



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 Diesel

* 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 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. 50 J
 - ☒ C. 500 J
 - ☒ D. 1000 J

Q.2 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. QK-VA
 - ☒ B. EY-KO
 - ☒ C. WQ-CG
 - ☒ D. TN-ZD

Q.3 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. South-West
 - ☒ B. South-East
 - ☒ C. North-West
 - ☒ D. North-East

Q.4 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.5 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.6 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. 9.45 hours
 - ☒ C. 3.33 hours
 - ☒ D. 6.55 hours

Q.7 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. 8956
 - ☒ B. 9568
 - ☒ C. 9865
 - ☒ D. 9856

Q.8 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. 0
 - ☒ B. $\sin A - \cos A$
 - ☒ C. $\cos A + \sin A$
 - ☒ D. 1

Q.9 If $\left(x + \frac{1}{x} \right) = 3$, find the value of $\left(x^3 + \frac{1}{x^3} \right)$.

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

Q.10 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. 120 km
 - ☒ C. 100 km
 - ☒ D. 80 km

Q.11 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. 6 days
 - ☒ C. 4 days
 - ☒ D. 5 days

Q.12 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. 45 kg
 - ☐ C. 48 kg
 - ☒ D. 50 kg

Q.13 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 inertia
 - ☐ B. Principle of superposition
 - ☐ C. Law of inertia
 - ☒ D. Law of conservation of energy

Q.14 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. CGW : NHT
 - ☐ B. XDE : PON
 - ☒ C. FMT : IQY
 - ☐ D. VCD : GRD

Q.15 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. ₹9,000
 - ☐ B. ₹11,000
 - ☒ C. ₹12,000
 - ☐ D. ₹10,000

Q.16 Which of the following statements correctly describes average velocity and its SI unit?

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

Q.17 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 increased to 3.0 seconds
 - ☐ B. It has decreased to 2.0 seconds
 - ☐ C. It has decreased to 1.5 seconds
 - ☐ D. It remains at 2.5 seconds

Q.18 When a moving car suddenly applies brakes, its kinetic energy is transformed mainly into which form of energy?

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

Q.19 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. 13.0%
 - ☒ D. 12.6%

Q.20 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 I alone is sufficient to answer the question while data in statement II is not
 - ☒ B. Both statements I and II together (and not statement I alone or statement II alone) are sufficient to answer the question
 - ☒ C. Data in statement II alone is sufficient to answer the question while data in statement I is not
 - ☒ D. Both statements I and II together are NOT sufficient to answer the question

Q.21 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. ₹74,624
 - ☒ C. ₹72,604
 - ☒ D. ₹72,624

Q.22 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.23 A thermometer shows a reading of 37 degrees Celsius. What is the corresponding temperature in Kelvin?

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

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

Q.25 Which integrated strategy best addresses soil pollution, falling crop yields, and low microbial activity near an industrial zone?

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

Q.26 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. 46
 - ☐ B. 42
 - ☒ C. 44
 - ☐ D. 48

Q.27 The average of 8 numbers is 45. If one number, 59, is removed, what will the new average be?

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

Q.28 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 becoming entangled in a rotating machine shaft during operation
 - ☐ C. A hand touching a hot metallic machine surface during maintenance activity
 - ☒ D. A hand caught between a moving blade and a fixed machine surface during operation

Q.29 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.30 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.31 What is an email used for?

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

Q.32 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. 71
 - ☒ C. 72
 - ☒ D. 73

Q.33 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. JHZ 24
 - ☒ C. HIZ 30
 - ☒ D. IGA 25

Q.34 Which approach most effectively reduces both nitrogen and phosphorus concentrations during wastewater treatment?

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

Q.35 Which situation best describes an entanglement hazard in a mechanical workshop?

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

Q.36 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 20 K.
 - ☒ C. The temperature change is 15 K.
 - ☒ D. The temperature change is 30 K.

Q.37 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. Establish preventive measures to control risks
 - ☒ B. Validate the analysis using workplace data
 - ☒ C. Define the top event representing the injury
 - ☒ D. List all possible causes of failures

Q.38 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. 240,000 joules
 - ☒ B. 480,000 joules
 - ☒ C. 24,000 joules
 - ☒ D. 12,000 joules

Q.39 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. 7
 - ☐ C. 2
 - ☐ D. 4

Q.40 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?

