



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 Millwright Mechanic Machine Tool Maintenance

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

Q.2 Find the LCM of 72, 78, and 90.

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

Q.3 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. R
- ☒ B. P
- ☒ C. Q
- ☒ D. S

Q.4 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. Define the top event representing the injury
- ☒ B. List all possible causes of failures
- ☒ C. Validate the analysis using workplace data
- ☒ D. Establish preventive measures to control risks

Q.5 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.6 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 distance divided by total time, and its unit is meter per second.
 - ☒ C. Average velocity is the total displacement divided by total time, and its unit is meter per second.
 - ☐ D. Average velocity is the total displacement divided by total time, and its unit is kilometer per hour.

Q.7 What is an email used for?

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

Q.8 Which of the following best describes a key environmental concern associated with improper disposal of e-waste?

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

Q.9 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 are NOT sufficient to answer the question.
 - ☐ B. Data in statement II alone is sufficient to answer the question while data in statement I is not
 - ☐ C. Both statements I and II together (and not statement I alone or statement II alone) are sufficient to answer the question
 - ☐ D. Data in statement I alone is sufficient to answer the question while data in statement II is not

Q.10 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. 45.8 km/h
 - ☐ C. 46.5 km/h
 - ☐ D. 45.3 km/h

Q.11 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 inertia
 - ☐ B. Principle of superposition
 - ☒ C. Law of conservation of energy
 - ☐ D. Principle of inertia

Q.12 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 sister
 - ☐ B. Father's mother
 - ☐ C. Father's sister
 - ☒ D. Mother's mother

Q.13 Which component makes up the largest proportion of Earth's atmosphere by volume?

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

Q.14 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. Two
 - ☐ D. Three

Q.15 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 B 35 D 7 A 9 C 2 = ?

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

Q.16 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. JHZ 24
 - ☐ B. HIZ 30
 - ☐ C. IHS 23
 - ☒ D. IGA 25

Q.17 A shopkeeper marks a product 75% above cost price and offers two successive discounts of 30% and 40%. What is the profit or loss percentage?

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

Q.18 Which integrated strategy best addresses soil pollution, falling crop yields, and low microbial activity near an industrial zone?

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

Q.19 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. ₹1,440
 - ☐ C. ₹1,200
 - ☐ D. ₹1,380

Q.20 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. $\sqrt{97}$ cm
 - ☒ D. $\sqrt{119}$ cm

Q.21 If 'A' stands for '÷', 'B' stands for '×', 'C' stands for '+' and 'D' stands for '−', what will come in place of the question mark '?' in the following equation?

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

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

Q.22 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. 20 km/h east
 - ☐ C. 30 km/h east
 - ☐ D. 40 km/h east

Q.23 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. HJVI
 - ☐ D. IKUH

Q.24 A boat sails 40 km downstream and then 40 km upstream in a river. The boat's speed in still water is 12 km/hr and the speed of the stream is 4 km/hr. How much time does the boat take to cover the entire distance (both upstream and downstream)?

- Ans**
- ☐ A. 10 hours
 - ☒ B. 7.5 hours
 - ☐ C. 8 hours
 - ☐ D. 6 hours

Q.25 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. VCD : GRD
 - ☒ B. FMT : IQY
 - ☒ C. CGW : NHT
 - ☒ D. XDE : PON

Q.26 Which line symbol is commonly used in engineering drawings to represent a hidden edge that is not directly visible?

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

Q.27 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. 8.0 meters per second
 - ☒ B. 7.0 meters per second
 - ☒ C. 6.5 meters per second
 - ☒ D. 7.5 meters per second

Q.28 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. Project all visible elements from the side and omit hidden features unless needed
 - ☒ B. Include all features even those not visible from the selected side view
 - ☒ C. Sketch the side view freely without using projections from the main view
 - ☒ D. Use only hidden lines for representing features on the far side in the view

Q.29 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. 1
 - ☒ B. 0
 - ☒ C. $\sin A - \cos A$
 - ☒ D. $\cos A + \sin A$

Q.30 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. ₹72,604
 - ☒ C. ₹74,624
 - ☒ D. ₹73,624

Q.31 In this question, a question is followed by two statements numbered (I) and (II). You have to decide whether the data provided in the statements are sufficient to answer the question. Read both the statements and decide the appropriate answer.
Among the five poles—I, N, C, H, and L—each having a different height, which pole is the tallest?
(I) I is shorter than N but taller than C. C is taller than only one pole.
(II) H is taller than L.

