



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 Tractor

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

Q.2 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. 4 - 16 - 8 - 4
 - ☒ B. 5 - 25 - 15 - 7
 - ☒ C. 12 - 144 - 62 - 31
 - ☒ D. 8 - 64 - 32 - 14

Q.3 Which of the following is both, an input and output device?

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

Q.4 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. 7.0 meters per second
 - ☒ B. 7.5 meters per second
 - ☒ C. 6.5 meters per second
 - ☒ D. 8.0 meters per second

Q.5 Which of the following scenarios best demonstrates the conversion of chemical energy to mechanical energy?

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

Q.6 Which of the following statements correctly reflects the characteristics of a Local Area Network (LAN) and the role of Ethernet within it?

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

Q.7 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

Q.8 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?

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

- Ans**
- ☒ A. 44
 - ☐ B. 42
 - ☐ C. 48
 - ☐ D. 46

Q.9 A thermometer shows a reading of 37 degrees Celsius. What is the corresponding temperature in Kelvin?

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

Q.10 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. 27
 - ☐ D. 53

Q.11 Which of the following best defines 'work' in physics?

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

Q.12 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. BG – EJ
 - ☐ C. AF – DI
 - ☐ D. DJ – GM

Q.13 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. R
 - ☐ B. P
 - ☐ C. Q
 - ☒ D. S

Q.14 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. 5.56 hours
 - ☒ B. 6.55 hours
 - ☐ C. 9.45 hours
 - ☐ D. 3.33 hours

Q.15 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 remains at 2.5 seconds
 - ☐ B. It has decreased to 1.5 seconds
 - ☒ C. It has increased to 3.0 seconds
 - ☐ D. It has decreased to 2.0 seconds

Q.16 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's sister
 - ☐ B. Son's wife
 - ☐ C. Mother's mother
 - ☒ D. Son's wife's mother

Q.17 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 the same on both the Moon and Earth
 - ☒ B. The object weighs less on the Moon than on Earth
 - ☐ C. The object weighs zero on the Moon
 - ☐ D. The object weighs more on the Moon than on Earth

Q.18 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. ₹6,000
 - ☐ C. ₹5,000
 - ☐ D. ₹8,000

Q.19 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 kilometer per hour.
 - ☒ B. Average velocity is the total displacement divided by total time, and its unit is kilometer per hour.
 - ☒ C. Average velocity is the total displacement divided by total time, and its unit is meter per second.
 - ☒ D. Average velocity is the total distance divided by total time, and its unit is meter per second.

Q.20 If a scooter travels at a constant speed of 25 km per hour, how far will it travel in 4 hours?

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

Q.21 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. Only the rectangular base outline will be visible in the front view drawing
 - ☒ B. Only the triangular prism will be clearly visible in the front view drawing
 - ☒ C. The outline of rectangular base and triangular prism will be visible but hole is not shown
 - ☒ D. The outline of triangular prism and circular hole will be visible in front view only

Q.22 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. Include all features even those not visible from the selected side view
 - ☒ C. Use only hidden lines for representing features on the far side in the view
 - ☒ D. Project all visible elements from the side and omit hidden features unless needed

Q.23 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. 24.5
 - ☒ C. 23.5
 - ☒ D. 20.5

Q.24 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. NDO
 - ☒ B. OCP
 - ☒ C. PDP
 - ☒ D. NBQ

Q.25 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. A
 - ☒ B. Z
 - ☒ C. X
 - ☒ D. C

Q.26 Which feature is a requirement of the BIS drawing standard in engineering drawings?

Ans ☒ A. Title block with specific information

☒ B. Margin lines of random width

☒ C. Use of colored pencils for clarity

☒ D. Freehand sketches without scale

Q.27 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. ₹72,624

☒ B. ₹73,624

☒ C. ₹74,624

☒ D. ₹72,604

Q.28 What is the primary function of a fire hydrant in a workplace safety system?

Ans ☒ A. Detecting smoke and warning employees

☒ B. Supplying large quantities of water to fight fires

☒ C. Removing hazardous fumes from the area

☒ D. Activating fire alarms automatically in emergencies

Q.29 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 A 16 C 3 B 12 D 4 = ?

Ans ☒ A. 70

☒ B. 72

☒ C. 71

☒ D. 73

Q.30 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. None

☒ B. Four

☒ C. Three

☒ D. Two

Q.31 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 represents a small area with both length and width.

☒ C. A point is a short line segment used to mark measurements.

☒ D. A point is the intersection of two lines and always has measurable length.