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

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

Q.41 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.42 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. ₹1,440
 - ☐ C. ₹1,200
 - ☐ D. ₹1,260

Q.43 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 present the object in a single three-dimensional visual form only
 - ☐ C. To show different colors of an object for better visual appearance
 - ☒ D. To represent different sides of an object clearly on a flat surface

Q.44 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. $x = 1, y = 2, z = 2$
 - ☐ C. $x = -2, y = 2, z = 11$
 - ☐ D. $x = 2, y = 1, z = -3$

Q.45 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. 27
 - ☒ B. 53
 - ☒ C. 39
 - ☒ D. 42

Q.46 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. 400 cm
 - ☒ B. 4 m
 - ☒ C. 4000 mm
 - ☒ D. 0.4 m

Q.47 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. $\sqrt{117}$ cm
 - ☒ B. $\sqrt{107}$ cm
 - ☒ C. $\sqrt{119}$ cm
 - ☒ D. $\sqrt{97}$ cm

Q.48 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 copied to the new worksheet.
 - ☒ C. The selected cells are moved to the new worksheet.
 - ☒ D. The selected cells are deleted from the original worksheet.

Q.49 Which of the following is both, an input and output device?

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

Q.50 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. DJ – GM
 - ☒ B. CH – EK
 - ☒ C. AF – DI
 - ☒ D. BG – EJ

Q.51 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. 45.8 km/h
 - ☒ D. 46.5 km/h

Q.52 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. 23.5
 - ☒ B. 24.5
 - ☐ C. 20.5
 - ☐ D. 25

Q.53 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. Include all features even those not visible from the selected side view
 - ☐ B. Sketch the side view freely without using projections from the main 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.54 Find the LCM of 72, 78, and 90.

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

Q.55 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 if a force acts at any angle to the motion.
 - ☐ C. Work is done when energy is stored in an object.
 - ☒ D. Work is done when a force moves an object in the direction of the force.

Q.56 What is the typical temperature range covered by a laboratory thermometer used in school experiments?

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

Q.57 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. 50 km/h north
 - ☐ B. 40 km/h east
 - ☒ C. 20 km/h east
 - ☐ D. 30 km/h east

Q.58 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 meter per second
 - ☐ B. 3.5 meter per second
 - ☐ C. 4.5 meter per second
 - ☐ D. 3 meter per second

Q.59 Which property of a fuse wire ensures it melts quickly when excess current flows?

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

Q.60 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. Q
 - ☐ C. R
 - ☐ D. S

Q.61 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. Only conclusion (I) follows
 - ☐ B. Neither conclusion (I) nor (II) follows
 - ☐ C. Both conclusions (I) and (II) follow
 - ☐ D. Only conclusion (II) follows

Q.62 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 is a standard that governs how devices in a LAN communicate via wired connections, supporting speeds from 10 Mbps to 1000 Mbps.
 - ☐ B. LANs are designed for long-distance communication and use Ethernet primarily for wireless data exchange.
 - ☐ C. A LAN always requires Gigabit Ethernet to function and is insecure because it allows open access to all network devices.
 - ☐ D. Ethernet in a LAN provides low-speed data transfer and connects users over public Internet infrastructure.

Q.63 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 I alone is sufficient to answer the question while data in statement II is not
 - ☒ C. Both statements I and II together are NOT sufficient to answer the question.
 - ☐ D. Data in statement II alone is sufficient to answer the question while data in statement I is not

Q.64 What is the primary function of a fire hydrant in a workplace safety system?

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

Q.65 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. 8 hours
 - ☒ B. 7.5 hours
 - ☐ C. 10 hours
 - ☐ D. 6 hours

Q.66 What should come in place of the question mark (?) in the given series?

74, 83, 101, 128, ?, 209

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

Q.67 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 more on the Moon than on Earth
 - ☐ B. The object weighs the same on both the Moon and Earth
 - ☐ C. The object weighs zero on the Moon
 - ☒ D. The object weighs less on the Moon than on Earth

Q.68 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. 732
 - ☐ B. 729
 - ☒ C. 84
 - ☐ D. 78

Q.69 When using a hand file during fitting operations, which action demonstrates adherence to tool safety protocols?

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

Q.70 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. ₹5,000
 - ☐ B. ₹9,000
 - ☐ C. ₹8,000
 - ☒ D. ₹6,000

Q.71 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.72 Which line symbol is commonly used in engineering drawings to represent a hidden edge that is not directly visible?

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

Q.73 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. 27
 - ☐ B. 28
 - ☐ C. 29
 - ☐ D. 25

Q.74 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 the intersection of two lines and always has measurable length.
 - ☐ C. A point is a short line segment used to mark measurements.
 - ☐ D. A point represents a small area with both length and width.

Q.75 What is the main purpose of ambient air quality standards?

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

Q.76 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 years
 - ☐ D. 2.5 years

Q.77 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.78 Simplify: $60 - \{(-8) \times (-16 - 19 - 2)\} \div [5 \times \{2 + (-1) \times (-1)\}]$

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

Q.79 Which component makes up the largest proportion of Earth's atmosphere by volume?

