



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	9:30 AM - 12:00 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 Namia is facing the west. She turns left and walks 15 m. She turns left and walks 25 m. She again turns left and walks 40 m. She finally turns left and walks 40 m to reach home. In which direction is her home with respect to the starting point?

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

Q.2 Which of the following statements correctly reflects the characteristics of a Local Area Network (LAN) and the role of Ethernet within it?

- Ans**
- ☐ A. A LAN always requires Gigabit Ethernet to function and is insecure because it allows open access to all network devices.
 - ☒ B. Ethernet is a standard that governs how devices in a LAN communicate via wired connections, supporting speeds from 10 Mbps to 1000 Mbps.
 - ☐ C. Ethernet in a LAN provides low-speed data transfer and connects users over public Internet infrastructure.
 - ☐ D. LANs are designed for long-distance communication and use Ethernet primarily for wireless data exchange.

Q.3 An engineering student is tasked with creating a detailed side view of a complex machine part for an assembly drawing. Which approach will most accurately represent all features visible from the side while avoiding hidden overlaps or misinterpretations?

- Ans**
- ☐ A. Sketch the side view freely without using projections from the main view
 - ☐ B. Use only hidden lines for representing features on the far side in the view
 - ☐ C. Include all features even those not visible from the selected side view
 - ☒ D. Project all visible elements from the side and omit hidden features unless needed

Q.4 Which statement best describes a 'point' in engineering drawing?

- Ans**
- ☒ A. A point indicates a precise location but has no size, length, or width.
 - ☐ B. A point is a short line segment used to mark measurements.
 - ☐ C. A point is the intersection of two lines and always has measurable length.
 - ☐ D. A point represents a small area with both length and width.

Q.5 The average of 8 numbers is 45. If one number, 59, is removed, what will the new average be?

- Ans**
- ☐ A. 42
 - ☐ B. 41.5
 - ☐ C. 42.5
 - ☒ D. 43

Q.6 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. TN-ZD
 - ☒ B. QK-VA
 - ☒ C. WQ-CG
 - ☒ D. EY-KO

Q.7 A laboratory record shows a distance of 0.004 kilometers between two points. How should this be written in SI units of length for a scientific report?

- Ans**
- ☒ A. 0.4 m
 - ☒ B. 400 cm
 - ☒ C. 4 m
 - ☒ D. 4000 mm

Q.8 Which of the following best defines 'work' in physics?

- Ans**
- ☒ A. Work is done when energy is stored in an object.
 - ☒ B. Work is done when a force moves an object in the direction of the force.
 - ☒ C. Work is done whenever a force is applied, regardless of movement.
 - ☒ D. Work is done if a force acts at any angle to the motion.

Q.9 Which situation best describes an entanglement hazard in a mechanical workshop?

- Ans**
- ☒ A. Loose clothing caught in a rotating shaft
 - ☒ B. Hand pinched between gears
 - ☒ C. Gloves worn near hot surfaces
 - ☒ D. Finger cut by a sharp edge

Q.10 What is the primary function of a fire hydrant in a workplace safety system?

- Ans**
- ☒ A. Activating fire alarms automatically in emergencies
 - ☒ B. Supplying large quantities of water to fight fires
 - ☒ C. Removing hazardous fumes from the area
 - ☒ D. Detecting smoke and warning employees

Q.11 There are two types of silver–copper alloys. The first alloy contains $93\frac{1}{3}\%$ silver, while the second alloy contains $86\frac{2}{3}\%$ silver. Find the amount of the first alloy that should be mixed with some quantity of the second alloy to obtain a 100 kg mixture containing 90% silver.

- Ans**
- ☒ A. 52 kg
 - ☒ B. 50 kg
 - ☒ C. 48 kg
 - ☒ D. 45 kg

Q.12 Below are given two sets of numbers. 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.)

10 - 100 - 50 - 25; 2 - 4 - 2 - 1

- Ans**
- ☒ A. 12 - 144 - 62 - 31
 - ☒ B. 4 - 16 - 8 - 4
 - ☒ C. 5 - 25 - 15 - 7
 - ☒ D. 8 - 64 - 32 - 14

Q.13 A diamond ring costs ₹85,000. Its price is reduced first by 11% and then by 4% on the reduced price. Find the final price of the ring after both discounts.

- Ans**
- ☒ A. ₹73,624
 - ☒ B. ₹72,604
 - ☒ C. ₹72,624
 - ☒ D. ₹74,624

Q.14 Solve the system of equations:

$$-3x + 2y - z = -1, 6x - 6y + 7z = -7, 3x - 4y + 4z = -6$$

- Ans**
- ☒ A. $x=2, y=1, z=-3$
 - ☒ B. $x=2, y=2, z=-1$
 - ☒ C. $x=1, y=2, z=2$
 - ☒ D. $x=-2, y=2, z=11$

Q.15 What should come in place of the question mark (?) in the given series based on the English alphabetical order?

UMD ZQG EUJ JYM ?

- Ans**
- ☒ A. NBQ
 - ☒ B. NDO
 - ☒ C. OCP
 - ☒ D. PDP

Q.16 In this question, a group of numbers/symbols is coded using letter codes as per the codes given below and the conditions which follow. The correct combination of codes following the conditions is your answer. 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	6	1	&	3	%	8	+	4	#	7	@	5	2	\$
Code	R	V	G	D	S	C	T	L	F	W	H	U	Y	N

Conditions:

- (i) If the first element is a symbol and the last element is 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 last elements are to be coded as ©.
- (iii) If both the 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?

+ 6 \$ 2 7

- Ans**
- ☒ A. TSNWW
 - ☒ B. WRNYT
 - ☒ C. STMWV
 - ☒ D. WSNYT

Q.17 In this question, 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.

Q. Among five people – A, B, C, D, and E – who is the tallest?

(I) A is taller than B. B is taller than C.

(II) D is taller than E.

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

Q.18 Simplify: $60 - \{(-8) \times (-16 - 19 - 2)\} \div [5 \times \{2 + (-1) \times (-1)\}]$

- Ans**
- ☒ A. $\frac{604}{15}$
 - ☒ B. $\frac{608}{15}$
 - ☒ C. $\frac{594}{15}$
 - ☒ D. $\frac{614}{15}$

Q.19 Three workers, X, Y, and Z, can complete a certain job in 10 days, 12 days, and 15 days, respectively. Determine the number of days required for them to complete the job when they work together.

- Ans**
- ☒ A. 8 days
 - ☒ B. 5 days
 - ☒ C. 4 days
 - ☒ D. 6 days

Q.20 Seven boxes, P, Q, S, T, U, V, and W, are kept one over the other, but not necessarily in the same order. Only three boxes are kept above S. Exactly one box is kept between T and S. Exactly three boxes are kept between T and U, and U is kept somewhere above S. V is kept immediately below U. W is kept at one of the places above P. Q is not kept immediately above or below T. Based on the given information, which box is kept at the lowermost position?

