chocolate is a milk.
(II) Some milks are paneers.

- Ans**
- ☐ A. Neither conclusion (I) nor (II) follows.
 - ☐ B. Only conclusion (II) follows.
 - ☐ C. Both conclusions (I) and (II) follow.
 - ☒ D. Only conclusion (I) follows.

Q.86 If $3x - 2y + 3z = 8$, $4x - 3y + 2z = 4$ and $2x + y - z = 1$, then find x, y and z, respectively.

- Ans**
- ☐ A. 2, 1 and 3
 - ☐ B. 3, 1 and 2
 - ☒ C. 1, 2 and 3
 - ☐ D. 2, 3 and 1

Q.87 Read the given statement(s) 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 statement(s).

Statements:

Some rugs are fans.
No fan is a car.

Conclusion (I) : Some rugs are cars.
Conclusion (II) : Some fans are rugs.

- Ans**
- ☐ A. Both conclusions (I) and (II) follow
 - ☐ B. Only conclusion (I) follows
 - ☐ C. Neither conclusion (I) nor (II) follows
 - ☒ D. Only conclusion (II) follows

Q.88 The cost of a diamond varies directly with the square of its weight. A diamond broke into four pieces with weights in the ratio 2:4:1:3. If it had been broken into four equal pieces, the loss would have been ₹60,000. What was the original cost of the diamond?

- Ans**
- ☒ A. ₹80,000
 - ☐ B. ₹75,000
 - ☐ C. ₹82,000
 - ☐ D. ₹78,000

Q.89 A question is followed by two statements numbered (I) and (II). You have to decide whether the data provided in the statements are sufficient to answer the question. Read both the statements and select the most appropriate answer.

Question:

Among five trees N, O, R, S, and T, each having a different height, which tree is the tallest?

Statements:

(I) T is taller than R. N is taller than T.

(II) R is shorter than O but taller than S.

- Ans**
- ☐ A. Data in Statement II alone is sufficient to answer the question while data in statement I is not
 - ☒ B. Both statements I and II together are NOT sufficient to answer the question
 - ☐ C. Both statements I and II together (and not statement I alone or statement II alone) are sufficient to answer the question
 - ☐ D. Data in Statement I alone is sufficient to answer the question while data in statement II is not

Q.90 P, Q and R are three batsmen. The ratios of runs scored by them in a certain match were as follows:

$P : Q = 5 : 7$ and $Q : R = 2 : 3$.

If they scored a total of 765 runs, then find the number of runs scored by R.

- Ans**
- ☐ A. 350
 - ☒ B. 357
 - ☐ C. 378
 - ☐ D. 336

Q.91 If $x + \frac{1}{x} = 5$, then $\frac{x^3 - 5x^2 + 5x}{x^2 + 1}$ is equal to:

- Ans**
- ☐ A. $\frac{1}{5}$
 - ☐ B. $\frac{2}{5}$
 - ☐ C. $\frac{3}{5}$
 - ☒ D. $\frac{4}{5}$

Q.92 Which one of the following statements correctly describes a characteristic of WANs?

- Ans**
- ☐ A. WANs are limited to connecting devices within a radius of 1 to 2 km.
 - ☐ B. WANs are always public networks managed solely by Internet Service Providers (ISPs).
 - ☒ C. WANs can be built by connecting multiple LANs via wired or wireless links.
 - ☐ D. WANs typically use only wireless media to connect distant LANs.

Q.93 A cyclist travels 120 km in 3 hours, rests for 1 hour, and then travels another 80 km in 2 hours. To determine the cyclist's average speed for the entire journey, which of the following quantities should be used?

- Ans**
- ☒ A. Distance travelled in a particular direction divided by time
 - ☒ B. Total distance travelled divided by the total time taken
 - ☒ C. Total displacement divided by total time taken
 - ☒ D. Change in velocity divided by total time taken

Q.94 What is the primary purpose of a Local Area Network (LAN)?

- Ans**
- ☒ A. To link wireless devices only
 - ☒ B. To connect social media accounts
 - ☒ C. To connect computers within a small geographical area
 - ☒ D. To connect global networks

Q.95 G is the mother of Y. Y is the sister of V. S is the father of L. L is the son of V. How is G related to L?