Q.32 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. Mother's sister
 - ☐ D. Father's sister

Q.33 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. 6.7 km/h north
 - ☐ B. 33.3 km/h north
 - ☐ C. 20 km/h south
 - ☐ D. 0 km/h

Q.34 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. $\sin A - \cos A$
 - ☐ C. 1
 - ☐ D. 0

Q.35 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.36 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. Three
 - ☐ B. Four
 - ☒ C. Two
 - ☐ D. One

Q.37 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. HIZ 30
 - ☐ B. JHZ 24
 - ☐ C. IHS 23
 - ☒ D. IGA 25

Q.38 What should come in place of the question mark (?) in the given series?

74, 83, 101, 128, ?, 209

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

Q.39 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. 93
 - ☒ B. 82
 - ☐ C. 99
 - ☐ D. 98

Q.40 When using a hand file during fitting operations, which action demonstrates adherence to tool safety protocols?

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

Q.41 What is the main purpose of ambient air quality standards?

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

Q.42 What is an email used for?

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

Q.43 The average of 8 numbers is 45. If one number, 59, is removed, what will the new average be?

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

Q.44 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. 9865
 - ☐ B. 8956
 - ☐ C. 9568
 - ☒ D. 9856

Q.45 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. 78
 - ☐ B. 732
 - ☒ C. 84
 - ☐ D. 729

Q.46 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. 50 km/h north
 - ☐ C. 40 km/h east
 - ☒ D. 20 km/h east

Q.47 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?

$$14 \text{ A } 30 \text{ B } 45 \text{ C } 15 \text{ D } 9 = ?$$

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

Q.48 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. Data in statement I alone is sufficient to answer the question while data in statement II is not
 - ☐ B. Data in statement II alone is sufficient to answer the question while data in statement I 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. Both statements I and II together are NOT sufficient to answer the question.

Q.49 If $\left(x + \frac{1}{x}\right) = 3$, find the value of $\left(x^3 + \frac{1}{x^3}\right)$.

- Ans**
- ☐ A. 16
 - ☒ B. 18
 - ☐ C. 20
 - ☐ D. 15

Q.50 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. Both conclusions (I) and (II) follow
 - ☐ B. Only conclusion (II) follows
 - ☐ C. Neither conclusion (I) nor (II) follows
 - ☒ D. Only conclusion (I) follows

Q.51 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. EY-KO
 - ☒ B. QK-VA
 - ☐ C. TN-ZD
 - ☐ D. WQ-CG

Q.52 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 (I) follows
 - ☒ C. Neither conclusion (I) nor (II) follows
 - ☒ D. Only conclusion (II) follows

Q.53 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 sliding repeatedly across a rough abrasive machine surface during work
 - ☒ 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 touching a hot metallic machine surface during maintenance activity

Q.54 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. IJVJ
 - ☒ B. HKVJ
 - ☒ C. IKUH
 - ☒ D. HJVI

Q.55 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. V
 - ☒ B. S
 - ☒ C. Q
 - ☒ D. P

Q.56 Solve the system of equations:

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

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

Q.57 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. 240,000 joules
 - ☐ C. 24,000 joules
 - ☐ D. 12,000 joules

Q.58 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 240 km per hour since that was the odometer reading at 9:30 am.
 - ☐ B. The car's average speed is 180 km per hour since that was the odometer reading at 8:00 am.
 - ☒ C. The car's average speed is 40 km per hour as calculated from the odometer readings and time interval.
 - ☐ D. The car's average speed is 60 km per hour based only on the change in odometer readings.

Q.59 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 saved to a new file.
 - ☐ B. The selected cells are deleted from the original worksheet.
 - ☒ C. The selected cells are copied to the new worksheet.
 - ☐ D. The selected cells are moved to the new worksheet.

Q.60 What is the best description of the purpose of multi-view drawing in engineering drawing?

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

Q.61 Which integrated strategy best addresses soil pollution, falling crop yields, and low microbial activity near an industrial zone?

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

Q.62 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. 48 kg
 - ☒ C. 50 kg
 - ☐ D. 45 kg

Q.63 What do touch gestures in Microsoft Windows allow users to do?

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

Q.64 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. Both statements I and II together (and not statement I alone or statement II alone) are sufficient to answer the question
 - ☒ B. Both statements I and II together are NOT sufficient to answer the question
 - ☒ C. Data in statement I alone is sufficient to answer the question while data in statement II is not
 - ☒ D. Data in statement II alone is sufficient to answer the question while data in statement I is not

Q.65 What should come in place of the question mark (?) in the given series?