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

Q.32 Which property of a fuse wire ensures it melts quickly when excess current flows?

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

Q.33 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.34 If 'A' stands for '+', 'B' stands for '−', 'C' stands for '×' and 'D' stands for '÷', then what will come in place of the question mark (?) in the following equation?

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

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

Q.35 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. 3.5 meter per second
 - ☒ C. 4.5 meter per second
 - ☒ D. 4 meter per second

Q.36 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. 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 in a LAN provides low-speed data transfer and connects users over public Internet infrastructure.

Q.37 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.38 An engineer is tasked with creating the front view of a mechanical part. The part has a rectangular base with a vertical circular hole passing through it and a triangular prism attached on top. Which of the following best describes what will be visible in the front view?

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

Q.39 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. P
 - ☐ C. Q
 - ☐ D. S

Q.40 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.41 Three pipes A, B and C can fill a tank in 12 hours, 18 hours and 24 hours, respectively. A leak at the bottom can empty the full tank in 36 hours. If all the pipes are opened together, in how many hours will the tank be filled? (Round off your answer to two decimal places.)

- Ans**
- ☐ A. 9.45 hours
 - ☐ B. 5.56 hours
 - ☒ C. 6.55 hours
 - ☐ D. 3.33 hours

Q.42 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
 - ☒ C. 43
 - ☐ D. 42.5

Q.43 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 (I) follows
 - ☐ B. Neither conclusion (I) nor (II) follows
 - ☐ C. Both conclusions (I) and (II) follow
 - ☐ D. Only conclusion (II) follows

Q.44 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. 84
 - ☐ C. 732
 - ☐ D. 729

Q.45 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. Two
 - ☐ C. One
 - ☒ D. Three

Q.46 Which of the following scenarios best demonstrates the conversion of chemical energy to mechanical energy?

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

Q.47 A conical tent has a base radius of 14 m and a height of 48 m. How many cubic meters of air can it hold? (Use $\pi = \frac{22}{7}$)

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

Q.48 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 second quadrant
 - ☐ D. The object is placed in the fourth quadrant

Q.49 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. 99
 - ☐ B. 93
 - ☐ C. 98
 - ☒ D. 82

Q.50 Which situation best describes an entanglement hazard in a mechanical workshop?

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

Q.51 What do touch gestures in Microsoft Windows allow users to do?

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

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

Q.53 When a moving car suddenly applies brakes, its kinetic energy is transformed mainly into which form of energy?

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

Q.54 If $\left(x + \frac{1}{x}\right) = 3$, find the value of $\left(x^3 + \frac{1}{x^3}\right)$.

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

Q.55 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. BG – EJ
 - ☒ B. DJ – GM
 - ☒ C. AF – DI
 - ☒ D. CH – EK

Q.56 Which approach most effectively reduces both nitrogen and phosphorus concentrations during wastewater treatment?

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

Q.57 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. 4 m
 - ☒ B. 0.4 m
 - ☒ C. 4000 mm
 - ☒ D. 400 cm

Q.58 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. ₹11,000
 - ☒ B. ₹12,000
 - ☒ C. ₹9,000
 - ☒ D. ₹10,000

Q.59 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.60 A thermometer shows a reading of 37 degrees Celsius. What is the corresponding temperature in Kelvin?

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

Q.61 Which of the following is both, an input and output device?

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

Q.62 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.63 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 mother
 - ☐ B. Mother's mother
 - ☐ C. Son's wife's sister
 - ☐ D. Son's wife

Q.64 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. 0 km/h
 - ☐ C. 20 km/h south
 - ☐ D. 33.3 km/h north

Q.65 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 focus exclusively on industrial operations while ignoring other sectors.
 - ☐ C. To require all industries to reduce emissions by the exact same percentage.
 - ☐ D. To ensure air is routinely sampled to map historical pollution trends.