- Ans**
- ☒ A. Mother's sister
 - ☒ B. Mother's mother
 - ☒ C. Mother
 - ☒ D. Sister

Q.96 When a cutting plane line passes through a hole and a rib, which feature should be sectioned in the resulting view according to standard conventions?

- Ans**
- ☒ A. Both the hole and the rib are shown unsectioned
 - ☒ B. The hole is sectioned but the rib is shown unsectioned
 - ☒ C. Both the hole and the rib are shown sectioned
 - ☒ D. The rib is sectioned but the hole is left unsectioned

Q.97 Find the compound interest on ₹5,70,000 for 1.5 years at 10% per annum compounded half-yearly.

- Ans**
- ☒ A. ₹88,846.25
 - ☒ B. ₹89,946.25
 - ☒ C. ₹92,846.25
 - ☒ D. ₹89,846.25

Q.98 A 42-litre solution has sugar and water in the ratio 2 : 5. If, due to evaporation, the volume is reduced by 35%, and only water evaporates, what is the new ratio of sugar to water?

- Ans**
- ☒ A. 40 : 51
 - ☒ B. 51 : 42
 - ☒ C. 31 : 50
 - ☒ D. 40 : 41

Q.99 Refer to the following letter series and answer the question that follows. (Counting to be done from left to right only.)

(Left) Q K Q N X K G G V M L A W T W K N G V (Right)

How many such consonants are there each of which is immediately preceded by a vowel and also immediately followed by a consonant?

- Ans**
- ☒ A. None
 - ☒ B. Two
 - ☒ C. One
 - ☒ D. Three

Q.100 A sum of money invested at simple interest amounts to ₹21,500 in 5 years and ₹26,000 in 8 years. Find the principal amount (in ₹).

- Ans**
- ☐ A. 15,500
 - ☒ B. 14,000
 - ☐ C. 12,000
 - ☐ D. 7,500

Section : **PART-B**

Q.1 Why is a flywheel essential for starting a diesel engine equipped with a manual transmission?

- Ans**
- ☒ A. It provides inertia for easier engine rotation during cranking
 - ☐ B. It supplies electrical current to the glow plugs
 - ☐ C. It generates fuel pressure for the injectors
 - ☐ D. It cools the engine oil during initial cycles

Q.2 What happens to the boiling point of coolant when the pressure inside the cooling system increases?

- Ans**
- ☐ A. The boiling point of coolant fluctuates
 - ☐ B. The boiling point of coolant decreases
 - ☐ C. The boiling point of coolant remains unchanged
 - ☒ D. The boiling point of coolant increases

Q.3 How does the use of nylon or rayon cords contribute to the reduction of hysteresis in tyres?

- Ans**
- ☐ A. They make the tyre rigid and stiff
 - ☒ B. They provide flexibility and recover quickly
 - ☐ C. They reduce the tread's grip on wet roads
 - ☐ D. They increase the overall tyre weight

Q.4 Why is it important to use insulated tools when servicing hybrid electric vehicles?

- Ans**
- ☒ A. To prevent accidental electric shock
 - ☐ B. To reduce the weight of tools
 - ☐ C. To prevent oil spills in engine bay
 - ☐ D. To avoid scratching metal parts

Q.5 When connecting phase windings in a star configuration, what is formed at the common point?

- Ans**
- ☐ A. A positive terminal is formed at the common point
 - ☐ B. A disruptive ground loop shared at one connection
 - ☐ C. A negative terminal is formed at the common point
 - ☒ D. A neutral terminal is formed at the common point

Q.6 During which engine operating condition does the alternator supply maximum current to the battery?

- Ans**
- ☐ A. When the engine is off
 - ☐ B. At engine idle only
 - ☐ C. During engine starting
 - ☒ D. At higher engine speeds

Q.7 Which of these is the best footwear for personal safety in an automotive workshop?