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

Q.80 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. Father's sister
 - ☐ B. Father's mother
 - ☒ C. Mother's mother
 - ☐ D. Mother's sister

Q.81 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. 26.5% loss
 - ☐ B. 22.6% profit
 - ☐ C. 15.7% profit
 - ☐ D. 20.9% profit

Q.82 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. X
 - ☒ B. C
 - ☐ C. A
 - ☐ D. Z

Q.83 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 180 km per hour since that was the odometer reading at 8:00 am.
 - ☐ C. The car's average speed is 60 km per hour based only on the change in odometer readings.
 - ☐ D. The car's average speed is 240 km per hour since that was the odometer reading at 9:30 am.

Q.84 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. Mother's mother
 - ☒ B. Son's wife's mother
 - ☐ C. Son's wife's sister
 - ☐ D. Son's wife

Q.85 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 first quadrant
 - ☐ C. The object is placed in the fourth quadrant
 - ☐ D. The object is placed in the second quadrant

Q.86 Which is the most important safety check before operating any machine in a workshop?

- Ans
- ☐ A. Wipe the machine with a dry cloth before use
 - ☒ B. Inspect the machine for loose or damaged parts
 - ☐ C. Ensure the machine area is properly illuminated
 - ☐ D. Check if the machine is plugged in properly

Q.87 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. WSNYT
 - ☐ B. TSNWW
 - ☐ C. STMWV
 - ☒ D. WRNYT

Q.88 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. 82
 - ☐ B. 98
 - ☐ C. 99
 - ☐ D. 93

Q.89 Which of the following scenarios best demonstrates the conversion of chemical energy to mechanical energy?

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

Q.90 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. Only conclusion (II) follows
 - ☐ B. Both conclusions (I) and (II) follow
 - ☒ C. Only conclusion (I) follows
 - ☐ D. Neither conclusion (I) nor (II) follows

Q.91 What should come in place of the question mark (?) in the given series?

98, 104, 116, 134, 158, ?

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

Q.92 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. Use only standard orthographic projection without auxiliary views
 - ☐ B. Draw a simple circle at the junction in the top view
 - ☒ C. Draw the true shape of the intersection using auxiliary projection
 - ☐ D. Represent the intersection as a straight line in the side view

Q.93 What do touch gestures in Microsoft Windows allow users to do?

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

Q.94 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. 7.0 meters per second
 - ☐ C. 8.0 meters per second
 - ☒ D. 7.5 meters per second

Q.95 Which feature is a requirement of the BIS drawing standard in engineering drawings?

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

Q.96 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. 1
 - ☐ D. 2

Q.97 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.98 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. P
 - ☐ B. V
 - ☐ C. S
 - ☐ D. Q

Q.99 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. Three
 - ☐ C. Four
 - ☐ D. Two

Q.100 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 triangular prism will be clearly visible in the front view drawing
 - ☐ B. Only the rectangular base outline will be visible in the front view drawing
 - ☐ C. The outline of triangular prism and circular hole will be visible in front view only
 - ☒ D. The outline of rectangular base and triangular prism will be visible but hole is not shown

Section : PART-B

Q.1 What is a direct mechanical reason for low power generation in a diesel engine?

- Ans**
- ☐ A. Damaged fan belt
 - ☐ B. Faulty alternator
 - ☒ C. Worn piston rings
 - ☐ D. Incorrect coolant level

Q.2 Which component works directly with engine valves to manage air and exhaust flow in a diesel engine?

- Ans**
- ☐ A. The crankshaft
 - ☐ B. The fuel injector
 - ☐ C. The flywheel
 - ☒ D. The camshaft

Q.3 In the context of diesel engines, which of the following best describes the primary objective of emission standards?

- Ans**
- ☐ A. Increase smoke emission
 - ☐ B. Reduce engine power
 - ☐ C. Increase fuel wastage
 - ☒ D. Reduce pollution levels

Q.4 Which component is commonly used in evaporative emission control systems to store fuel vapors temporarily?

- Ans**
- ☐ A. Air filter case housing
 - ☒ B. Activated charcoal canister
 - ☐ C. Radiator expansion tank
 - ☐ D. Oil separator ball valve

Q.5 A technician observes that after a diesel engine runs for several hours, the vehicle's exhaust sound becomes much louder and a strong smell is detected at the tail pipe. What is the most probable function of the muffler being compromised in this situation?

- Ans**
- ☐ A. To convert exhaust gases and neutralize pollutants
 - ☐ B. To redirect exhaust gases and control flow only
 - ☒ C. To silence exhaust noise and cool gases before exit
 - ☐ D. To regulate exhaust back pressure for engine braking

Q.6 Which part of the Vernier caliper slides along the main scale for measurement?