Q.66 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. 25
 - ☐ D. 20.5

Q.67 Based on the English alphabetical order, three of the following four letter-cluster pairs are alike in a certain way and thus form a group. Which letter-cluster pair DOES NOT belong to that group?

(Note: The odd one out is not based on the number of consonants/vowels or their position in the letter-cluster.)

- Ans**
- ☐ A. TN-ZD
 - ☐ B. EY-KO
 - ☒ C. QK-VA
 - ☐ D. WQ-CG

Q.68 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. Draw a simple circle at the junction in the top view
 - ☐ B. Use only standard orthographic projection without auxiliary views
 - ☒ C. Draw the true shape of the intersection using auxiliary projection
 - ☐ D. Represent the intersection as a straight line in the side view

Q.69 What is the best description of the purpose of multi-view drawing in engineering drawing?

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

Q.70 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.71 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. 500 J
 - ☐ B. 1000 J
 - ☐ C. 0 J
 - ☐ D. 50 J

Q.72 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 15 K.
 - ☒ C. The temperature change is 20 K.
 - ☐ D. The temperature change is 50 K.

Q.73 Simplify: $60 - \{(-8) \times (-16 - 19 - 2)\} \div [5 \times \{2 + (-1) \times (-1)\}]$

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

Q.74 What should come in place of the question mark (?) in the given series?

98, 104, 116, 134, 158, ?

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

Q.75 What is the primary function of a fire hydrant in a workplace safety system?

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

Q.76 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.77 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. Matching only the overall height of the cone
 - ☒ C. Focusing only on base diameter for precise fit
 - ☒ D. Ensuring the slant height matches the assembly requirement

Q.78 If a scooter travels at a constant speed of 25 km per hour, how far will it travel in 4 hours?

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

Q.79 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.80 Solve the system of equations:

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

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

Q.81 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 remains at 2.5 seconds
 - ☒ C. It has decreased to 1.5 seconds
 - ☒ D. It has decreased to 2.0 seconds

Q.82 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-East
 - ☐ B. North-East
 - ☐ C. South-West
 - ☒ D. North-West

Q.83 When using a hand file during fitting operations, which action demonstrates adherence to tool safety protocols?

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

Q.84 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. S
 - ☐ D. R

Q.85 What is the typical temperature range covered by a laboratory thermometer used in school experiments?

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

Q.86 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 zero on the Moon
 - ☒ B. The object weighs less on the Moon than on Earth
 - ☐ C. The object weighs more on the Moon than on Earth
 - ☐ D. The object weighs the same on both the Moon and Earth

Q.87 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 deleted from the original worksheet.
 - ☒ 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 saved to a new file.

Q.88 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.89 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. 12.6%
 - ☒ B. 13.0%
 - ☒ C. 13.7%
 - ☒ D. 14.1%

Q.90 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 becoming entangled in a rotating machine shaft during operation
 - ☒ B. A hand touching a hot metallic machine surface during maintenance activity
 - ☒ C. A hand caught between a moving blade and a fixed machine surface during operation
 - ☒ D. A hand sliding repeatedly across a rough abrasive machine surface during work

Q.91 Refer to the following letter series and answer the question that follows. Counting to be done from left to right only.

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

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

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

Q.92 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.93 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. One
 - ☒ B. Three
 - ☒ C. Four
 - ☒ D. Two

Q.94 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.95 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. 42
 - ☐ B. 27
 - ☒ C. 39
 - ☐ D. 53

Q.96 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.97 Which feature is a requirement of the BIS drawing standard in engineering drawings?

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

Q.98 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. 45 kg
 - ☒ B. 50 kg
 - ☐ C. 48 kg
 - ☐ D. 52 kg

Q.99 Which statement best describes a 'point' in engineering drawing?

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

Q.100 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. 92450
 - ☐ B. 92500
 - ☒ C. 92400
 - ☐ D. 92550

Section : PART-B

Q.1 What needs to be checked when a threaded pipe connection becomes loose after cutting?

- Ans
- ☐ A. Type of tap used
 - ☒ B. Die adjustment setting
 - ☐ C. Cutting speed applied
 - ☐ D. Amount of lubricant used

Q.2 Which type of operation is most commonly performed on a vertical milling machine?