- Ans**
- ☒ A. Steel-toed shoes
 - ☐ B. Sandals
 - ☐ C. Rubber slippers
 - ☐ D. Canvas shoes

Q.8 If the length of a conductor is doubled while keeping other factors constant, its resistance will:

- Ans**
- ☐ A. Become zero
 - ☐ B. Become half
 - ☐ C. Remain unchanged
 - ☒ D. Double

Q.9 What is the role of eddy currents in an electromagnetic retarder?

- Ans**
- ☐ A. To create magnetic drag through direct physical contact
 - ☐ B. To generate thermal energy to lock the vehicle brakes
 - ☐ C. To maintain a stationary magnetic field in the stator
 - ☒ D. To create magnetic drag without physical contact

Q.10 In an automobile alternator, if one rectifier diode becomes open-circuited, what is the most likely effect on battery charging?

- Ans**
- ☒ A. Battery charging current reduces and AC ripple increases.
 - ☐ B. Battery receives smooth DC charging with no change in output.
 - ☐ C. Alternator produces only AC output without any mechanical effect.
 - ☐ D. Ignition system voltage becomes fully stabilized automatically.

Q.11 What movement does the shackle perform when the vehicle passes over a bump or ditch?

- Ans**
- ☐ A. It moves vertically to support the axle
 - ☐ B. It moves forward to accommodate the spring's elongation
 - ☐ C. It stays fixed in one position to accommodate the spring's elongation
 - ☒ D. It moves backward to accommodate the spring's elongation

Q.12 Which of the following is a likely cause of low engine power output?

- Ans**
- ☐ A. Low oil level in the sump
 - ☐ B. Engine oil low viscosity
 - ☐ C. Engine oil high viscosity
 - ☒ D. Defective injector

Q.13 Why does an automatic transmission vehicle require a torque converter in stop-and-go driving situations?

- Ans**
- ☐ A. Directly locks the engine to the wheels
 - ☒ B. Smooth engine power transmission at low speed
 - ☐ C. Increases the braking force during stops
 - ☐ D. Eliminates the need for transmission fluid

Q.14 What should be checked before using a divider to ensure accuracy in workshop practice?

- Ans**
- ☐ A. The surface finish is shiny
 - ☒ B. Both legs are of equal length
 - ☐ C. The color of the divider
 - ☐ D. The divider is heavy

Q.15 Which component in the EFI wiring system is responsible for effective atomization characteristics during cold starting condition?

- Ans**
- ☒ A. Cold start valve
 - ☐ B. Air flow sensor
 - ☐ C. Fuel regulator
 - ☐ D. Spiral coil spring

Q.16 A lathe machine performs work at a constant rate. What does this indicate about its power output?

- Ans**
- ☒ A. The power output is constant
 - ☐ B. The power output is increasing
 - ☐ C. The power output is zero
 - ☐ D. The power output is decreasing

Q.17 How does the condenser assist the ignition coil after the contact breaker points separate?

- Ans**
- ☒ A. It enables the high voltage surge through the secondary winding
 - ☐ B. It triggers the spark plug to fire directly
 - ☐ C. It slows down the current in the primary circuit
 - ☐ D. It enables the high voltage surge through the primary winding

Q.18 A student hypothesizes that using ethanol-blended gasoline requires a different stoichiometric air–fuel ratio than pure gasoline. Which consideration supports this claim?

- Ans**
- ☒ A. Oxygen content in fuel blend
 - ☐ B. Octane rating of the fuel
 - ☐ C. Evaporation rate of fuel
 - ☐ D. Color of gasoline blend

Q.19 Why is the vernier scale constructed with divisions slightly different from those on the main scale in a vernier caliper?

- Ans**
- ☐ A. To make the vernier scale divisions identical to the main scale divisions.
 - ☐ B. To ensure the vernier scale is always smaller than the main scale.
 - ☒ C. To allow precise matching of a vernier division with a main scale division at specific points.
 - ☐ D. To make the vernier scale divisions twice as large as the main scale divisions.

Q.20 During a workshop repair, which sign would suggest a failed gasket in a manual transmission case?

- Ans**
- ☐ A. Unusual noise coming from inside the case
 - ☒ B. Visible fluid seeping from between the case and cover plate
 - ☐ C. Vibration felt during gear changes
 - ☐ D. Difficulty shifting between gears

Q.21 What could be a consequence of operating a diesel engine without a functioning vibration damper?