- Ans**
- ☐ A. Q
 - ☐ B. V
 - ☐ C. S
 - ☒ D. P

Q.21 What is an email used for?

- Ans**
- ☐ A. Data processing
 - ☐ B. File storage
 - ☒ C. Sending messages
 - ☐ D. Creating documents

Q.22 The median of the following data is :
25, 15, 23, 25, 17, 27, 20, 18, 24, 30, 19, 28, 35, 10, 31, 40

- Ans**
- ☐ A. 25
 - ☐ B. 23.5
 - ☒ C. 24.5
 - ☐ D. 20.5

Q.23 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 glasses are spoons.
All spoons are forks.

Conclusions:

(I) Some glasses are forks.
(II) All forks are spoons.

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

Q.24 What do touch gestures in Microsoft Windows allow users to do?

- Ans**
- ☐ A. Connect external devices
 - ☒ B. Perform actions using finger movements
 - ☐ C. Type faster on the keyboard
 - ☐ D. Increase screen brightness

Q.25 A roller coaster at the top of its track has maximum potential energy. As it descends and speeds up, what principle explains why the sum of its kinetic and potential energies remains constant if we ignore friction and air resistance?

- Ans**
- ☐ A. Principle of superposition
 - ☐ B. Principle of inertia
 - ☐ C. Law of inertia
 - ☒ D. Law of conservation of energy

- Q.26** Which is the most important safety check before operating any machine in a workshop?
- Ans**
- ☒ A. Ensure the machine area is properly illuminated
 - ☒ B. Inspect the machine for loose or damaged parts
 - ☒ C. Check if the machine is plugged in properly
 - ☒ D. Wipe the machine with a dry cloth before use

- Q.27** Refer to the following letter and symbol series and answer the question that follows.
Counting to be done from left to right.

(Left) Z @ B R J # D * Q A M S % P L V O U S N T W Z (Right)

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

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

- Q.28** 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. CH – EK
 - ☒ B. DJ – GM
 - ☒ C. AF – DI
 - ☒ D. BG – EJ

- Q.29** In a certain code language, 'KING' is coded as '9713' and 'ITCH' is coded as '2945'. What is the code for 'I' in the given code language?

- Ans**
- ☒ A. 9
 - ☒ B. 4
 - ☒ C. 7
 - ☒ D. 2

- Q.30** Which integrated strategy best addresses soil pollution, falling crop yields, and low microbial activity near an industrial zone?

- Ans**
- ☒ A. Expand urban areas into farmland.
 - ☒ B. Ban all regional chemical fertilizers.
 - ☒ C. Control industrial waste for sustainability.
 - ☒ D. Reforestation in nearby urban centers.

- Q.31** In this question, 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 the five poles—I, N, C, H, and L—each having a different height, which pole is the tallest?

(I) I is shorter than N but taller than C. C is taller than only one pole.
(II) H is taller than L.

- 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.32 If 'A' stands for '+', 'B' stands for 'x', 'C' stands for '+' and 'D' stands for '-', what will come in place of the question mark '?' in the following equation?

$$14 A 30 B 45 C 15 D 9 = ?$$

- Ans**
- ☐ A. 29
 - ☐ B. 28
 - ☒ C. 27
 - ☐ D. 25

Q.33 If Rohan's income increases by 20% and his expenditure increases by 10%, then his savings increase by ₹1,200. If his original income was ₹12,000, what was his original expenditure? (Assume that savings = income – expenditure.)

- Ans**
- ☐ A. ₹10,000
 - ☐ B. ₹9,000
 - ☐ C. ₹11,000
 - ☒ D. ₹12,000

Q.34 G is the mother of Y. Y is the sister of V. S is the father of L. L is the husband of V. How is G related to S?

- Ans**
- ☐ A. Son's wife
 - ☒ B. Son's wife's mother
 - ☐ C. Mother's mother
 - ☐ D. Son's wife's sister

Q.35 A worker's hand is at risk of injury from a mechanical shearing action. Which situation best describes a shearing hazard?

- Ans**
- ☐ A. A hand touching a hot metallic machine surface during maintenance activity
 - ☒ B. A hand caught between a moving blade and a fixed machine surface during operation
 - ☐ C. A hand becoming entangled in a rotating machine shaft during operation
 - ☐ D. A hand sliding repeatedly across a rough abrasive machine surface during work

Q.36 What is the main purpose of ambient air quality standards?

- Ans**
- ☐ A. To focus exclusively on industrial operations while ignoring other sectors.
 - ☐ B. To require all industries to reduce emissions by the exact same percentage.
 - ☐ C. To ensure air is routinely sampled to map historical pollution trends.
 - ☒ D. To set legally permissible limits for specific pollutants to protect public health.

Q.37 A pendulum takes 60 seconds to complete 24 oscillations. If its length is increased and it now takes 72 seconds for the same number of oscillations, what has happened to its time period?

- Ans**
- ☐ A. It has decreased to 1.5 seconds
 - ☒ B. It has increased to 3.0 seconds
 - ☐ C. It has decreased to 2.0 seconds
 - ☐ D. It remains at 2.5 seconds

Q.38 What is the best description of the purpose of multi-view drawing in engineering drawing?

- Ans**
- ☐ A. To view an object from only one direction
 - ☐ B. To show different colors of an object for better visual appearance
 - ☒ C. To represent different sides of an object clearly on a flat surface
 - ☐ D. To present the object in a single three-dimensional visual form only

Q.39 A train X crosses a man who is sitting in another train Y, which is moving in the opposite direction, in 8 seconds. However, when both trains are moving in the same direction, train X takes 20 seconds to pass the same man. If the length of train X is 360 meters and the length of train Y (in which the man is sitting) is 240 meters, what is the speed of train Y?

- Ans**
- ✓ A. 48.6 km/h
 - ✗ B. 45.3 km/h
 - ✗ C. 46.5 km/h
 - ✗ D. 45.8 km/h

Q.40 Select the pair which follows the same pattern as that followed by the two pairs given below. Both pairs follow the same pattern.

BIP : EMU
GNU : JRZ

- Ans**
- ✗ A. XDE : PON
 - ✗ B. CGW : NHT
 - ✓ C. FMT : IQY
 - ✗ D. VCD : GRD

Q.41 A boat sails 40 km downstream and then 40 km upstream in a river. The boat's speed in still water is 12 km/hr and the speed of the stream is 4 km/hr. How much time does the boat take to cover the entire distance (both upstream and downstream)?

- Ans**
- ✗ A. 10 hours
 - ✗ B. 6 hours
 - ✗ C. 8 hours
 - ✓ D. 7.5 hours

Q.42 Three pipes A, B and C can fill a tank in 12 hours, 18 hours and 24 hours, respectively. A leak at the bottom can empty the full tank in 36 hours. If all the pipes are opened together, in how many hours will the tank be filled? (Round off your answer to two decimal places.)