- Ans
- ☒ A. Face milling of flat surfaces
 - ☐ B. Slot milling with side cutters
 - ☐ C. Angular milling with swivelling head
 - ☐ D. End milling of narrow profiles

Q.3 Which specification parameter is most critical for ensuring a flat belt fits properly on pulleys in a power transmission system?

- Ans
- ☐ A. The material of the belt
 - ☐ B. The thickness of the belt
 - ☐ C. The pitch length of the belt
 - ☒ D. The width of the belt

Q.4 In a mechanical workshop, what is the main purpose of wearing safety goggles while operating grinding machines?

- Ans
- ☐ A. To prevent hearing loss from loud equipment
 - ☐ B. To reduce inhalation of dust particles
 - ☒ C. To protect the eyes from flying debris and sparks
 - ☐ D. To avoid electric shock from faulty wiring

Q.5 A maintenance engineer observes that the input and output shafts in a gearbox are neither parallel nor intersecting and there is a need for smooth, quiet operation under high loads. Which gear arrangement is most suitable in this context?

- Ans
- ☒ A. Hypoid gear
 - ☐ B. Spiral bevel gear
 - ☐ C. Helical gear
 - ☐ D. Worm gear

Q.6 Which cutting tool material is most appropriate for high-speed CNC machining of hard metals?

- Ans
- ☐ A. Cast iron
 - ☒ B. Cemented carbide
 - ☐ C. High-speed steel
 - ☐ D. Tool steel

Q.7 In the British Standard system, how is the tolerance zone typically represented in diagrams?

- Ans**
- ☐ A. As a horizontal line representing measured dimension of component
 - ☒ B. As a region located relative to the zero line representing basic size
 - ☐ C. As an average value obtained from repeated dimensional readings
 - ☐ D. As a numerical value representing the machining allowance

Q.8 A lathe machine is being installed in a new workshop. Which of the following must be checked first to ensure proper installation according to standard maintenance practices?

- Ans**
- ☐ A. Filling with recommended lubricant
 - ☒ B. Foundation level and alignment
 - ☐ C. Checking electrical wiring
 - ☐ D. Trial running and observation

Q.9 In a fabrication sketch, which line correctly indicates the edge of a mounting bracket that is visible from the front view?

- Ans**
- ☒ A. Object line
 - ☐ B. Dimension line
 - ☐ C. Hidden line
 - ☐ D. Center line

Q.10 Which symbol is used to indicate a pressure source in pneumatic drawings?

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

Q.11 Where should the measuring probe be placed to obtain reliable vibration readings for bearing condition monitoring?

- Ans**
- ☐ A. On the machine foundation away from all rotating mechanical components
 - ☐ B. Directly on the rotating shaft during normal machine operating conditions
 - ☐ C. Loosely against the protective guard covering the rotating machine assembly
 - ☒ D. Firmly on the bearing housing near the monitored bearing location

Q.12 A maintenance team noticed an increase in machine breakdowns and wants to reduce unplanned stoppages. Which of the following actions supports total productive maintenance principles?

- Ans**
- ☐ A. Reducing operator involvement in upkeep
 - ☐ B. Assigning repairs only after breakdown
 - ☒ C. Scheduling routine checks for all machines
 - ☐ D. Allowing machines to run until failure

Q.13 Which component in a PLC architecture is primarily responsible for executing control instructions and managing logic operations?

- Ans**
- ☐ A. Output Module
 - ☒ B. Central Processing Unit (CPU)
 - ☐ C. Input Module
 - ☐ D. Power Supply

Q.14 What safety feature is designed to shield the operator from fragments in case a grinding wheel breaks on a pedestal grinder?

- Ans**
- ☒ A. Wheel guard
 - ☐ B. Base
 - ☐ C. Tool rest
 - ☐ D. Motor cover

Q.15 During routine inspection, an engineer notices a grooved nut applied on a shaft with a missing set screw. What is the most likely risk associated with this condition?

- Ans**
- ☐ A. The threads will experience reduced wear
 - ☐ B. The nut may seize onto the shaft
 - ☒ C. The nut may loosen due to vibration or movement
 - ☐ D. The nut will transmit more torque to the shaft

Q.16 Why is the root of a screw thread often rounded in high-stress applications?