- Ans**
- ☐ A. Stable camshaft timing at all speeds
 - ☐ B. Improved fuel atomization in injectors
 - ☒ C. Crankshaft failure due to excessive stress
 - ☐ D. Increased combustion efficiency under load

Q.22 What does a simple zig-zag line typically symbolize in automobile engineering drawings?

- Ans**
- ☒ A. A resistor in a circuit
 - ☐ B. A fuse in a circuit
 - ☐ C. A horn in a circuit
 - ☐ D. A bulb in a circuit

Q.23 If a technician is asked to estimate the distance a vehicle can travel after a full recharge or refuel, what is the term used to describe this value?

- Ans**
- ☐ A. Fuel economy
 - ☐ B. Charge time
 - ☒ C. Driving range
 - ☐ D. Horsepower

Q.24 Which component in an electric vehicle stores electrical energy for propulsion?

- Ans**
- ☐ A. Alternator unit
 - ☒ B. Battery pack
 - ☐ C. Carburetor set
 - ☐ D. Fuel tank set

Q.25 Why are gear ratios arranged in a specific sequence in manual transmissions?

- Ans**
- ☐ A. To reduce the vehicle's fuel tank capacity
 - ☒ B. To provide smooth acceleration and efficient speed control
 - ☐ C. To confuse the driver while shifting gears
 - ☐ D. To maximize engine noise at all speeds

Q.26 What is the main function of the anvil in the construction of a micrometer?

- Ans**
- ☒ A. Provides a stationary measuring surface
 - ☐ B. Displays the main scale reading
 - ☐ C. Rotates the spindle
 - ☐ D. Adjusts the measuring pressure

Q.27 Why must the starter motor disengage from the flywheel after the engine starts?

- Ans**
- ☐ A. To increase battery life during operation
 - ☐ B. To improve fuel efficiency during driving
 - ☒ C. To prevent damage to the starter and flywheel
 - ☐ D. To adjust ignition timing automatically

Q.28 Which signal is used to indicate special movement instructions for emergency vehicles at an intersection?

- Ans**
- ☐ A. A flashing red signal is used for emergency vehicles
 - ☐ B. A flashing green signal is used for emergency vehicles
 - ☒ C. A flashing blue signal is used for emergency vehicles
 - ☐ D. A flashing yellow signal is used for emergency vehicles

Q.29 How does an electronic fuel injection (EFI) system protect an overspeeding engine using fuel?

- Ans**
- ☐ A. Lowers fuel pump voltage
 - ☐ B. Causes immediate acceleration
 - ☐ C. Accelerates combustion
 - ☒ D. Temporarily cuts fuel injection

Q.30 Internal combustion engines offer which advantage in terms of start-up?

- Ans**
- ☒ A. Internal combustion engines have slow start-up time
 - ☒ B. Internal combustion engines have quick start-up time
 - ☒ C. Internal combustion engines start without a compression process
 - ☒ D. Internal combustion engines start without cranking

Q.31 What is the primary purpose of gasoline's volatility in a motor vehicle fuel system?

- Ans**
- ☒ A. To increase the octane rating directly
 - ☒ B. To ensure rapid vaporization for ignition
 - ☒ C. To reduce exhaust emissions automatically
 - ☒ D. To prevent corrosion of metal parts

Q.32 What is a key reason for selecting carbon fiber reinforced carbon composite for racing car brake pads?

- Ans**
- ☒ A. It is more fuel efficient than other materials
 - ☒ B. It can handle extreme pressures without failing
 - ☒ C. It is more cost-effective than all metals
 - ☒ D. It can handle extreme temperatures without failing

Q.33 Which part works closely with actuators to ensure correct fuel injection?

- Ans**
- ☒ A. Air filter assembly
 - ☒ B. Electronic Control Unit (ECU)
 - ☒ C. Radiator fan blade
 - ☒ D. Gear lever handle

Q.34 Which tool is commonly used to tighten cylinder head bolts during diesel engine assembly?