- Ans**
- ✗ A. 9.45 hours
 - ✓ B. 6.55 hours
 - ✗ C. 3.33 hours
 - ✗ D. 5.56 hours

Q.43 Find the LCM of 72, 78, and 90.

- Ans**
- ✗ A. 4250
 - ✗ B. 4120
 - ✓ C. 4680
 - ✗ D. 4280

Q.44 Which line symbol is commonly used in engineering drawings to represent a hidden edge that is not directly visible?

- Ans**
- ✗ A. Chain thin line
 - ✓ B. Dashed line
 - ✗ C. Zigzag line
 - ✗ D. Solid thick line

Q.45 A trader buys 187 pens at ₹23 each. During transportation, 7 pens get damaged and cannot be sold. He sells the remaining pens at ₹27 each. Find his profit percentage. (rounded off to one decimal place)

- Ans**
- ☒ A. 14.1%
 - ☒ B. 13.0%
 - ☒ C. 13.7%
 - ☒ D. 12.6%

Q.46 In how many years will a sum of ₹16,000 at 10% per annum compounded semi-annually become ₹18,522?

- Ans**
- ☒ A. 1.5 years
 - ☒ B. 2.5 years
 - ☒ C. 2 years
 - ☒ D. 1 year

Q.47 An engineer is tasked with creating a hollow cone for a machine part, where the wall thickness must be consistent and the slant height is critical for assembly. Which factor is most important to ensure the cone will fit correctly in the final design?

- Ans**
- ☒ A. Ensuring the slant height matches the assembly requirement
 - ☒ B. Prioritizing uniform wall thickness over all other features
 - ☒ C. Matching only the overall height of the cone
 - ☒ D. Focusing only on base diameter for precise fit

Q.48 Which of the following letter-number clusters will replace the question mark (?) in the given series to make it logically complete?

QOI 5, OMG 10, MKE 15, KIC 20, ?

- Ans**
- ☒ A. IHS 23
 - ☒ B. IGA 25
 - ☒ C. HIZ 30
 - ☒ D. JHZ 24

Q.49 Which of the following scenarios best demonstrates the conversion of chemical energy to mechanical energy?

- Ans**
- ☒ A. A flashlight turns on after inserting new batteries
 - ☒ B. A stone falls off a table to the ground
 - ☒ C. A stretched rubber band snaps back to its original shape
 - ☒ D. A runner uses stored energy from food to sprint forward

Q.50 A father distributed two different amounts among his sons P, Q, R and S. First amount was distributed in the ratio 5 : 4 : 3 : 2 and the second amount was distributed in the ratio 6 : 7 : 8 : 9. If the second amount is thrice the first amount, then which son will get the maximum amount?

- Ans**
- ☒ A. Q
 - ☒ B. P
 - ☒ C. R
 - ☒ D. S

Q.51 A sample of water is heated from 15 degrees Celsius to 35 degrees Celsius. What is the temperature change in Kelvin?

- Ans**
- ☒ A. The temperature change is 50 K.
 - ☒ B. The temperature change is 30 K.
 - ☒ C. The temperature change is 20 K.
 - ☒ D. The temperature change is 15 K.

Q.52 A sum of ₹420 is divided among A, B, C, and D such that: $A : B = 4 : x$, $B : C = x : 7$, $C : D = 6 : (x - 3)$. If B and C together get ₹210, find the value of x.

- Ans**
- ✓ A. 39
 - ✗ B. 42
 - ✗ C. 53
 - ✗ D. 27

Q.53 O, P, Q, U and V have different heights. Only three people have heights between V and Q. P is taller than U but shorter than O. V is taller than Q. How many people are shorter than P?

- Ans**
- ✓ A. Two
 - ✗ B. Four
 - ✗ C. Three
 - ✗ D. One

Q.54 The circumference of the base of a solid right circular cylinder is 88 cm and its height is 150 cm. What is the volume (in cm^3) of the cylinder?

(Take $\pi = \frac{22}{7}$)

- Ans**
- ✗ A. 92500
 - ✓ B. 92400
 - ✗ C. 92550
 - ✗ D. 92450

Q.55 P, Q, R, S and T have different ages. T is elder than only one person. S is elder than P but younger than Q. R is elder than Q. Who is the youngest?

- Ans**
- ✓ A. P
 - ✗ B. S
 - ✗ C. Q
 - ✗ D. R

Q.56 If $\left(x + \frac{1}{x}\right) = 3$, find the value of $\left(x^3 + \frac{1}{x^3}\right)$.

- Ans**
- ✓ A. 18
 - ✗ B. 16
 - ✗ C. 20
 - ✗ D. 15

Q.57 A runner completes one lap of a 200 meter circular track in 50 seconds. What is the average speed of the runner?

- Ans**
- ✗ A. 4.5 meter per second
 - ✗ B. 3.5 meter per second
 - ✗ C. 3 meter per second
 - ✓ D. 4 meter per second

Q.58 If 'A' stands for '+', 'B' stands for '-', 'C' stands for 'x' and 'D' stands for '÷', then what will come in place of the question mark (?) in the following equation?

$31 \text{ B } 35 \text{ D } 7 \text{ A } 9 \text{ C } 2 = ?$

- Ans**
- ✗ A. 42
 - ✗ B. 48
 - ✗ C. 46
 - ✓ D. 44

Q.59 What should come in place of the question mark (?) in the given series?

98, 104, 116, 134, 158, ?

- Ans**
- ☐ A. 186
 - ☐ B. 184
 - ☒ C. 188
 - ☐ D. 190

Q.60 E, F, G, H, L and M live on six different floors of the same building. The lowermost floor in the building is numbered 1, the floor above it, number 2 and so on, till the topmost floor is numbered 6. Only three people live above G. Only two people live between L and E. Only two people live between M and G. E lives below G but above F. How many people live below H?

- Ans**
- ☐ A. One
 - ☐ B. Four
 - ☐ C. Two
 - ☒ D. Three

Q.61 Refer to the given letter series and answer the question that follows. Counting to be done from left to right.

(Left) B F O P P S Q A L M K A W X S N U Q J O M Y (Right)

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

- Ans**
- ☐ A. 6
 - ☐ B. 7
 - ☐ C. 4
 - ☒ D. 5

Q.62 Two students move identical boxes through a distance of 10 m. Student A applies a force of 50 N, while Student B applies a force of 100 N. What is the difference in the work done by the two students?

- Ans**
- ☐ A. 50 J
 - ☒ B. 500 J
 - ☐ C. 1000 J
 - ☐ D. 0 J

Q.63 An object has a mass of 10 kilograms. How does its weight on the Moon compare to its weight on Earth?

- Ans**
- ☒ A. The object weighs less on the Moon than on Earth
 - ☐ B. The object weighs more on the Moon than on Earth
 - ☐ C. The object weighs zero on the Moon
 - ☐ D. The object weighs the same on both the Moon and Earth

Q.64 16 is related to 260 following a certain logic. Following the same logic, 25 is related to 630. To which of the following is 9 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 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.)