- Ans**
- ☐ A. To improve thread fit
 - ☒ B. To reduce stress concentration
 - ☐ C. To increase holding power
 - ☐ D. To reduce friction

Q.17 A maintenance team finds that predictive maintenance alerts from a cloud-based dashboard are delayed by several hours. All smart sensors and PLCs on the production line show normal operation with no device errors. Which connectivity issue is most likely causing this delay?

- Ans**
- ☐ A. Outdated firmware on smart sensors causing local data loss
 - ☐ B. Incorrect PLC address configuration in local controllers
 - ☐ C. Sensor power supply fluctuations affecting sensor readings
 - ☒ D. Unstable internet connection between factory network and cloud

Q.18 Which tool is commonly used for lifting heavy stone blocks during foundation erection in mechanical engineering works?

- Ans**
- ☐ A. Wedge bolt
 - ☐ B. Expansion bolt
 - ☐ C. Eye bolt
 - ☒ D. Lewis bolt

Q.19 What key synchronization challenge arises in systems using multiple 5 by 2 valves for controlling different actuators?

- Ans**
- ☐ A. Avoiding mixing of supply and exhaust air
 - ☒ B. Ensuring all valves operate in correct sequence
 - ☐ C. Matching all valve cycle times for safety
 - ☐ D. Preventing excessive pressure drop across all valves

Q.20 Which modification would reduce the force output of a pneumatic actuator without altering supply pressure or stroke length?

- Ans**
- ☐ A. Change mounting style
 - ☐ B. Shorten the stroke length
 - ☒ C. Decrease the piston diameter
 - ☐ D. Use a longer piston rod

Q.21 Which part of a fan system is most susceptible to vibration-related damage during surge conditions?

- Ans**
- ☐ A. Electrical wiring
 - ☐ B. Blades assembly
 - ☐ C. Housing
 - ☒ D. Bearings and shaft assembly

Q.22 Before lifting a heavy machine with a chain pulley block, which action should be performed first to ensure safety?

- Ans**
- ☐ A. Secure the load properly using ropes only before lifting
 - ☐ B. Apply suitable lubricants to the machine before lifting
 - ☒ C. Inspect all lifting equipment for any visible defects
 - ☐ D. Position all workers directly under the load during lifting

Q.23 A maintenance technician observes a cloudy or milky appearance in an oil sample taken from a hydraulic system. Which condition is most likely indicated by the lubricant analysis?

- Ans**
- ☐ A. Excessive viscosity loss has occurred in the oil
 - ☐ B. Oxidation has degraded the hydraulic oil significantly
 - ☐ C. Thermal degradation has increased oil acidity
 - ☒ D. Water contamination is present in the hydraulic oil

Q.24 For a hypoid gear set transmitting power at 90° with an offset, what is the main advantage over straight bevel gears?

- Ans**
- ☐ A. Quieter operation at all speeds compared to straight bevel gears.
 - ☐ B. Capability to function with intersecting axes at higher speeds.
 - ☒ C. Transmits power between non-intersecting axes with high torque.
 - ☐ D. Lower initial cost for equivalent size and torque rating.

Q.25 What is the common cause of fluid leakage from a pump shaft seal after maintenance?

- Ans**
- ☒ A. Improper installation of gland packing
 - ☐ B. Misaligned coupling
 - ☐ C. Excessive discharge pressure
 - ☐ D. Presence of air lock in pump

Q.26 A resistor has the color bands Yellow, Violet, Brown, and Silver. What resistance value is indicated by this color code?

- Ans**
- ☐ A. 47 kilo ohm $\pm 20\%$
 - ☒ B. 470 ohm $\pm 10\%$
 - ☐ C. 47 ohm $\pm 10\%$
 - ☐ D. 470 ohm $\pm 5\%$

Q.27 How does reducing the supply air pressure to a pneumatic actuator affect its performance if all other factors remain constant?

- Ans**
- ☐ A. Increases the stroke length
 - ☐ B. Increases the actuator speed
 - ☒ C. Reduces the force output
 - ☐ D. Actuator to move a greater distance

Q.28 Which rigging safety strategy should be emphasized when lifting a delicate piece of machinery?