98, 104, 116, 134, 158, ?

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

Q.66 Which of the following best describes a key environmental concern associated with improper disposal of e-waste?

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

Q.67 In how many years will a sum of ₹16,000 at 10% per annum compounded semi-annually become ₹18,522?

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

Q.68 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. 7
 - ☒ B. 2
 - ☒ C. 9
 - ☒ D. 4

Q.69 Which approach most effectively reduces both nitrogen and phosphorus concentrations during wastewater treatment?

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

Q.70 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. Validate the analysis using workplace data
 - ☒ B. Define the top event representing the injury
 - ☒ C. Establish preventive measures to control risks
 - ☒ D. List all possible causes of failures

Q.71 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 30 K.
 - ☒ B. The temperature change is 20 K.
 - ☒ C. The temperature change is 15 K.
 - ☒ D. The temperature change is 50 K.

Q.72 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. 3
 - ☒ B. 0
 - ☒ C. 2
 - ☒ D. 1

Q.73 A runner completes one lap of a 200 meter circular track in 50 seconds. What is the average speed of the runner?

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

Q.74 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. $\sqrt{117}$ cm
 - ☒ C. $\sqrt{97}$ cm
 - ☒ D. $\sqrt{107}$ cm

Q.75 When a moving car suddenly applies brakes, its kinetic energy is transformed mainly into which form of energy?

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

Q.76 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. 7.5 hours
 - ☒ B. 8 hours
 - ☒ C. 10 hours
 - ☒ D. 6 hours

Q.77 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. Four
 - ☐ B. One
 - ☐ C. Two
 - ☒ D. Three

Q.78 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. ₹12,000
 - ☐ B. ₹10,000
 - ☐ C. ₹9,000
 - ☐ D. ₹11,000

Q.79 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. 22.6% profit
 - ☐ B. 15.7% profit
 - ☐ C. 20.9% profit
 - ☒ D. 26.5% loss

Q.80 Which situation best describes an entanglement hazard in a mechanical workshop?

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

Q.81 Find the LCM of 72, 78, and 90.

- Ans**
- ☒ A. 4680
 - ☐ B. 4250
 - ☐ C. 4120
 - ☐ D. 4280

Q.82 Which property of a fuse wire ensures it melts quickly when excess current flows?

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

Q.83 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. 5
 - ☐ B. 6
 - ☐ C. 4
 - ☐ D. 7

Q.84 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. 45.3 km/h
 - ☒ B. 46.5 km/h
 - ☒ C. 48.6 km/h
 - ☒ D. 45.8 km/h

Q.85 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. 4000 mm
 - ☒ C. 4 m
 - ☒ D. 400 cm

Q.86 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. Q
 - ☒ B. P
 - ☒ C. R
 - ☒ D. S

Q.87 Which line symbol is commonly used in engineering drawings to represent a hidden edge that is not directly visible?

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

Q.88 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. 0 J
 - ☒ B. 1000 J
 - ☒ C. 500 J
 - ☒ D. 50 J

Q.89 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-East
 - ☒ B. South-West
 - ☒ C. South-East
 - ☒ D. North-West

Q.90 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. 13.7%
 - ☒ C. 12.6%
 - ☒ D. 13.0%

Q.91 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. 4 days
 - ✗ B. 8 days
 - ✗ C. 6 days
 - ✗ D. 5 days

Q.92 Simplify: $60 - \{(-8) \times (-16 - 19 - 2)\} \div [5 \times \{2 + (-1) \times (-1)\}]$

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

Q.93 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. Law of conservation of energy
 - ✗ B. Law of inertia
 - ✗ C. Principle of inertia
 - ✗ D. Principle of superposition

Q.94 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. STMWV
 - ✓ B. WRNYT
 - ✗ C. TSNWW
 - ✗ D. WSNYT

Q.95 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. Prioritizing uniform wall thickness over all other features
 - ✗ B. Focusing only on base diameter for precise fit
 - ✓ C. Ensuring the slant height matches the assembly requirement
 - ✗ D. Matching only the overall height of the cone

Q.96 Which component makes up the largest proportion of Earth's atmosphere by volume?

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

Q.97 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. FMT : IQY
 - ☒ B. VCD : GRD
 - ☒ C. XDE : PON
 - ☒ D. CGW : NHT

Q.98 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 cm³) of the cylinder?

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

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

Q.99 In third angle projection, where is the object placed relative to the plane of projection?