- Ans**
- ☒ A. 84
 - ☐ B. 78
 - ☐ C. 732
 - ☐ D. 729

Q.65 Which approach most effectively reduces both nitrogen and phosphorus concentrations during wastewater treatment?

- Ans**
- ☒ A. Biological and chemical nutrient removal
 - ☐ B. Primary sedimentation with extended aeration
 - ☐ C. Surface-flow constructed wetlands
 - ☐ D. UV disinfection following secondary treatment

Q.66 Which of the following statements correctly describes average velocity and its SI unit?

- Ans**
- ☐ A. Average velocity is the total distance divided by total time, and its unit is meter per second.
 - ☒ B. Average velocity is the total displacement divided by total time, and its unit is meter per second.
 - ☐ C. Average velocity is the total displacement divided by total time, and its unit is kilometer per hour.
 - ☐ D. Average velocity is the total distance divided by total time, and its unit is kilometer per hour.

Q.67 When a moving car suddenly applies brakes, its kinetic energy is transformed mainly into which form of energy?

- Ans**
- ☐ A. Potential energy
 - ☒ B. Heat energy
 - ☐ C. Light energy
 - ☐ D. Sound energy

Q.68 Which of the following best describes a key environmental concern associated with improper disposal of e-waste?

- Ans**
- ☒ A. Release of toxic metals into soil and water
 - ☐ B. Release of greenhouse gases from decomposition
 - ☐ C. Increased recycling rates of precious metals
 - ☐ D. Enhanced biodegradation of plastics

Q.69 PJAE is related to JOWH in a certain way based on the English alphabetical order. In the same way, OIVC is related to INRF. To which of the following is NEZF related to following the same logic?

- Ans**
- ☐ A. HKVJ
 - ☐ B. IJVJ
 - ☒ C. HJVI
 - ☐ D. IKUH

Q.70 If 'A' stands for '+', 'B' stands for '−', 'C' stands for '×' and 'D' stands for '÷', then what will come in place of the question mark (?) in the following equation?

$$28 \text{ A } 16 \text{ C } 3 \text{ B } 12 \text{ D } 4 = ?$$

- Ans**
- ☒ A. 73
 - ☐ B. 71
 - ☐ C. 72
 - ☐ D. 70

Q.71 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: All girls are hens. No hen is a cat.

Conclusion (I): No girl is a cat.

Conclusion (II): Some cats are hens.

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

Q.72 In a spreadsheet application, a user selects a range of cells and presses Ctrl + C, followed by Ctrl + V in a different worksheet. What happens to the data?

- Ans**
- ☐ A. The selected cells are moved to the new worksheet.
 - ☒ B. The selected cells are copied to the new worksheet.
 - ☐ C. The selected cells are saved to a new file.
 - ☐ D. The selected cells are deleted from the original worksheet.

Q.73 In third angle projection, where is the object placed relative to the plane of projection?

- Ans**
- ☐ A. The object is placed in the first quadrant
 - ☐ B. The object is placed in the second quadrant
 - ☐ C. The object is placed in the fourth quadrant
 - ☒ D. The object is placed in the third quadrant

Q.74 The simple interest earned on a certain sum of money for 3 years at 15% per annum is ₹2,700. Find the sum.

- Ans**
- ☐ A. ₹9,000
 - ☐ B. ₹8,000
 - ☐ C. ₹5,000
 - ☒ D. ₹6,000

Q.75 A car travels 60 km north in 2 hours, then 40 km south in the next 1 hour. What is the car's average velocity over the entire trip?

- Ans**
- ☐ A. 20 km/h south
 - ☒ B. 6.7 km/h north
 - ☐ C. 0 km/h
 - ☐ D. 33.3 km/h north

Q.76 Which component makes up the largest proportion of Earth's atmosphere by volume?

- Ans**
- ☐ A. Oxygen
 - ☐ B. Argon
 - ☒ C. Nitrogen
 - ☐ D. Carbon dioxide

Q.77 A cyclist covers 120 meters in 16 seconds on a straight road, then immediately covers 180 meters in 24 seconds on a similar road segment. What is the average speed of the cyclist during the entire journey?

- Ans**
- ☐ A. 6.5 meters per second
 - ☐ B. 8.0 meters per second
 - ☒ C. 7.5 meters per second
 - ☐ D. 7.0 meters per second

Q.78 A trader marks an article 25% above its cost price. He allows a discount of 10% on the marked price. After giving the discount, he makes a profit of ₹180 on the article. What is the cost price of the article?

- Ans**
- ☐ A. ₹1,380
 - ☐ B. ₹1,200
 - ☐ C. ₹1,260
 - ☒ D. ₹1,440

Q.79 A thermometer shows a reading of 37 degrees Celsius. What is the corresponding temperature in Kelvin?

- Ans**
- ☐ A. 320 K
 - ☐ B. 300 K
 - ☒ C. 310 K
 - ☐ D. 270 K

Q.80 A shopkeeper marks a product 75% above cost price and offers two successive discounts of 30% and 40%. What is the profit or loss percentage?

- Ans**
- ☐ A. 20.9% profit
 - ☐ B. 15.7% profit
 - ☐ C. 22.6% profit
 - ☒ D. 26.5% loss

Q.81 A car travels 90 km east and then 30 km west along the same straight road. If the entire journey takes 3 hours, what is the average velocity of the car?

- Ans**
- ☐ A. 30 km/h east
 - ☐ B. 40 km/h east
 - ☒ C. 20 km/h east
 - ☐ D. 50 km/h north

Q.82 Refer to the following letter series and answer the question that follows. Counting to be done from left to right only.

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

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

- Ans**
- ☐ A. 2
 - ☐ B. 1
 - ☒ C. 3
 - ☐ D. 0

Q.83 An engineer is tasked with creating the front view of a mechanical part. The part has a rectangular base with a vertical circular hole passing through it and a triangular prism attached on top. Which of the following best describes what will be visible in the front view?

- Ans**
- ☐ A. The outline of triangular prism and circular hole will be visible in front view only
 - ☐ B. Only the rectangular base outline will be visible in the front view drawing
 - ☒ C. The outline of rectangular base and triangular prism will be visible but hole is not shown
 - ☐ D. Only the triangular prism will be clearly visible in the front view drawing

Q.84 When using a hand file during fitting operations, which action demonstrates adherence to tool safety protocols?

- Ans**
- ☒ A. Fitting a proper handle securely to the tang
 - ☐ B. Applying excessive downward force when filing
 - ☐ C. Holding the file near its tang during filing work
 - ☐ D. Filing above shoulder height for better leverage

Q.85 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 Shreya related to Mahak if 'Shreya + Dev - Taran × Harshit % Mahak'?

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

Q.86 A car travels on a highway, and its odometer records a reading of 180 km at 8:00 am and 240 km at 9:30 am. Based on this information, which statement best describes the car's average speed during this interval?