- Ans**
- ☒ A. Use padding at sling contact points
 - ☐ B. Place slings directly on machine edges
 - ☐ C. Use a thicker sling for extra strength
 - ☐ D. Lift the machine quickly to reduce risk

Q.29 In a lever-operated compressor servicing tool (Class 1 lever), if the load arm length is decreased while the effort arm length is kept constant, what will be the effect on its mechanical advantage?

- Ans**
- ☐ A. Mechanical advantage decreases
 - ☐ B. Mechanical advantage remains unchanged
 - ☐ C. Mechanical advantage becomes zero
 - ☒ D. Mechanical advantage increases

Q.30 Which component of an industrial automation system directly converts physical parameters into electrical signals for processing?

- Ans**
- ☐ A. Actuator
 - ☐ B. Controller
 - ☒ C. Sensor
 - ☐ D. Human Machine Interface (HMI)

Q.31 If the 6th division of the vernier scale coincides with a main scale division, the vernier reading is:
[Take least count = 0.1 mm]

- Ans**
- ☒ A. 0.6 mm
 - ☐ B. 0.006 mm
 - ☐ C. 6 mm
 - ☐ D. 0.06 mm

Q.32 A maintenance drawing shows a tapped hole in the base plate of a machine support system. In the plan view, dashed lines are used to represent the major diameter of the thread. What does this indicate?

- Ans**
- ☐ A. The thread is a decorative groove unrelated to fastening.
 - ☒ B. The thread is internal and hidden within the base plate.
 - ☐ C. The thread is a partial thread cut only on the lower half of the fastener.
 - ☐ D. The thread is external and fully visible on the fastener shaft.

Q.33 What is the main function of a flat key in mechanical fasteners?

- Ans**
- ☐ A. To prevent axial movement of the shaft
 - ☐ B. To act as a sealing device between components
 - ☐ C. To align the shaft with the hub precisely
 - ☒ D. To transmit rotational force from the shaft to the hub

Q.34 When dimensioning in a crowded or narrow space on a drawing, which of the following arrowhead types is commonly used to avoid confusion with overlapping lines?

- Ans**
- ☐ A. Closed filled arrow head
 - ☐ B. Double dot terminator
 - ☒ C. Oblique stroke terminator
 - ☐ D. Open arrow head

Q.35 Which operation is NOT suitable for a single cut file?

- Ans**
- ☒ A. Heavy stock removal
 - ☐ B. Truing flat surfaces
 - ☐ C. Deburring edges
 - ☐ D. Fine finishing

Q.36 In a 2-input AND gate used as an enable control circuit, which logic signal must be applied to the enable input to allow pulses to pass through?

- Ans**
- ☐ A. A high-impedance open circuit connection
 - ☐ B. An alternating signal that matches the pulse frequency exactly
 - ☒ C. A constant logic HIGH (1) signal
 - ☐ D. A constant logic LOW (0) signal

Q.37 Calculate the area of an irregular plot using the Trapezoidal Rule, given the offsets are 2 m, 4 m, 3 m, and 5 m at an equal spacing of 1 m.

- Ans**
- ☐ A. 7 m²
 - ☐ B. 12 m²
 - ☐ C. 9.5 m²
 - ☒ D. 10.5 m²

Q.38 Which part of the belt conveyor supports and guides the belt along its path?

- Ans**
- ☒ A. Idler rollers
 - ☐ B. Drive pulley
 - ☐ C. Motor
 - ☐ D. Gearbox

Q.39 A workshop mixes coolant concentrate and water in a 3:2 ratio for a machine cooling system. If the total mixture required is 25 liters, how many liters of coolant concentrate are required?

- Ans**
- ☒ A. 15 liters
 - ☐ B. 12.5 liters
 - ☐ C. 17 liters
 - ☐ D. 10 liters

Q.40 A compressor motor in a workshop is connected to a 240 V supply through a wiring system with a total resistance of 2 ohms. If the motor draws 12 A during operation, what is the voltage measured at the motor terminals?

- Ans**
- ☐ A. 228 V
 - ☒ B. 216 V
 - ☐ C. 192 V
 - ☐ D. 240 V

Q.41 What is the relationship between axis limit switches and the machine zero point in a CNC machine?