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

Q.100 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. Use only standard orthographic projection without auxiliary views
 - ☒ C. Draw a simple circle at the junction in the top view
 - ☒ D. Draw the true shape of the intersection using auxiliary projection

Section : PART-B

Q.1 A digital multimeter measures current by developing a proportional voltage across a:

- Ans**
- ☒ A. Transformer winding
 - ☒ B. Relay coil
 - ☒ C. Shunt resistance
 - ☒ D. Capacitor plate

Q.2 Which symptom indicates the presence of bad brake fluid?

- Ans**
- ☒ A. Sudden steering stiffness
 - ☒ B. Soft or spongy brake pedal
 - ☒ C. Rapid loss of tire pressure
 - ☒ D. Increase in engine knocking sound

Q.3 Which of these conditions can cause reading errors in a dial indicator?

- Ans**
- ☒ A. Parallax error
 - ☐ B. Zero error elimination
 - ☐ C. Automatic error correction
 - ☐ D. Magnetic field immunity

Q.4 If a force acts on a body but no displacement occurs, the work done is:

- Ans**
- ☐ A. Maximum
 - ☐ B. Negative always
 - ☐ C. Infinite
 - ☒ D. Zero

Q.5 How does the construction of multilayer metallic gaskets benefit their use in engines with frequent load changes?

- Ans**
- ☐ A. They provide insulation from engine heat
 - ☒ B. They compensate for flange movement during operation
 - ☐ C. They reduce the need for joint lubrication
 - ☐ D. They prevent corrosion of fasteners

Q.6 What is typically achieved by using a lower gear in a tractor manual transmission?

- Ans**
- ☒ A. Increased torque at the wheels
 - ☐ B. Decreased torque and higher speed
 - ☐ C. Lower engine temperature
 - ☐ D. Increased fuel tank capacity

Q.7 Which statement correctly differentiates heat and temperature based on their SI units?

- Ans**
- ☐ A. Both heat and temperature are measured in kelvin
 - ☒ B. Heat is measured in joule while temperature is measured in kelvin
 - ☐ C. Both heat and temperature are measured in joule
 - ☐ D. Heat is measured in kelvin while temperature is measured in joule

Q.8 What could happen if incompatible brake fluids are mixed in a tractor?

- Ans**
- ☐ A. Cooling system may overheat rapidly
 - ☐ B. Engine oil pressure may drop sharply
 - ☒ C. Seals may be damaged and braking performance may be reduced
 - ☐ D. Hydraulic lift arms may move slowly

Q.9 Which of the following best describes the relationship between the radiator pressure cap and coolant loss prevention?

- Ans**
- ☒ A. It keeps coolant from boiling and escaping as vapor
 - ☐ B. It blocks debris from entering the radiator
 - ☐ C. It restricts airflow into the engine compartment
 - ☐ D. It adds coolant to the reservoir automatically

Q.10 In an NPN transistor operating in cut-off region, what happens to the collector current?

- Ans**
- ☐ A. Collector current becomes half of the rated value
 - ☐ B. Collector current reaches maximum value
 - ☒ C. Collector current becomes zero or only leakage current flows
 - ☐ D. Collector current continuously increases with temperature

Q.11 How does MoRTH (Ministry of Road Transport and Highways) impact the safety of road users in India?

- Ans**
- ☐ A. Inspecting railway tracks for safety
 - ☐ B. Regulating vehicle insurance companies
 - ☒ C. Implementing road safety measures
 - ☐ D. Issuing driving licenses to citizens

Q.12 In third angle projection, the object lies:

- Ans**
- ☐ A. Above Horizontal Plane (H.P.) and in front of Vertical Plane (V.P.)
 - ☒ B. Below Horizontal Plane (H.P.) and behind Vertical Plane (V.P.)
 - ☐ C. Above Horizontal Plane (H.P.) and behind Vertical Plane (V.P.)
 - ☐ D. Below Horizontal Plane (H.P.) and in front of Vertical Plane (V.P.)

Q.13 Which innovation most significantly increased mass production in the early automobile industry?

- Ans**
- ☐ A. Steam-powered engines
 - ☐ B. Handcrafted carriages
 - ☐ C. Wooden chassis frames
 - ☒ D. Moving assembly line

Q.14 Why is a gear type oil pump used more commonly than a plunger type in diesel engines?