- Ans**
- ☐ A. Lower jaw
 - ☐ B. Lock screw
 - ☐ C. Depth rod
 - ☒ D. Vernier scale

Q.7 During maintenance, a supervisor asks the role of a turbocharger when atmospheric pressure is low. How does it help the engine?

- Ans**
- ☐ A. It regulates the coolant flow to the engine
 - ☐ B. It supplies extra fuel to the engine
 - ☐ C. It lowers the engine noise produced
 - ☒ D. It supplies sufficient air to the engine

Q.8 In what way does contrast marking contribute to workshop safety?

- Ans**
- ☐ A. Increases oil spillage
 - ☐ B. Raises cutting speed
 - ☒ C. Minimizes chance of miscuts
 - ☐ D. Decreases lighting needs

Q.9 In an alternator stator, how are the windings typically connected in lightweight stator units?

- Ans**
- ☒ A. Star connected
 - ☐ B. Delta connected
 - ☐ C. Series connected
 - ☐ D. Parallel connected

Q.10 Which property makes particulates from diesel engines particularly harmful in urban environments?

- Ans**
- ☐ A. Particulates dissolve rapidly in water near cities
 - ☐ B. Particulates settle quickly on ground surfaces
 - ☐ C. Particulates neutralize when exposed to sunlight
 - ☒ D. Particulates remain suspended in air for long periods

Q.11 In which operation would a single-acting cylinder most likely provide the greatest efficiency?

- Ans**
- ☒ A. Opening and closing a heavy gate
 - ☒ B. Ejecting finished components from a machine
 - ☒ C. Regulating hydraulic fluid flow
 - ☒ D. Extending and retracting a tool holder

Q.12 An industrial diesel engine fitted with an automatic shutdown system begins to overheat. Which stopping method will the system typically initiate to ensure rapid and safe engine stoppage?

- Ans**
- ☒ A. Cutting the fuel supply via solenoid valve action
 - ☒ B. Disconnecting the starter motor circuit fully
 - ☒ C. Blocking the air intake using a shutoff flap
 - ☒ D. Engaging the decompression lever automatically

Q.13 Which tool is most appropriate for marking parts before removing them during diesel engine dismantling to ensure correct reassembly?

- Ans**
- ☒ A. A metal brush.
 - ☒ B. A barrette file.
 - ☒ C. An adjustable wrench.
 - ☒ D. A center punch.

Q.14 Where is the timing belt or timing chain generally located in a typical engine layout?

- Ans**
- ☒ A. Front section of the engine
 - ☒ B. Middle section of the engine
 - ☒ C. Top section of the engine
 - ☒ D. Bottom section of the engine

Q.15 Which practice helps maintain the accuracy of a steel rule during daily use?

- Ans**
- ☒ A. Measure hot metal parts
 - ☒ B. Wash after every use
 - ☒ C. Oil every hour of use
 - ☒ D. Avoid dropping on floor

Q.16 A customer complains about sluggish acceleration at low speeds in a diesel vehicle with a fixed-geometry turbocharger. How does a variable geometry turbocharger address this issue?

- Ans**
- ☒ A. By altering turbine geometry to create boost at low speed
 - ☒ B. By reducing exhaust manifold pressure at idle
 - ☒ C. By raising exhaust gas temperature automatically
 - ☒ D. By increasing fuel supply at low engine speeds

Q.17 A mechanic inspects a diesel engine and finds the oil level indicator shows the oil is just at the 'Low' mark after running the engine for several hours. What is the most appropriate professional action to ensure engine protection?

- Ans**
- ☒ A. Add oil until the stick is overfilled beyond Full mark
 - ☒ B. Check the oil again without adding oil to confirm reading
 - ☒ C. Continue running the engine until next scheduled maintenance
 - ☒ D. Add oil until the level reaches the Full mark as indicated

Q.18 In a battery, the electrolyte conducts electricity through movement of:

- Ans**
- ☐ A. Neutral atoms only
 - ☐ B. Magnetic domains
 - ☐ C. Free electrons only
 - ☒ D. Ions

Q.19 Which factor is most important when selecting the material for main bearings in diesel engines?

- Ans**
- ☐ A. Good machinability
 - ☐ B. Low manufacturing cost
 - ☒ C. Ability to withstand cyclic loads
 - ☐ D. High thermal conductivity

Q.20 If a flat chisel is used instead of a center punch before drilling, what problem might occur?

- Ans**
- ☐ A. Drill will make a larger hole
 - ☒ B. Drill bit may slip off the spot
 - ☐ C. Drill will cut faster
 - ☐ D. Workpiece will become softer

Q.21 Which of the following has both magnitude and direction, making it a vector quantity?