- Ans**
- ☒ A. The car's average speed is 40 km per hour as calculated from the odometer readings and time interval.
 - ☐ B. The car's average speed is 240 km per hour since that was the odometer reading at 9:30 am.
 - ☐ C. The car's average speed is 180 km per hour since that was the odometer reading at 8:00 am.
 - ☐ D. The car's average speed is 60 km per hour based only on the change in odometer readings.

Q.87 What is the simplified value of the expression $\left[\frac{\cos A}{(1 - \tan A)} \right] + \left[\frac{\sin A}{(1 - \cot A)} \right]$?

- Ans**
- ☒ A. $\cos A + \sin A$
 - ☐ B. 1
 - ☐ C. 0
 - ☐ D. $\sin A - \cos A$

Q.88 What should come in place of the question mark (?) in the given series?

74, 83, 101, 128, ?, 209

- Ans**
- ☒ A. 164
 - ☐ B. 155
 - ☐ C. 146
 - ☐ D. 176

Q.89 A tangent PQ at a point P of a circle of radius 5 cm meets a line through the center O at a point Q such that OQ = 12 cm. What is the length of PQ?

- Ans**
- ☒ A. $\sqrt{119}$ cm
 - ☐ B. $\sqrt{107}$ cm
 - ☐ C. $\sqrt{117}$ cm
 - ☐ D. $\sqrt{97}$ cm

Q.90 A car of mass 1200 kg accelerates from rest to a speed of 20 m/s on a straight road. If the kinetic energy gained by the car is completely due to the work done by the engine, which of the following best represents the total kinetic energy acquired by the car at this speed?

- Ans**
- ☐ A. 480,000 joules
 - ☐ B. 12,000 joules
 - ☒ C. 240,000 joules
 - ☐ D. 24,000 joules

Q.91 A conical tent has a base radius of 14 m and a height of 48 m. How many cubic meters of air can it hold? (Use $\pi = \frac{22}{7}$)

- Ans**
- ☐ A. 9568
 - ☒ B. 9856
 - ☐ C. 9865
 - ☐ D. 8956

Q.92 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 X and Z when counted from the right of X. Only two people sit between Z and D. Only three people sit between X and B. A sits to the immediate left of C. Who sits third to the left of Y?

- Ans**
- ☒ A. C
 - ☐ B. Z
 - ☐ C. X
 - ☐ D. A

Q.93 A mechanical engineer must design a flange joint where two pipes are to be connected at a 45-degree angle. Which method should the engineer use to accurately represent the intersection line on a technical drawing of the two cylindrical pipes?

- Ans**
- ☐ A. Represent the intersection as a straight line in the side view
 - ☒ B. Draw the true shape of the intersection using auxiliary projection
 - ☐ C. Use only standard orthographic projection without auxiliary views
 - ☐ D. Draw a simple circle at the junction in the top view

Q.94 Which feature is a requirement of the BIS drawing standard in engineering drawings?

- Ans**
- ☒ A. Title block with specific information
 - ☐ B. Use of colored pencils for clarity
 - ☐ C. Freehand sketches without scale
 - ☐ D. Margin lines of random width

Q.95 An engineer uses fault tree analysis to assess a machine-related injury in a factory. Which step should be taken first according to standard procedure?

- Ans**
- ☐ A. List all possible causes of failures
 - ☒ B. Define the top event representing the injury
 - ☐ C. Validate the analysis using workplace data
 - ☐ D. Establish preventive measures to control risks

Q.96 Which property of a fuse wire ensures it melts quickly when excess current flows?

- Ans**
- ☐ A. High electrical resistance
 - ☐ B. High melting point
 - ☒ C. Low melting point
 - ☐ D. Thick wire

Q.97 If a scooter travels at a constant speed of 25 km per hour, how far will it travel in 4 hours?

- Ans**
- ☐ A. 75 km
 - ☐ B. 80 km
 - ☒ C. 100 km
 - ☐ D. 120 km

Q.98 Which of the following is both, an input and output device?

- Ans**
- ☒ A. Keyboard
 - ☒ B. Touchscreen monitor
 - ☒ C. Printer
 - ☒ D. Projector

Q.99 If the mean of the following data is 40, then what is the value of x?

Class	10-20	20-30	30-40	40-50	50-60
Frequency	30	27	44	29	X

- Ans**
- ☒ A. 98
 - ☒ B. 82
 - ☒ C. 93
 - ☒ D. 99

Q.100 What is the typical temperature range covered by a laboratory thermometer used in school experiments?

- Ans**
- ☒ A. Minus fifty to fifty degrees Celsius
 - ☒ B. Minus ten to one hundred and ten degrees Celsius
 - ☒ C. Zero to two hundred degrees Celsius
 - ☒ D. Thirty five to forty two degrees Celsius

Section : PART-B

Q.1 What happens to the vehicle's rear ride height when the rubber air cylinder is pressurized in a load-adjustable shock absorber?

- Ans**
- ☒ A. The rear ride height remains unchanged
 - ☒ B. The rear ride height increases
 - ☒ C. The rear ride height becomes uneven side to side
 - ☒ D. The rear ride height decreases

Q.2 A failure analysis shows a big-end bearing with excessive scoring and shaft damage. Which property was likely insufficient in the bearing material?

- Ans**
- ☒ A. High hardness of the bearing
 - ☒ B. Good thermal conductivity
 - ☒ C. High tensile strength of the bearing
 - ☒ D. Embeddability of the bearing material

Q.3 Which warning sign on the dashboard may indicate a seat belt pretensioner issue?

- Ans**
- ☒ A. A headlight warning flashes
 - ☒ B. A seat belt warning light remains on
 - ☒ C. An air conditioning warning appears
 - ☒ D. A radio warning message is shown

Q.4 Under what condition will the shift valve delay a gear shift in automatic transmission?

- Ans**
- ☒ A. If the vehicle is accelerating gently.
 - ☒ B. If the vehicle is accelerating quickly.
 - ☒ C. If the vehicle is in idling state.
 - ☒ D. If the vehicle is braking heavily.

Q.5 Which tool is most appropriate for checking battery terminal tightness during routine automobile maintenance?

- Ans**
- ☒ A. A spanner of correct size
 - ☐ B. A clean paintbrush
 - ☐ C. A rubber head hammer
 - ☐ D. A flathead screwdriver

Q.6 An engine consumes excessive oil and oil is found in the combustion chamber. What action should be taken?

- Ans**
- ☐ A. Remove excess oil
 - ☒ B. Replace the piston rings
 - ☐ C. Replace the main bearings
 - ☐ D. Use oil of higher viscosity

Q.7 What is the standard figure to represent a shaft in a cross-sectional engineering drawing?

- Ans**
- ☐ A. Rectangle
 - ☒ B. Circle
 - ☐ C. Square
 - ☐ D. Triangle

Q.8 When performing alternator maintenance, you replace a component that connects the rotor to the external circuit. Which part is this?