- Ans**
- ☐ A. Plunger type cannot withstand high temperatures
 - ☒ B. Gear type offers continuous and reliable flow
 - ☐ C. Gear type is more suitable for small engines
 - ☐ D. Plunger type operates at lower speeds

Q.15 When refueling a hot diesel engine, what is the safest practice?

- Ans**
- ☐ A. Add fuel quickly to avoid delays
 - ☐ B. Open radiator cap before refueling
 - ☐ C. Refuel with engine running to save time
 - ☒ D. Allow the engine to cool before refueling

Q.16 A worker notices clutter blocking an emergency exit. What is the best immediate course of action according to good housekeeping practices?

- Ans**
- ☐ A. Wait for a supervisor to give instructions
 - ☐ B. Move the clutter to another part of the workshop
 - ☒ C. Remove the clutter and report the hazard
 - ☐ D. Ignore the clutter and continue working

Q.17 Which component transmits power from the engine to implements in a power tiller?

- Ans**
- ☐ A. Front stand
 - ☒ B. Power take off shaft
 - ☐ C. Steering lever
 - ☐ D. Main clutch lever

Q.18 A tractor operator notices that the wheels are not turning equally when steering. Which component is likely malfunctioning?

- Ans**
- ☐ A. Fuel pump is not maintaining pressure properly
 - ☐ B. Axle lubrication is insufficient for smooth motion
 - ☒ C. A linkage may not be transmitting motion correctly
 - ☐ D. Steering wheel grip has worn out over time

Q.19 Two ideal capacitors of $6\ \mu\text{F}$ and $3\ \mu\text{F}$ are connected in series. Their equivalent capacitance is:

- Ans**
- ☐ A. $18\ \mu\text{F}$
 - ☒ B. $2\ \mu\text{F}$
 - ☐ C. $1\ \mu\text{F}$
 - ☐ D. $9\ \mu\text{F}$

Q.20 Which type of tyre tread pattern has teeth-like edges?

- Ans**
- ☐ A. Lug tread
 - ☐ B. Diamond tread
 - ☒ C. Saw tooth tread
 - ☐ D. Highway tread

Q.21 What is the remedy for a loose drive belt causing charging problems?

- Ans**
- ☐ A. Replace battery terminal
 - ☐ B. Replace stator winding
 - ☒ C. Adjust belt tension
 - ☐ D. Tighten wheel bolts

Q.22 How does the differential lock affect the motion of the drive wheels?

- Ans**
- ☐ A. It automatically adjusts air pressure in the tires
 - ☐ B. It makes one drive wheel rotate in reverse
 - ☒ C. It forces both drive wheels to rotate at the same speed
 - ☐ D. It causes one wheel to stop rotating in all cases

Q.23 What does the compensation port in a master cylinder do during brake release?

- Ans**
- ☐ A. Seals the piston from dust
 - ☒ B. Releases pressure to the reservoir
 - ☐ C. Closes to block air entry
 - ☐ D. Opens to maintain fluid level

Q.24 A mechanic is repairing a gearbox and finds the original gasket is missing. Which approach would best replace the function of the missing gasket?

- Ans**
- ☐ A. Wrap with adhesive tape around the joint
 - ☒ B. Apply liquid gasket material to the mating faces
 - ☐ C. Use grease instead of a sealing material
 - ☐ D. Tighten the bolts as much as possible for fit

Q.25 In a tractor hydraulic system, where would you typically use a 2-2 way valve?

- Ans**
- ☐ A. For pressure-compensated flow division
 - ☒ B. For simple on/off fluid control applications
 - ☐ C. For proportional direction control
 - ☐ D. For controlling multiple actuators simultaneously

Q.26



Which type of bar section is represented in the given figure?

- Ans
- ☒ A. Channel bar section
 - ☐ B. Circular bar section
 - ☐ C. Flat bar section
 - ☐ D. Angle bar section

Q.27 How does the ball and socket joint contribute to the durability of a tractor's steering system?

- Ans
- ☐ A. Prevents any movement in the steering assembly
 - ☐ B. Increases friction for better grip in steering
 - ☒ C. Reduces wear by allowing free movement under load
 - ☐ D. Locks the steering components in place

Q.28 Why should piston rings be checked for cracks before fitting?

- Ans
- ☐ A. To reduce friction during operation
 - ☒ B. To avoid premature engine failure
 - ☐ C. To prevent carbon buildup on rings
 - ☐ D. To ensure smooth piston rotation

Q.29 Valve overlap in diesel engines is primarily used to:

- Ans
- ☒ A. Improve scavenging and cylinder filling
 - ☐ B. Decrease temperature in the cylinder
 - ☐ C. Clean the spark plugs automatically
 - ☐ D. Lubricate the crankshaft bearings

Q.30 Which of the following is a correct use of a centre punch during layout work?