- Ans**
- ☐ A. Distance
 - ☐ B. Speed
 - ☒ C. Velocity
 - ☐ D. Time

Q.22 In a training scenario, a student is asked about the correct sequence in a forced feed system. Which order best reflects the movement of fuel from the tank to the combustion chamber?

- Ans**
- ☒ A. Fuel passes from tank to water separator, through filters, to injection pump, then injectors
 - ☐ B. Fuel bypasses filters, moves directly from tank to injectors, then to combustion chamber
 - ☐ C. Fuel moves from injection pump to filters, then to tank, finally to injectors
 - ☐ D. Fuel travels from injectors to water separator, then to tank, finally to combustion chamber

Q.23 Which bearing applications in diesel engines make use of bronze materials?

- Ans**
- ☐ A. Camshaft bearings
 - ☒ B. Bushings
 - ☐ C. Connecting rod bearings
 - ☐ D. Main bearings

Q.24 Which engine part must work closely with the connecting rod to produce rotational movement?

- Ans**
- ☐ A. Fuel injector
 - ☐ B. Oil filter
 - ☒ C. Crankshaft
 - ☐ D. Cylinder head

Q.25 The voltage regulator controls alternator voltage by varying the current flow to the:

- Ans**
- ☐ A. Stator
 - ☐ B. Battery
 - ☐ C. Ammeter
 - ☒ D. Rotor

Q.26 Which components are connected to each end of the alternator rotor's field winding?

Ans ☒ A. Slip rings
☐ B. Iron poles
☐ C. Diodes
☐ D. Bearings

Q.27 Which type of line is typically used to represent centre lines in engineering drawings?

Ans ☐ A. Continuous thin line
☒ B. Chain thin line
☐ C. Chain thick
☐ D. Dashed thin line

Q.28 When selecting a drill bit for making precise holes in a hard metal workpiece, which feature should be prioritized to ensure accuracy and tool life?

Ans ☒ A. Drill bits need appropriate point angles and must be HSS or carbide.
☐ B. The drill bit should be made up of carbon steel and have a flat tip.
☐ C. The drill bit should have a long flute length and no coating at all.
☐ D. The drill bit must have a decorative coating and short overall length.

Q.29 What is the main function of a direction control valve in a hydraulic system?

Ans ☐ A. To filter contaminants from fluid
☐ B. To adjust fluid temperature
☐ C. To regulate system pressure
☒ D. To control the path of fluid flow

Q.30 In a gravity feed system, what action causes fuel to start moving from the tank to the engine?

Ans ☒ A. Releasing the fuel cock allows fuel to flow downward
☐ B. Activating the pump starts the fuel flow upward
☐ C. Heating the fuel tank initiates fuel movement
☐ D. Pressurizing the fuel line pushes fuel forward

Q.31 A commercial vehicle manufacturer plans to design a new city bus for frequent stop-and-go urban traffic. Which engine layout would most effectively facilitate easy passenger boarding, maximize internal space, and support rear-driven axles for better traction, given the operational requirements?

Ans ☒ A. Selecting a rear transverse engine layout for the bus design
☐ B. Selecting a rear longitudinal engine layout for the bus design
☐ C. Selecting a front longitudinal engine layout for the bus design
☐ D. Selecting a front transverse engine layout for the bus design

Q.32 An automotive technician needs to ensure the camshaft is not bent during installation. How can a dial indicator assist in this process?

Ans ☐ A. By measuring the camshaft lobe base circle diameter at a completely fixed position
☒ B. By measuring the camshaft's straightness as it is rotated and noting any deviation
☐ C. By ensuring the camshaft journals are properly lubricated prior to the installation
☐ D. By verifying the camshaft achieves the specified torque value after final tightening

Q.33 If a vehicle has two axles and each axle supports two wheels, what technical category does it fall under?

- Ans**
- ☐ A. It is grouped as a six-wheeler vehicle type
 - ☐ B. It is categorized as a two-wheeler vehicle type
 - ☒ C. It is classified as a four-wheeler vehicle type
 - ☐ D. It is known as a three-wheeler vehicle type

Q.34 A key advantage of using a lubricating compound in thread sealing is that it:

- Ans**
- ☐ A. Acts as a solvent for contaminants present
 - ☒ B. Prevents galling and seizing of threads
 - ☐ C. Improves thread strength significantly
 - ☐ D. Accelerates the curing of sealant used

Q.35 A diesel mechanic compares engine types and finds one where each cylinder contains two pistons attached to separate connecting rods. What operational benefit is most associated with this engine type?

- Ans**
- ☐ A. Reducing overall fuel consumption is most associated with this engine type.
 - ☐ B. Simplifying engine maintenance tasks is most associated with this engine type.
 - ☒ C. Achieving a higher power to weight ratio is most associated with this engine type.
 - ☐ D. Improving engine cooling efficiency is most associated with this engine type.