- Ans**
- ☐ A. Stator winding
 - ☐ B. Rectifier assembly
 - ☐ C. Voltage regulator
 - ☒ D. Slip rings

Q.9 A technician measures only the outside diameter of a rim. What mistake has been made in defining the rim size?

- Ans**
- ☐ A. Measured the inner circumference
 - ☐ B. Used tyre sidewall measurement
 - ☒ C. Omitted the width of the rim
 - ☐ D. Included tread depth only

Q.10 Which component directly connects the engine crankshaft to the automatic transmission in a torque converter system?

- Ans**
- ☒ A. Drive plate
 - ☐ B. Clutch
 - ☐ C. Governor
 - ☐ D. Oil pump

Q.11 What are the likely consequences of air leaking into a lift pump inlet during operation?

- Ans**
- ☐ A. Engine runs cooler
 - ☐ B. Engine power increases
 - ☒ C. Engine may run irregularly
 - ☐ D. Emissions are improved

Q.12 Which application best demonstrates the practical use of outside callipers in automotive work?

- Ans**
- ☒ A. Checking uniform shaft diameter at different locations
 - ☐ B. Measuring drilled hole depth during machining work
 - ☐ C. Marking reference lines on fabricated metal surfaces
 - ☐ D. Measuring internal bore diameter of engine cylinders

Q.13 Which symptom can indicate improper alignment of the piston assembly?

- Ans**
- ☐ A. High coolant loss from engine
 - ☐ B. Increased oil pressure reading
 - ☐ C. Fuel dilution in oil sump
 - ☒ D. Irregular wear on piston skirt

Q.14 How do some run-flat tyres support vehicle weight after a puncture?

- Ans**
- ☐ A. By containing a rubber foam insert inside the tyre
 - ☐ B. By having an extra air reservoir in the rim
 - ☒ C. By using stiffer sidewalls that can support the vehicle
 - ☐ D. By reinforcing the tread with steel mesh

Q.15 Which of the following component links both the steering arms together in the conventional steering system?

- Ans**
- ☐ A. The drag link rod links both the steering arms
 - ☐ B. The stabilizer bar links both the steering arms
 - ☐ C. The drop arm links both the steering arms
 - ☒ D. The track rod connects both the steering arms.

Q.16 In a pure intrinsic semiconductor, where is the Fermi level located?

- Ans**
- ☐ A. Inside the conduction band
 - ☒ B. Near the middle of the forbidden energy gap
 - ☐ C. Inside the valence band
 - ☐ D. Near the power supply voltage

Q.17 A technician needs to synchronize the extension speed of two hydraulic cylinders operating under different loads. Which application of flow control valves is most effective?

- Ans**
- ☐ A. Placing a flow control valve only in the return line from both cylinders
 - ☒ B. Installing flow control valves in the lines to both cylinders to balance fluid flow
 - ☐ C. Adjusting pump output to increase overall system pressure for both cylinders
 - ☐ D. Using a pressure relief valve to stabilize system pressure for both cylinders

Q.18 Which failure is most likely if the camshaft drive gears are worn out?

- Ans**
- ☐ A. Coolant will leak from the radiator
 - ☐ B. Alternator will generate excess current
 - ☐ C. Fuel delivery will be blocked
 - ☒ D. Valve timing will become inaccurate

Q.19 What is a common symptom of a failing electric vehicle battery?

- Ans**
- ☐ A. High oil consumption
 - ☐ B. Knocking engine sound
 - ☒ C. Reduced driving range
 - ☐ D. Unusual exhaust smoke

Q.20 Which scenario best demonstrates the advantage of electronic adjustable shock absorbers on different road conditions?

- Ans**
- ☒ A. Using only manual adjustments without electronics
 - ☒ B. Changing the dampening rate according to road conditions
 - ☒ C. Keeping the dampening rate unchanged regardless of speed
 - ☒ D. Maintaining a fixed soft setting for all driving conditions

Q.21 If the Engine Control Unit (ECU) detects a fault, how can the specific problem area be identified?

- Ans**
- ☒ A. By checking engine oil viscosity
 - ☒ B. By a code provided by the ECU
 - ☒ C. By checking engine spark plugs
 - ☒ D. By checking compression pressure

Q.22 Which engine cooling method removes heat by circulating a liquid around the cylinder walls and transferring it to a radiator?

- Ans**
- ☒ A. Water cooling method using liquid coolant
 - ☒ B. Oil cooling method using lubricating oil
 - ☒ C. Air cooling method using cooling fins
 - ☒ D. Exhaust cooling method using outlet gases

Q.23 A vehicle's Diagnostic Trouble Code (DTC) is read as a generic code. What does this imply about the fault?

- Ans**
- ☒ A. The issue is defined by manufacturer and not unique to the industry standards
 - ☒ B. The code is not recognized by the code reader, needs update
 - ☒ C. The issue is defined by industry standards and not unique to the manufacturer
 - ☒ D. The problem is unique to that vehicle model

Q.24 Why must the secondary pulley shaft in a **Continuously Variable Transmission (CVT)** be manufactured precisely?

- Ans**
- ☒ A. Allow flexibility during operation
 - ☒ B. Ensure accurate torque transmission
 - ☒ C. Adjust its length automatically
 - ☒ D. Resist chemical corrosion

Q.25 Why is it important to use a V block when drilling a round rod?

- Ans**
- ☒ A. It cools the workpiece
 - ☒ B. It changes the drill size
 - ☒ C. It prevents the rod from rolling
 - ☒ D. It increases drilling speed

Q.26 Why are hydraulic systems used in automobile power steering mechanisms?

- Ans**
- ☒ A. They decrease fuel consumption at high speed
 - ☒ B. They reduce driver effort when turning the wheel
 - ☒ C. They control the lighting circuits in vehicles
 - ☒ D. They increase engine speed during turns

Q.27 When using a depth micrometer, which constructional aspect helps keep the instrument stable and reduce measurement error?

- Ans**
- ☒ A. The rigid base minimizes movement during use
 - ☒ B. The thimble resists external vibrations
 - ☒ C. The ratchet stop absorbs vibration impacts
 - ☒ D. The rods stabilize the entire instrument

Q.28 What is a critical factor to consider when selecting a taper reamer for aligning two components with a tapered pin?

- Ans**
- ☐ A. Selecting the hardest available material
 - ☒ B. Matching the taper angle of the pin and reamer
 - ☐ C. Ensuring equal tool length to the pin
 - ☐ D. Matching the flute count to the pin

Q.29 If the potentiometer in the vane-type air flow sensor fails, what is a likely result?

- Ans**
- ☐ A. The ECU ignores all sensor inputs
 - ☐ B. The sensor measures fuel pressure in place of air
 - ☒ C. The ECU receives inaccurate airflow data
 - ☐ D. The injectors are directly controlled by the potentiometer

Q.30 Which impact is most directly associated with the use of extractors in a vehicle's exhaust system under sustained high engine speeds?