- Ans
- ☐ A. Sharpening tool edges
 - ☐ B. Measuring sheet thickness
 - ☐ C. Tightening bolts and nuts
 - ☒ D. Creating indentation for drill bit

Q.31 What is a non-functional dimension?

- Ans
- ☐ A. A hidden dimension used in sectional views
 - ☐ B. A dimension essential for assembly operation
 - ☒ C. A dimension not essential for the function of the component
 - ☐ D. A dimension related only to colour finishing

Q.32 Which of the following does the camshaft use to convert rotational motion into linear motion for valve operation?

- Ans
- ☒ A. Cam lobes
 - ☐ B. Bearings
 - ☐ C. Pulleys
 - ☐ D. Gears

Q.33 Which feature distinguishes a centre punch from a prick punch in terms of construction?

- Ans**
- ☒ A. Knurled hand grip
 - ☒ B. Blunter point angle
 - ☒ C. Steel material body
 - ☒ D. Longer overall length

Q.34 Which factor has contributed most significantly to the growth of the tractor industry in India in recent years?

- Ans**
- ☒ A. Mechanization of agriculture has increased
 - ☒ B. Urbanization has remained constant
 - ☒ C. Manual labor availability has declined
 - ☒ D. Export demand for tractors has decreased

Q.35 A workshop must finish ceramic parts with extremely tight tolerances and mirror-like surfaces. Which lapping abrasive should be chosen?

- Ans**
- ☒ A. Silicon carbide cream
 - ☒ B. Aluminum oxide powder
 - ☒ C. Diamond paste
 - ☒ D. Boron carbide slurry

Q.36 Why are tractor wheels often larger at the rear compared to those at the front?

- Ans**
- ☒ A. To reduce load on the engine
 - ☒ B. To improve stability and traction
 - ☒ C. To decrease tyre wear in fields
 - ☒ D. To enhance steering precision

Q.37 According to IS:1444-1989, which drawing board designation has size 1500 × 1000 × 25 mm?

- Ans**
- ☒ A. D1
 - ☒ B. D0
 - ☒ C. D2
 - ☒ D. D3

Q.38 Why is glass wool preferred over other materials for absorptive mufflers?

- Ans**
- ☒ A. Reflects sound waves efficiently
 - ☒ B. Prevents corrosion of the muffler shell
 - ☒ C. Acts as a filter for exhaust gases
 - ☒ D. Resists high temperatures

Q.39 Which cooling system is least suitable for use in areas with high humidity?

- Ans**
- ☒ A. Air cooling system
 - ☒ B. Evaporative cooling system
 - ☒ C. Dry cooling system
 - ☒ D. Liquid cooling system

Q.40 A student marks a line with a scribe, but the line is barely visible. What might be the most likely cause?

- Ans**
- ☒ A. Metal surface is too oily
 - ☒ B. Scribe tip is blunt or worn out
 - ☒ C. Measuring tape was used instead
 - ☒ D. Ruler engravings are faint

Q.41 In overhead transmission lines, insulators are used to:

- Ans**
- ☒ A. Prevent leakage current to earth
 - ☐ B. Increase conductor current
 - ☐ C. Produce magnetic shielding
 - ☐ D. Reduce conductor resistance

Q.42 Which of the following is NOT an effect of heat?

- Ans**
- ☐ A. Change in state
 - ☐ B. Change in temperature
 - ☒ C. Change in gravitational force
 - ☐ D. Change in size

Q.43 Which valve must close tightly to ensure proper compression in a diesel engine?

- Ans**
- ☐ A. Only inlet valve
 - ☐ B. Only exhaust valve
 - ☐ C. Only fuel injector
 - ☒ D. Both Inlet and exhaust valves

Q.44 Which maintenance problem is linked to overloading tractor implements during field work?

- Ans**
- ☐ A. Slower battery discharge rate
 - ☒ B. Frequent bolt loosening in joints
 - ☐ C. Cleaner hydraulic fluid lines
 - ☐ D. Lower grease consumption rates

Q.45 Which application is most suitable for brazed joints rather than welded joints in industrial manufacturing?

- Ans**
- ☒ A. Brazed joints are ideal for joining thin-walled copper tubes.
 - ☐ B. Brazed joints are ideal for fusing thick aluminum sheets.
 - ☐ C. Brazed joints are ideal for connecting heavy steel plates.
 - ☐ D. Brazed joints are ideal for assembling large cast iron components.