- Ans**
- ☒ A. Combination spanner is used for cylinder head bolts
 - ☒ B. Torque wrench is used to tighten cylinder head bolts
 - ☒ C. Adjustable wrench is best for all types of bolt tightening
 - ☒ D. Soft mallet is ideal for tightening cylinder head bolts

Q.35 Which scenario best describes zero work being done?

- Ans**
- ☒ A. Pulling a rope to lift a load
 - ☒ B. Pushing a trolley across the floor
 - ☒ C. Holding a suspended weight without moving it
 - ☒ D. Lifting a box onto a table

Q.36 On an engineering drawing, what does a circle with two parallel lines inside typically indicate?

- Ans**
- ☒ A. A fuse
 - ☒ B. A junction box
 - ☒ C. A ground connection
 - ☒ D. A ball bearing

Q.37 Which of the following best describes the driver's experience in a four-wheel steering vehicle during a sharp turn?

- Ans**
- ☒ A. Less effort is needed to steer sharply
 - ☒ B. Movement becomes unstable during sharp turns
 - ☒ C. Response to steering input is delayed
 - ☒ D. More effort is required to initiate a turn

Q.38 Which is the lightest among the following commonly used workshop materials?

- Ans**
- ☐ A. Steel rod
 - ☐ B. Iron rod
 - ☐ C. Copper rod
 - ☒ D. Aluminum rod

Q.39 What is a practical effect of using helical gears in a vehicle's steering mechanism?

- Ans**
- ☐ A. Steering feels harder and has less vibration
 - ☐ B. Steering transmits less force to the wheels
 - ☐ C. Steering becomes harder to turn
 - ☒ D. Steering feels smoother and has less vibration

Q.40 What should be done if oil is mixed with water in oil sump and the engine does not start?

- Ans**
- ☐ A. Repair the pitted valve seat
 - ☐ B. Clean the exhaust ports
 - ☒ C. Replace ruptured cylinder head gasket
 - ☐ D. Replace cracked valve seat

Q.41 Which of the following component is most likely worn or failed if there is excessive lateral chassis movement in a rigid non drive rear suspension?

- Ans**
- ☐ A. Upper control arm
 - ☐ B. Shock absorber
 - ☐ C. Coil spring
 - ☒ D. Tracking bar

Q.42 What feature can be changed in a manual adjustable-rate shock absorber to control oil flow?

- Ans**
- ☐ A. The size of the spring inside
 - ☐ B. The shape of the piston head
 - ☒ C. The position of the valves in the piston
 - ☐ D. The amount of oil used

Q.43 Which part of the charging system detects changes in battery voltage and adjusts output accordingly?

- Ans**
- ☐ A. Fuse box
 - ☐ B. Starter motor
 - ☐ C. Ignition coil
 - ☒ D. Regulator unit

Q.44 A vehicle's thermostat is working erratically, leading to overheating. What should be done?

- Ans**
- ☐ A. Repair thermostat
 - ☒ B. Replace thermostat
 - ☐ C. Replace water pump
 - ☐ D. Open radiator shutter

Q.45 Which piston pin arrangement normally requires thrust washers least often?

- Ans**
- ☐ A. Semi-floating clamped rod type
 - ☐ B. Taper pin type
 - ☒ C. Fully floating with circlips
 - ☐ D. Fixed pin type

Q.46 What does a typical immobilizer system use to verify authorized access?

- Ans**
- ☐ A. Engine oil dipstick
 - ☐ B. Standard metal ignition key
 - ☐ C. Manual window crank handle
 - ☒ D. Coded electronic key or fob

Q.47 Which step is essential before using an inch tap to obtain the correct internal thread size?

- Ans**
- ☐ A. Mark the center with a prick punch
 - ☐ B. Apply lubricant to the tap before use
 - ☐ C. Use a die to test the tap size
 - ☒ D. Drill a hole of correct size for the tap

Q.48 During a precision tapping job, an operator notices the tap slipping within the wrench. Which corrective action should be taken to resolve this using an adjustable tap wrench?

- Ans**
- ☐ A. Apply greater force while turning the tap
 - ☒ B. Retighten the jaws to secure the tap firmly in the wrench
 - ☐ C. Switch to a fixed tap wrench for the operation
 - ☐ D. Replace the tap with a new one of the same size

Q.49 If the length of the insulator nose is long, what is the direct effect on the spark plug heat range?