Q.36 Which of the following is a common cause of knocking noise in a diesel engine?

- Ans**
- ☐ A. Loose cylinder head bolts
 - ☐ B. Excessive engine oil
 - ☐ C. Worn out piston rings
 - ☒ D. Incorrect fuel injection timing

Q.37 In a parallel connection, all branches connected across the same two nodes have :

- Ans**
- ☒ A. Equal voltage
 - ☐ B. Equal power dissipation
 - ☐ C. Different currents only
 - ☐ D. Zero resistance

Q.38 Which sensor helps quiet diesel technology operate effectively?

- Ans**
- ☒ A. Crankshaft position sensor
 - ☐ B. Fuel filter clog sensor
 - ☐ C. Air intake pressure sensor
 - ☐ D. Engine oil temperature sensor

Q.39 In which application is an external gear pump commonly used in the field of hydraulics?

- Ans**
- ☐ A. Lubricating bearings in engines
 - ☒ B. Supplying oil to hydraulic systems
 - ☐ C. Compressing fuel in injectors
 - ☐ D. Transferring air in pneumatic systems

Q.40 During a batch production task, the operator must switch quickly between different sizes of workpieces. Which drill vice feature will improve efficiency without compromising holding security?

- Ans**
- ☒ A. Quick-release mechanism with adjustable jaw inserts
 - ☐ B. Elastic bands added to standard vice jaws being used
 - ☐ C. Fixed jaws with no jaw adjustment capability
 - ☐ D. Manual unscrewing of vice jaws for each workpiece change

Q.41 In engineering drawing, what is another name for a pictorial/isometric drawing?

- Ans**
- ☒ A. Three-dimensional drawing
 - ☐ B. Sectional drawing
 - ☐ C. Orthographic drawing
 - ☐ D. Dimension drawing

Q.42 A diesel engine manufacturer needs to ensure rapid and consistent coolant flow through the engine regardless of its operating temperature. Which cooling system design should be selected to meet this requirement?

- Ans**
- ☐ A. Thermosyphon system provides rapid and consistent coolant flow
 - ☐ B. Air cooling system provides rapid and consistent coolant flow
 - ☒ C. Pump circulation system provides rapid and consistent coolant flow
 - ☐ D. Water cooling system provides rapid and consistent coolant flow

Q.43 In a real-life scenario, how should a mechanic systematically diagnose and remedy persistent high engine oil pressure involving multiple possible causes?

- Ans**
- ☐ A. Clean exhaust manifold, replace air filter, and tighten cylinder head bolts
 - ☐ B. Replace coolant, inspect radiator, and adjust idle speed
 - ☐ C. Adjust fuel mixture, check battery terminals, and clean spark plugs
 - ☒ D. Check oil viscosity, inspect relief valve, clean oil filter, and verify oil pump operation

Q.44 Which of the following actions is the safest procedure if fuel is accidentally spilled in a workshop environment?

- Ans**
- ☐ A. Ignore the spilled fuel completely and allow yourself to continue working as normal.
 - ☐ B. Apply water directly to the spill area so that the fuel is immediately diluted.
 - ☐ C. Leave the spill completely unattended and deal with it only at the end of the shift.
 - ☒ D. Clean the spill using approved absorbents and dispose of it as per guidelines

Q.45 In a transformer, if primary conditions remain constant, increasing the number of turns in the secondary winding causes the secondary voltage to:

- Ans**
- ☐ A. Decrease
 - ☐ B. Remain unchanged
 - ☐ C. Become zero
 - ☒ D. Increase

Q.46 Which mechanism acts as a lever to open the engine valve when pushed by the push rod in a diesel engine?

- Ans**
- ☐ A. Camshaft mechanism
 - ☐ B. Tappet mechanism
 - ☒ C. Rocker arm mechanism
 - ☐ D. Push rod mechanism

Q.47 Which type of valves is most commonly used in diesel engine cylinder heads?

- Ans**
- ☐ A. Sleeve valve
 - ☐ B. Needle valve
 - ☐ C. Rotary valve
 - ☒ D. Poppet valve

Q.48 What should be done if a toxic dust container is full in the workshop?

- Ans**
- ☐ A. Continue using the same container
 - ☐ B. Leave the container open until convenient
 - ☐ C. Mix dust in the container with general waste
 - ☒ D. Seal and replace the container immediately

Q.49 Which of the following best defines machine efficiency?

- Ans**
- ✓ A. Ratio of output to input
 - ✗ B. Ratio of input to output
 - ✗ C. Difference between input and output
 - ✗ D. Product of input and output

Q.50 Why are compression ignition engines NOT preferred for high-speed applications?