Q.46 What causes ignition in a compression ignition engine?

- Ans**
- ☐ A. External flame
 - ☐ B. Spark plug activation
 - ☒ C. High temperature of compressed air
 - ☐ D. Low temperature of compressed air

Q.47 When smoothing a rough metal surface, which file type would provide a faster finish?

- Ans**
- ☐ A. Rasp file
 - ☒ B. Double cut file
 - ☐ C. Triangular file
 - ☐ D. Single cut file

Q.48 What is the suggested remedy for a faulty regulator in an alternator?

- Ans**
- ☒ A. Replace
 - ☐ B. Tighten
 - ☐ C. Rectify
 - ☐ D. Lubricate

Q.49 Which statement best describes the construction of a double ended hydraulic cylinder?

- Ans**
- ☐ A. Contains two pistons in one tube assembly
 - ☐ B. Has a rod only on one side of the cylinder
 - ☐ C. Uses a single central seal for both chambers
 - ☒ D. Has piston rods extending from both sides of the cylinder

Q.50 If you must recommend a fit up inspection step for a complex joint in gas welding, which would ensure the highest joint integrity?

- Ans**
- ☐ A. Inspecting only the joint surface cleanliness
 - ☐ B. Checking only the alignment of pieces
 - ☒ C. Checking both alignment and uniform gap
 - ☐ D. Measuring only the uniformity of gap

Q.51 When troubleshooting oil pressure drops, why should the oil filter be inspected?

- Ans**
- ☐ A. A filter can control coolant circulation
 - ☐ B. A filter can affect alternator output
 - ☒ C. A blocked filter can cause low oil pressure
 - ☐ D. A filter can cause air leaks in tires

Q.52 A control circuit must implement the logic function $Y = (A \cdot B) + C$. How should the switches be connected?

- Ans**
- ☒ A. Switches A and B are wired in series, and this entire branch is wired in parallel with Switch C.
 - ☐ B. Switches A and B are wired in parallel, and this entire branch is wired in series with Switch C.
 - ☐ C. All three switches (A, B, and C) must be wired in a single common parallel block.
 - ☐ D. All three switches (A, B, and C) must be wired in a continuous single series line.

Q.53 Why do cushion springs help reduce wear on clutch components?

- Ans**
- ☐ A. They increase the thickness of clutch plates
 - ☐ B. They improve the heat resistance of the clutch
 - ☐ C. They reduce the need for lubrication
 - ☒ D. They distribute engagement force more evenly

Q.54 The hitching device mainly helps in:

- Ans**
- ☐ A. Wheel balancing
 - ☐ B. Fuel injection
 - ☐ C. Engine lubrication
 - ☒ D. Implement attachment

Q.55 Why are bearing shells designed with a specific thickness and shape in diesel engines?

- Ans**
- ☐ A. To increase coolant speed
 - ☒ B. To ensure proper load distribution
 - ☐ C. To maximize fuel injection
 - ☐ D. To optimize exhaust gas flow

Q.56 In a practical scenario, why might a technician choose a reactive muffler over an absorptive one?

- Ans**
- ☒ A. It is more effective at reducing low-frequency engine sounds
 - ☐ B. It increases engine power output
 - ☐ C. It needs less maintenance over time
 - ☐ D. It lasts longer in high-temperature environments

Q.57 A student needs to drill several identical holes in a metal plate using a bench drilling machine. Which feature would help achieve consistent results?

- Ans**
- ☐ A. Adjusting the table height for each hole
 - ☒ B. Using the depth stop to control drilling depth
 - ☐ C. Changing the drill bit after each hole
 - ☐ D. Varying the feed pressure continuously

Q.58 Which part of the Vernier caliper is used to measure inside diameters?

- Ans**
- ☐ A. Depth rod
 - ☐ B. Locking screw
 - ☒ C. Upper jaws
 - ☐ D. Lower jaws

Q.59 During discharging of lead acid battery, which substance is formed at both battery plates?

- Ans**
- ☐ A. Lead bromide
 - ☐ B. Lead carbonate
 - ☒ C. Lead sulfate
 - ☐ D. Lead acetate

Q.60 Which front axle type allows the wheels to move up and down independently to adapt to uneven ground?

- Ans**
- ☒ A. Oscillating front axle
 - ☐ B. Rigid front axle
 - ☐ C. Four-wheel drive front axle
 - ☐ D. Adjustable front axle

Q.61 In a real-life workshop scenario, how could improper use of a drill vice affect the outcome of a drilling operation?