- Ans**
- ☐ A. Improved noise insulation in the cabin
 - ☒ B. Enhanced exhaust gas flow at high rpm
 - ☐ C. Reduced exhaust temperature during operation
 - ☐ D. Increased overall engine size

Q.31 What is the primary function of a proportioning valve in a front disc, rear drum brake system?

- Ans**
- ☐ A. To restrict fluid pressure to the front brakes during hard braking
 - ☐ B. To increase fluid pressure to the rear brakes at all times
 - ☒ C. To restrict fluid pressure to the rear brakes during hard braking
 - ☐ D. To act as a warning device for brake failure

Q.32 Which practice best ensures driver safety during road testing of vehicles after major repairs?

- Ans**
- ☒ A. Following safety checks and wearing proper gear
 - ☐ B. Depending on previous records before the road test
 - ☐ C. Inspecting vehicle systems without using safety gear
 - ☐ D. Monitoring engine sounds during the complete test

Q.33 Which state does the refrigerant enter the compressor in an automobile HVAC system?

- Ans**
- ☐ A. High-pressure gas
 - ☐ B. High-pressure liquid
 - ☐ C. Low-pressure liquid
 - ☒ D. Low-pressure gas

Q.34 What does a higher octane rating in gasoline primarily indicate about the fuel?

- Ans**
- ☒ A. It resists knocking during combustion
 - ☐ B. It improves exhaust emission quality
 - ☐ C. It boosts the fuel energy content
 - ☐ D. It increases the engine cooling effect

Q.35 Which method is recommended for safely cleaning toxic dust from vehicle components in a workshop?

- Ans**
- ☐ A. Wiping by hand with cloth
 - ☐ B. Dry sweeping with a broom
 - ☐ C. Compressed air blowing
 - ☒ D. Vacuum cleaning equipment

Q.36 What principle does the height sensor use to function in an electronically controlled air suspension system?

- Ans**
- ☒ A. Pressure principle
 - ☒ B. Electromagnetic induction principle
 - ☒ C. Thermal expansion principle
 - ☒ D. Piezoelectric effect principle

Q.37 If the centrifugal advance mechanism fails and does not advance the ignition timing, what is a likely result?

- Ans**
- ☒ A. Engine may lose power at higher speeds
 - ☒ B. Engine will run at maximum efficiency
 - ☒ C. Engine will overheat quickly
 - ☒ D. Engine may lose power at lower speeds

Q.38 Which component supplies current to the rotor windings in most alternators?

- Ans**
- ☒ A. Voltage regulator unit
 - ☒ B. Ignition switch contacts
 - ☒ C. Diodes and rectifier
 - ☒ D. Slip rings and brushes

Q.39 If a mechanic finds that the engine does not start even though the battery is fully charged, which electrical connection or component should be checked next?

- Ans**
- ☒ A. Faulty ignition switch contacts
 - ☒ B. Blown main starter fuse
 - ☒ C. Loose battery terminal
 - ☒ D. Corroded solenoid switch connection

Q.40 A mechanic is diagnosing a vehicle with poor acceleration and suspects a fuel system issue. Which test would best confirm whether incorrect fuel pressure is the cause?

- Ans**
- ☒ A. Inspect the injectors for clogging and leaks
 - ☒ B. Listen for the fuel pump sound during ignition
 - ☒ C. Measure pressure at the rail and compare to specifications
 - ☒ D. Replace the fuel filter and observe improvement

Q.41 Why is torque specification important when tightening bolts during diesel engine assembly?

- Ans**
- ☒ A. It ensures that the hand tightening alone is always sufficient for all bolts to meet torque specifications
 - ☒ B. It ensures that any arbitrary amount of torque can be applied manually to achieve bolt tightening
 - ☒ C. It ensures bolts have a clearance fit with the nuts and saves time in assembly
 - ☒ D. It ensures bolts are neither too loose nor too tight for engine safety

Q.42 Which of the following is NOT a characteristic of extension lines?

- Ans**
- ☒ A. They are drawn thicker than visible lines
 - ☒ B. They extend beyond dimension lines
 - ☒ C. They are continuous without gaps
 - ☒ D. They are thin in appearance

Q.43 A fan runs for 6 hours per day and consumes the rated power of 75 watts. How much energy will it consume in two days?

- Ans**
- ☒ A. 75 watt-hours
 - ☒ B. 900 watt-hours
 - ☒ C. 150 watt-hours
 - ☒ D. 825 watt-hours

Q.44 Which piston ring is designed to maintain proper tension and fit of other rings in the groove?

- Ans**
- ☐ A. Scraper ring
 - ☐ B. Compression ring
 - ☐ C. Oil control ring
 - ☒ D. Expander ring

Q.45 Why is emery paper preferred over sandpaper for finishing metal surfaces in marking and measuring tasks?

- Ans**
- ☐ A. Emery paper produces less friction during use
 - ☒ B. Emery paper is harder and more durable
 - ☐ C. Emery paper absorbs oil better than sand paper
 - ☐ D. Emery paper is specifically designed for cleaning wood surfaces

Q.46 When might a diesel actuator require recalibration?

- Ans**
- ☐ A. When replacing tires
 - ☐ B. After new battery is fitted
 - ☐ C. When changing engine oil
 - ☒ D. After fuel system repairs

Q.47 Which technology ensures better fuel economy and emission control in modern petrol vehicles?

- Ans**
- ☐ A. Carburettor Fuel Supply system
 - ☐ B. Common Rail Direct Injection system
 - ☐ C. Single Point Fuel Injection system
 - ☒ D. Multi Point Fuel Injection system

Q.48 Which part of a depth micrometer ensures stable positioning during measurement?

- Ans**
- ☒ A. The broad base that rests on the surface
 - ☐ B. The ratchet that applies pressure
 - ☐ C. The thimble used to rotate the spindle
 - ☐ D. The spindle that extends downward

Q.49 Which exhaust emission produced from sulphur present in automotive fuel contributes significantly to acid rain formation?

- Ans**
- ☐ A. Nitrogen oxides
 - ☐ B. Unburnt hydrocarbons
 - ☒ C. Sulphur oxides
 - ☐ D. Carbon monoxide

Q.50 Which of the following workshop observations would suggest a steering column is NOT collapsible?

- Ans**
- ☐ A. It uses an intermediate collapsible piece
 - ☒ B. It is built from one continuous solid rod
 - ☐ C. It is divided into several connected parts
 - ☐ D. It has a flexible joint near the base

Q.51 On a technical drawing, the intersection of two axes commonly represents what?

- Ans**
- ☐ A. The hole diameter
 - ☐ B. The material specification
 - ☒ C. The center point of a part
 - ☐ D. The surface finish type

Q.52 If spurt holes are blocked, what is the most likely immediate effect on engine operation?