- Ans**
- ✗ A. Requires a complex ignition system
 - ✗ B. Smooth operation which decreases speed
 - ✓ C. Heavier components reduce maximum speed
 - ✗ D. Produces no torque at high speeds

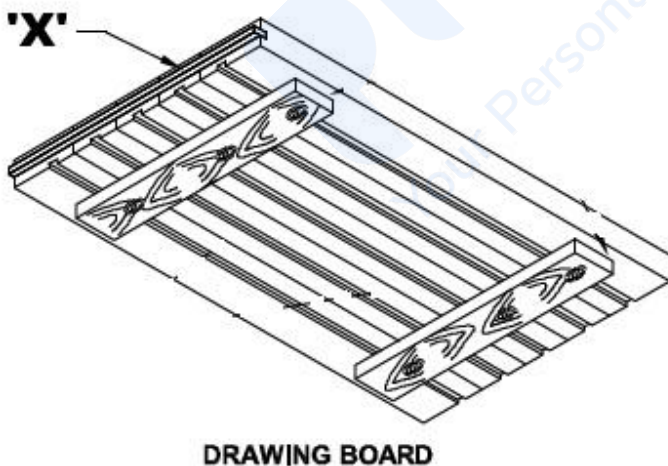
Q.51 In a single overhead camshaft diesel engine, how many camshafts are used for both intake and exhaust valves?

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

Q.52 An engine test reveals that the feed pump supplies inconsistent amounts of fuel to the filters under varying engine speeds. What is the most likely explanation for this behavior, considering the feed pump's design and function?

- Ans**
- ✓ A. The camshaft-driven feed pump varies delivery with engine speed changes.
 - ✗ B. A clogged fuel filter causes fluctuating pressure in the system.
 - ✗ C. Air entering the fuel tank causes irregular fuel supply patterns.
 - ✗ D. The injector opening pressure changes with engine temperature.

Q.53 What is the name of the part of the shorter edges of the drawing board shown in the figure that is marked with 'X'?



- Ans**
- ✗ A. Battens
 - ✓ B. Ebony edge
 - ✗ C. Wooden Strips
 - ✗ D. Drawing pin

Q.54 If the battery is too weak to operate the starter motor, which starting method can be used in a suitable manual-transmission vehicle?

- Ans**
- ✓ A. Starting the vehicle by push-starting.
 - ✗ B. Starting the vehicle by ignition switch.
 - ✗ C. Starting the vehicle by remote switch.
 - ✗ D. Starting the vehicle by starter motor.

Q.55 In Third Angle Projection, onto which plane is the elevation of an object projected?

- Ans**
- ☐ A. Auxiliary plane
 - ☐ B. Inclined plane
 - ☒ C. Vertical plane
 - ☐ D. Horizontal plane

Q.56 Which of the following statements correctly matches the units of mass with their respective systems?

- Ans**
- ☐ A. F.P.S system uses gram, C.G.S system uses kilogram, M.K.S system uses pound
 - ☐ B. F.P.S system uses gram, C.G.S system uses pound, M.K.S system uses kilogram
 - ☐ C. F.P.S system uses kilogram, C.G.S system uses pound, M.K.S system uses gram
 - ☒ D. F.P.S system uses pound, C.G.S system uses gram, M.K.S system uses kilogram

Q.57 Which emission standard is currently enforced for diesel vehicles to limit harmful exhaust gases in India?

- Ans**
- ☐ A. Bharat Stage III
 - ☐ B. Bharat Stage IV
 - ☐ C. Bharat Stage VII
 - ☒ D. Bharat Stage VI

Q.58 What property is primarily strengthened in alloy steels through carburizing for piston pins?

- Ans**
- ☒ A. Surface hardness
 - ☐ B. Ductility
 - ☐ C. Thermal conductivity
 - ☐ D. Corrosion resistance

Q.59 When proper safety procedures are followed, compressed air may be used for many workshop tasks. Which of the following should never be done with compressed air?

- Ans**
- ☒ A. Remove dust from clothes
 - ☐ B. Operate pneumatic tools
 - ☐ C. Clean machine surfaces
 - ☐ D. Inflate vehicle tyres

Q.60 Compression ignition engines are known for their ability to operate efficiently at which type of compression ratio?

- Ans**
- ☐ A. Medium compression ratio
 - ☐ B. Variable compression ratio
 - ☐ C. Low compression ratio
 - ☒ D. High compression ratio

Q.61 Which issue complicates the implementation of quiet diesel engines?

- Ans**
- ☐ A. Operating at lower injection pressure
 - ☐ B. Using simpler fuel lines
 - ☒ C. Precise control of injection timing
 - ☐ D. Designing larger injectors

Q.62 Why is it important for a temperature-resistant thread sealant to resist both thermal cycling and vibration in automotive environments?