- Ans**
- ☒ A. It may result in inaccurate holes and potential safety hazards
 - ☐ B. It increases the spindle speed automatically
 - ☐ C. It extends the life of the drill bit significantly
 - ☐ D. It makes the drilling machine operate more quietly

Q.62 A fitter is required to file the inner curvature of a pipe and its flat edge. Which file is most suitable?

- Ans**
- ☐ A. Flat file
 - ☐ B. Round file
 - ☐ C. Needle file
 - ☒ D. Half round file

Q.63 What safety concern is associated with a faulty high-pressure diesel fuel line?

- Ans**
- ☒ A. Risk of fuel spray
 - ☐ B. Coolant leakage risk
 - ☐ C. Risk of electrical short circuit
 - ☐ D. Emission of engine noise

Q.64 Which material is commonly used to manufacture diesel tanks in automobiles?

- Ans**
- ☐ A. Zinc
 - ☒ B. Mild steel
 - ☐ C. Copper
 - ☐ D. Cast iron

Q.65 A screw extractor failed to remove a broken screw because the hole was drilled off-center. What is the main risk in this situation?

- Ans**
- ☐ A. Breaking the screw extractor
 - ☐ B. Sticking the extraction tool
 - ☐ C. Softening the broken screw
 - ☒ D. Damaging the original threaded hole

Q.66 Which part supports the camshaft inside the engine block?

- Ans**
- ☐ A. Gears support the camshaft inside the engine block.
 - ☐ B. Springs support the camshaft inside the engine block.
 - ☒ C. Bearings support the camshaft inside the engine block.
 - ☐ D. Pulleys support the camshaft inside the engine block.

Q.67 Which process is directly managed by the camshaft in a diesel engine?

- Ans**
- ☐ A. Spark generation
 - ☐ B. Fuel atomization
 - ☒ C. Valve actuation
 - ☐ D. Coolant circulation

Q.68 In a tractor power tiller, which configuration is most likely to minimize power loss during transmission from the engine to wheel?

- Ans**
- ☒ A. Direct shaft drive with constant mesh gearing
 - ☐ B. Hydraulic transfer using single circuit fluid
 - ☐ C. Chain drive with variable pitch sprockets
 - ☐ D. Belt drive with adjustable tension pulleys

Q.69 How does the diameter of an exhaust pipe affect engine performance and efficiency?

- Ans**
- ☐ A. Larger size increases brake power
 - ☐ B. Smaller size improves air filtration
 - ☒ C. Proper size maintains optimal gas flow
 - ☐ D. Any size functions equally well

Q.70 What is the fraction form of $87\frac{1}{2}\%$?

- Ans**
- ☐ A. $\frac{15}{16}$
 - ☒ B. $\frac{7}{8}$
 - ☐ C. $\frac{5}{6}$
 - ☐ D. $\frac{11}{12}$

Q.71 A technician notices excessive smoke from a diesel engine. Which Electronic Control Unit (ECU)-related issue could cause this?

- Ans**
- ☐ A. Low tire pressure level
 - ☐ B. Faulty alternator output
 - ☐ C. Blocked air filter system
 - ☒ D. Incorrect fuel delivery

Q.72 Which sequence correctly represents the four-stroke cycle in a spark ignition engine?

- Ans**
- ☐ A. Suction, power, compression, exhaust
 - ☐ B. Suction, exhaust, compression, power
 - ☒ C. Suction, compression, power, exhaust
 - ☐ D. Suction, compression, exhaust, power

Q.73 What is the normal condition of the ignition warning lamp after the engine starts?

- Ans**
- ☐ A. It changes colour repeatedly
 - ☐ B. It continues glowing brightly
 - ☐ C. It flashes continuously
 - ☒ D. It turns off if charging is normal

Q.74 Which part works together with the camshaft to achieve variable valve timing?

- Ans**
- ☒ A. The valve actuator mechanism
 - ☐ B. The valve spring stiffness
 - ☐ C. The valve magnetic mechanism
 - ☐ D. The valve lubrication system

Q.75 While giving first aid for a suspected fracture, what is the most critical step before moving the injured person?

- Ans**
- ☐ A. Apply cold packs to reduce swelling
 - ☐ B. Check for bleeding and bandage the wound
 - ☒ C. Immobilize the injured area with a splint or support
 - ☐ D. Ask the person to move the injured part