- Ans**
- ☒ A. The plug will run hotter
 - ☐ B. The plug will foul easily
 - ☐ C. The plug will run cooler
 - ☐ D. The plug will transfer heat faster

Q.50 Which component of vehicle exhaust is most closely linked to hydrocarbon emissions?

- Ans**
- ☐ A. Carbon monoxide
 - ☒ B. Unburned fuel vapors
 - ☐ C. Nitrogen oxides
 - ☐ D. Excess water vapor

Q.51 Which feature distinguishes a heavy load vehicle from a light load vehicle?

- Ans**
- ☒ A. High payload capacity
 - ☐ B. Steering wheel
 - ☐ C. Aerodynamic shape
 - ☐ D. Headlights

Q.52 A hydraulic system is designed to lift heavy loads but requires fluid to flow in only one direction to prevent backflow. Which application most appropriately uses a non-return valve?

- Ans**
- ☐ A. Mounting a non return valve in a control valve line for flow regulation
 - ☐ B. Placing a non return valve in the system inlet line to enhance pressure
 - ☒ C. Inserting a non return valve in the pump discharge line to stop reverse fluid flow
 - ☐ D. Fitting a non return valve in the reservoir return line for fluid direction

Q.53 Which device in a clean diesel exhaust system is responsible for reducing NO_x pollutants chemically?

- Ans**
- ☐ A. Air filter device
 - ☐ B. Diesel oxidation catalyst
 - ☐ C. Turbocharger assembly
 - ☒ D. Urea injection system

Q.54 Which method of heat transfer is most responsible for removing excess engine heat in a water-cooled diesel engine's radiator system?

- Ans**
- ☒ A. Convection of coolant through radiator tubes
 - ☐ B. Conduction of heat through engine block
 - ☐ C. Air conduction through engine block
 - ☐ D. Radiation from engine surfaces

Q.55 How can a properly sealed gasket improve manual transmission longevity and care?

- Ans**
- ☐ A. Requires frequent replacement
 - ☒ B. Reduces maintenance by preventing leaks
 - ☐ C. Increases gear wear over time
 - ☐ D. Synchronizes gear shifting

Q.56 Which material property is most critical for the packing material in absorptive mufflers to maximize sound absorption efficiency?

- Ans**
- ☐ A. Low density and water resistance
 - ☐ B. Moderate surface hardness
 - ☒ C. High porosity and thermal stability
 - ☐ D. High electrical conductivity

Q.57 Which feature is designed on pistons to reduce friction with the cylinder wall?

- Ans**
- ☒ A. A skirt is designed on pistons to reduce friction
 - ☐ B. A pin bore is designed on pistons to reduce friction
 - ☐ C. A groove is designed on pistons to reduce friction
 - ☐ D. A dome is designed on pistons to reduce friction

Q.58 Which ECU-controlled feature adjusts the intake air path into the engine?

- Ans**
- ☐ A. Evaporative emission container
 - ☐ B. Idle speed control
 - ☐ C. Air: Fuel ratio
 - ☒ D. Variable intake manifold

Q.59 How does high humidity in the workshop air affect drying of paint on vehicle surfaces?

- Ans**
- ☐ A. Speeds up the drying process
 - ☐ B. Causes immediate rusting
 - ☐ C. Changes paint color instantly
 - ☒ D. Slows down the drying process

Q.60 During which stroke of the engine cycle are nitrogen oxides produced in the highest amount?

- Ans**
- ☐ A. Intake stroke
 - ☒ B. Power stroke
 - ☐ C. Compression stroke
 - ☐ D. Exhaust stroke

Q.61 What is the correct action after fuel is accidentally spilled on a workshop floor?

- Ans**
- ☐ A. Allow the fuel to dry naturally before cleaning
 - ☐ B. Cover the area and continue normal workshop activity
 - ☒ C. Absorb the fuel and wipe the area immediately
 - ☐ D. Flush the area thoroughly using running water

Q.62 A solenoid actuator converts electrical energy into:

- Ans**
- ☐ A. Optical energy
 - ☐ B. Thermal insulation
 - ☐ C. Chemical energy
 - ☒ D. Linear magnetic actuation

Q.63 What is the main function of an oil pressure relief valve in a diesel engine lubrication system?