- Ans**
- ☒ A. To prevent real-world leaks and seal degradation
 - ☐ B. To ensure rapid curing under cold start conditions
 - ☐ C. To withstand continuous high heat without vibration
 - ☐ D. To facilitate easy removal of components after use

Q.63 Which component typically initiates the oil splash in a splash lubrication system?

- Ans**
- ☐ A. The vibrating cylinder head
 - ☐ B. The intake valve
 - ☒ C. The rotating crankshaft
 - ☐ D. The vibrating crankcase

Q.64 What happens to the armature and rotor in an electromagnetic coupling when the voltage is removed?

- Ans**
- ☒ A. The pre stressed spring separates them
 - ☐ B. Torque remains applied
 - ☐ C. The armature stays connected
 - ☐ D. The magnetic force holds them together

Q.65 Which electrical component fault can completely interrupt power supply to the ignition and starter circuits, causing engine not starting?

- Ans**
- ☒ A. Main fuse blown off
 - ☐ B. Defective brushes in starter
 - ☐ C. Air lock in fuel system
 - ☐ D. Defective starting relay

Q.66 A diesel mechanic observes that certain engine parts show signs of rust after a long period without maintenance. Which function of lubricating oil is most relevant in preventing this scenario, considering its role in corrosion reduction?

- Ans**
- ☐ A. Neutralizing acids produced during combustion
 - ☐ B. Facilitating heat transfer within engine parts
 - ☐ C. Reducing mechanical friction among moving parts
 - ☒ D. Forming a protective barrier over metal surfaces

Q.67 A marine diesel engine is fitted with a coolant system operating under increased pressure. During operation, the engine coolant temperature rises above normal limits. What is the most likely direct consequence regarding the coolant's boiling point due to the increased system pressure?

- Ans**
- ☐ A. The boiling point of the coolant remains unchanged at all pressures.
 - ☐ B. The coolant will boil at a lower temperature under higher pressure.
 - ☐ C. The boiling point of the coolant decreases with system pressure.
 - ☒ D. The boiling point of the coolant increases with system pressure.

Q.68 Which combination of materials is commonly used for the construction of a cross-cut chisel's body and edge?

- Ans**
- ☐ A. Body and edge both mild steel
 - ☐ B. Body and edge both brass
 - ☒ C. Body of mild steel, edge of hardened steel
 - ☐ D. Body of hardened steel, edge of mild steel

Q.69 Which process is initiated when the cooling fan operates as designed in a diesel engine cooling system?

- Ans**
- ☒ A. Air is drawn through radiator fins, cooling engine coolant
 - ☐ B. Electric current is increased by the alternator circuit
 - ☐ C. Air is filtered before entering the combustion chamber
 - ☐ D. Fuel is circulated faster through the injector pump

Q.70 A diesel engine workshop tests a radiator by measuring the temperature of water entering and exiting the radiator core during a simulated run. What finding would best confirm that the radiator is performing its intended function?

- Ans**
- ☒ A. The water entering is significantly hotter than the water exiting
 - ☐ B. The water temperature changes slightly with no significant difference
 - ☐ C. The water exiting is significantly hotter than the water entering
 - ☐ D. The water entering is the same temperature as the water exiting

Q.71 A solar cell operates on the principle of the:

- Ans**
- ☐ A. Electrochemical effect
 - ☐ B. Heating effect
 - ☐ C. Piezoelectric effect
 - ☒ D. Photovoltaic effect

Q.72 Excessive oil consumption in a diesel engine, accompanied by thick blue smoke emitting from the exhaust, most likely indicates:

- Ans**
- ☐ A. Worn out gudgeon pins
 - ☐ B. High oil level in the sump
 - ☐ C. Low coolant level
 - ☒ D. Piston rings worn out

Q.73 Which statement describes the main function of a die stock in the context of threading tools?

- Ans**
- ☐ A. It sharpens the cutting edges of dies
 - ☐ B. It measures the diameter of threads during threading operations
 - ☐ C. It cleans debris from newly cut threads
 - ☒ D. It securely holds the die to cut external threads on rods or pipes

Q.74 What is the main function of the adjustment feature on a micrometer?

- Ans**
- ☐ A. To increase the measurement range
 - ☐ B. To lock the spindle for repeated readings
 - ☒ C. To set the zero reading for accuracy
 - ☐ D. To change the scale type used

Q.75 Which type of bearings is most commonly used for supporting the crankshaft in a diesel engine?

- Ans**
- ☐ A. Needle bearing
 - ☐ B. Roller bearing
 - ☐ C. Ball bearing
 - ☒ D. Plain bearing