Ans

- ☒ A. Rapid increase in coolant flow to cylinder walls
- ☒ B. Increased friction in moving engine components
- ☒ C. Sudden improvement in fuel combustion quality
- ☒ D. Immediate rise in oil pressure throughout the system

Q.53 Which tool is typically used to tighten fittings on refrigerant hoses?

Ans

- ☒ A. Screwdriver or tester
- ☒ B. Hammer or mallet
- ☒ C. Wrench or spanner
- ☒ D. File or rasp

Q.54 Which engine problem is indicated by high carbon monoxide levels in the exhaust?

Ans

- ☒ A. Air-fuel mixture is too rich in the engine
- ☒ B. Poor tire alignment during operation
- ☒ C. Worn spark plugs in the ignition system
- ☒ D. Low coolant level in the radiator

Q.55 How is the air gap between the brake pads and the disc restored when the brake is released in a floating caliper disc brake?

Ans

- ☒ A. By the force of the piston sealing ring
- ☒ B. By renewed hydraulic pressure
- ☒ C. By the outer brake pad spring
- ☒ D. By the motion of the locating studs

Q.56 How does a worn-out piston ring influence hydrocarbon emissions in the exhaust?

Ans

- ☒ A. Improves engine compression
- ☒ B. Allows unburnt fuel to enter exhaust
- ☒ C. Filters hydrocarbons from exhaust
- ☒ D. Reduces emission temperature

Q.57 A vehicle battery repeatedly becomes discharged while driving. Which charging system component is most likely faulty?

Ans

- ☒ A. Ignition coil producing weak spark during ignition
- ☒ B. Starter motor causing delayed engine cranking
- ☒ C. Fuel pump reducing fuel supply to the engine
- ☒ D. Alternator failing to charge the battery properly

Q.58 The abbreviation SMF in SMF battery refers to:

Ans

- ☒ A. Stored Mechanical Force
- ☒ B. Sealed Maintenance Free
- ☒ C. Semi Metallic Frame
- ☒ D. Standard Magnetic Fuse

Q.59 Why is it important for the oil cooler to maintain the oil at an optimal temperature range?

Ans

- ☒ A. To prevent the oil from changing its color during operation.
- ☒ B. To ensure the oil maintains proper viscosity for lubrication.
- ☒ C. To cool the combustion gases in the engine cylinders.
- ☒ D. To increase the oil level in the crankcase automatically.

Q.60 What is indicated if the parking lamp glows continuously in a vehicle with ABS and Electronic Brake-force Distribution (EBD)?

- Ans**
- ☒ A. Low Brake fluid level
 - ☒ B. Defective EBD operation
 - ☒ C. A door is left open
 - ☒ D. Normal EBD operation

Q.61 When the accelerator pedal is fully depressed, what happens during kick-down operation in an automatic transmission?

- Ans**
- ☒ A. A higher gear is selected to save fuel
 - ☒ B. A lower gear is selected to increase acceleration
 - ☒ C. The transmission is disengaged to coast
 - ☒ D. The current gear is maintained for stability

Q.62 If the secondary winding of an ignition coil has an open circuit or poor ground connection, what is the most likely effect?

- Ans**
- ☒ A. The high voltage spark will not be generated efficiently
 - ☒ B. Engine will misfire
 - ☒ C. The high voltage spark will be generated efficiently
 - ☒ D. The primary winding voltage will increase

Q.63 Why is it important for the thermostat to begin opening at a specific temperature during engine operation?

- Ans**
- ☒ A. Ensures engine reaches and maintains optimal temperature
 - ☒ B. Closes only when temperature exceeds safe limit
 - ☒ C. Permits random coolant flow regardless of heat
 - ☒ D. Allows thermostat to remain fully open at all times

Q.64 Which of the following is a sign of a faulty starter solenoid?

- Ans**
- ☒ A. Engine cranks faster than normal
 - ☒ B. Strong fuel smell during ignition
 - ☒ C. Clicking sound but engine does not turn over
 - ☒ D. Dashboard lights are brighter than normal

Q.65 Which part of the rack and pinion steering system is responsible for moving the rack?

- Ans**
- ☒ A. The steering wheel
 - ☒ B. The wheels
 - ☒ C. The track-rod
 - ☒ D. The pinion

Q.66 If two vehicles have the same motor but one carries more passengers, which will need higher tractive effort on the same road?

- Ans**
- ☒ A. Vehicle with different tyre tread pattern
 - ☒ B. Vehicle with newer battery brand
 - ☒ C. Vehicle with brighter paint color
 - ☒ D. Vehicle with more passengers

Q.67 To improve both engine efficiency and emission control in a diesel engine, which piston ring function must be prioritized during maintenance?

- Ans**
- ☒ A. Maintaining piston lubrication and cooling efficiency
 - ☒ B. Improving piston alignment and minimizing noise
 - ☒ C. Ensuring proper sealing of combustion gases and oil regulation
 - ☒ D. Increasing piston speed and reducing heat buildup

Q.68 Which part connects the electric motor to the wheels in an electric vehicle?

- Ans**
- ☐ A. Air conditioning unit
 - ☒ B. Transmission system
 - ☐ C. Tail light
 - ☐ D. Display panel

Q.69 Which part of a composite headlight is most likely to be made from plastic rather than glass?

- Ans**
- ☐ A. Reflector
 - ☐ B. Bulb
 - ☐ C. Holder
 - ☒ D. Lens

Q.70 In a workshop calculation, you need to find the side of a square base with an area of 64 cm². What is the correct length?

- Ans**
- ☒ A. The side of the base is 8 cm
 - ☐ B. The side of the base is 6 cm
 - ☐ C. The side of the base is 7 cm
 - ☐ D. The side of the base is 9 cm

Q.71 When adjusting the speed of a drilling machine, what is generally decreased for harder materials?

- Ans**
- ☐ A. The feed rate of the material
 - ☐ B. The depth of the hole drilled
 - ☒ C. The rotational speed of the drill
 - ☐ D. The length of the drill tool

Q.72 Which type of vehicle commonly uses **Liquefied Petroleum Gas (LPG)** as its primary fuel source?

- Ans**
- ☐ A. Heavy trucks
 - ☒ B. City taxi cabs
 - ☐ C. High-performance sports cars
 - ☐ D. Agricultural tractors

Q.73 A technician lifts a box using a hoist. What type of energy is primarily involved in lifting?

- Ans**
- ☐ A. Chemical energy
 - ☐ B. Electrical energy
 - ☒ C. Potential energy
 - ☐ D. Kinetic energy

Q.74 Which unit assists the clutch in performing gear shifts in automatic transmissions?

- Ans**
- ☐ A. Planetary gear sets
 - ☐ B. Steering column linkage
 - ☐ C. Brake pad system
 - ☒ D. Torque converter assembly

Q.75 A ballast resistor is used in a circuit to:

- Ans**
- ☒ A. Limit circuit current to a safe value
 - ☐ B. Convert AC into DC
 - ☐ C. Increase supply voltage
 - ☐ D. Store electrical energy