- Ans**
- ☒ A. It limits maximum oil pressure in the system
 - ☐ B. It filters contaminants from the oil
 - ☐ C. It cools the engine oil during operation
 - ☐ D. It blocks oil flow completely if pressure is high

Q.64 Which component directly transmits movement to the front wheels in a recirculating ball and nut system?

- Ans**
- ☒ A. The drop arm transmits movement to the front wheels.
 - ☐ B. The worm transmits movement to the front wheels.
 - ☐ C. The ball nut transmits movement to the front wheels.
 - ☐ D. The sector transmits movement to the front wheels.

Q.65 What is the role of the adjustment spring in a thermostatic expansion valve?

- Ans**
- ☒ A. To set the superheat value
 - ☐ B. To filter the refrigerant
 - ☐ C. To sense refrigerant heat
 - ☐ D. To transmit pressure

Q.66 What action do the pistons perform once they are moved by the hydraulic fluid?

- Ans**
- ☐ A. They rotate the brake disc and slow down the vehicle.
 - ☐ B. They retract the brake pads to release the brakes.
 - ☒ C. They move against the brake pads, pressing them against the rotating brake disc.
 - ☐ D. They pump the hydraulic fluid back into the reservoir and slow down the vehicle.

Q.67 Which action should be taken first when fuel is accidentally spilled on a workshop floor?

- Ans**
- ☐ A. Moving nearby tools without removing the spill
 - ☐ B. Opening fuel containers to improve air circulation
 - ☒ C. Applying absorbent material and cleaning the area
 - ☐ D. Continuing work until the current task is finished

Q.68 A technician needs a quick approximate measurement of a machined slot in workshop practice. Which task best represents the use of a steel rule?

- Ans**
- ☐ A. Comparing internal bore sizes of cylindrical parts
 - ☐ B. Marking reference positions near slot edges
 - ☒ C. Checking slot width against a given dimension
 - ☐ D. Guiding straight layout lines on metal surfaces

Q.69 When used in hydraulic power packs, internal gear pumps are preferred because they:

- Ans**
- ☒ A. Circulate coolant efficiently through the pack
 - ☒ B. Provide consistent flow for actuator control
 - ☒ C. Separate air from oil in the reservoir
 - ☒ D. Filter out particles at extremely high pressure

Q.70 According to Ohm's law, current in a conductor is directly proportional to:

- Ans**
- ☒ A. Power
 - ☒ B. Resistance
 - ☒ C. Voltage
 - ☒ D. Resistivity

Q.71 In most vehicles, where is the headlight relay typically located?

- Ans**
- ☒ A. In the fuse box under the hood
 - ☒ B. Mounted on the headlight housing
 - ☒ C. Inside the glove compartment
 - ☒ D. Attached to the battery terminal

Q.72 Which SAE viscosity grade is most suitable for a heavy-duty diesel engine operating continuously under high-load conditions in hot summers and moderately cold winters?

- Ans**
- ☒ A. SAE 10W-30
 - ☒ B. SAE 40
 - ☒ C. SAE 15W-40
 - ☒ D. SAE 5W-20

Q.73 At what point inside the torque converter is the flow called the 'coupling point'?

- Ans**
- ☒ A. When the stator is locked on its shaft
 - ☒ B. When the impeller and turbine reach the same speed
 - ☒ C. When the vehicle is idling at low speed
 - ☒ D. When the impeller rotates faster than the turbine

Q.74 Which construction type is most commonly used in modern passenger vehicles for its durability and handling?

- Ans**
- ☒ A. Radial ply construction
 - ☒ B. Tubeless construction
 - ☒ C. Bias ply construction
 - ☒ D. Solid rubber construction

Q.75 Why is the body of a flat chisel slightly tapered towards the cutting edge?

- Ans**
- ☒ A. To increase striking force
 - ☒ B. To prevent sticking in work
 - ☒ C. To provide hand grip
 - ☒ D. To add striking surface