- Ans**
- ☒ A. Limit switches help protect the machine zero location
 - ☐ B. Limit switches determine tool length offset
 - ☐ C. Limit switches control spindle speed
 - ☐ D. Limit switches set workpiece zero automatically

Q.42 In an oxy-acetylene cutting torch, which part is responsible for blending oxygen and acetylene before the gases reach the nozzle?

- Ans**
- ☒ A. Mixer chamber
 - ☐ B. Oxygen control valve
 - ☐ C. Flashback arrestor
 - ☐ D. Welding tip

Q.43 While interpreting the drawing of a double-riveted butt joint with equal-width butt straps, which feature indicates a zig-zag riveting arrangement?

- Ans**
- ☐ A. Each plate shows a single rivet row along the joint line
 - ☐ B. Both butt straps extend equally across the joint section
 - ☒ C. Rivet centers in adjacent rows are offset by half the pitch
 - ☐ D. Rivet centerlines in successive rows remain perfectly aligned

Q.44 If a Profibus-DP network in PLC, at 12 Mbps allows only 100 meters per segment, what is the maximum total network length if three segments are connected with repeaters?

- Ans**
- ☐ A. 400 meters
 - ☐ B. 1200 meters
 - ☒ C. 300 meters
 - ☐ D. 200 meters

Q.45 What is a critical operator action after completing an Auto mode cycle?

- Ans**
- ☒ A. Inspecting the finished part for quality assurance
 - ☐ B. Immediately rerunning the same program
 - ☐ C. Starting the next program without checks
 - ☐ D. Ignoring the finished part and moving on

Q.46 A V-belt is specified by its cross-sectional dimensions. Which pair best represents these dimensions?

- Ans**
- ☐ A. Only thickness
 - ☐ B. Only width
 - ☒ C. Width and depth
 - ☐ D. Length and width

Q.47 A welder is preparing to perform arc welding on mild steel plates. Which parameter should be set initially to ensure a stable arc and proper penetration?

- Ans**
- ☐ A. Travel speed
 - ☐ B. Arc length
 - ☒ C. Current setting
 - ☐ D. Electrode angle

Q.48 An engineer is inspecting a batch of bolts in a manufacturing unit. To quickly check if these bolts conform to a specific pitch and profile, which instrument should the engineer use?

- Ans**
- ☐ A. Snap gauge
 - ☒ B. Thread gauge
 - ☐ C. Plug gauge
 - ☐ D. Ring gauge

Q.49 What could most likely cause a pneumatic actuator to move in an irregular or jerky manner?

- Ans**
- ☐ A. Incorrect mounting on the frame
 - ☐ B. Short circuit in electrical wiring
 - ☒ C. Moisture or debris in the air supply
 - ☐ D. Lack of grease in actuator gears

Q.50 In a PLC STL, the sequence LD I2.0, AND I2.1, ORN I2.2, = Q2.0 is used. If I2.0 is ON, I2.1 is ON, and I2.2 is OFF, what does Q2.0 become?

- Ans**
- ☒ A. Q2.0 will be ON
 - ☐ B. Q2.0 will be OFF
 - ☐ C. Q2.0 will hold previous value
 - ☐ D. Q2.0 will toggle

Q.51 Which design feature is most important when upgrading a roller valve for high-cycle applications?

- Ans**
- ☐ A. Increased air flow capacity
 - ☒ B. Durable, wear-resistant material
 - ☐ C. Smaller diameter for faster actuation
 - ☐ D. Requiring higher actuation force

Q.52 An engineer suspects that wind is affecting plumb bob readings during outdoor equipment erection. Which approach best minimizes error due to wind?

- Ans**
- ☒ A. Shield the plumb bob from wind using a temporary screen
 - ☐ B. Wait for wind to stop before taking any measurement
 - ☐ C. Take multiple readings and average the values
 - ☐ D. Use a heavier plumb bob to resist wind movement

Q.53 What is the decimal equivalent of the binary number 101101?

- Ans**
- ☐ A. 47
 - ☐ B. 43
 - ☒ C. 45
 - ☐ D. 49

Q.54 Electric current in a metallic conductor is due to the flow of:

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

Q.55 In a case where a worker suffers a minor hand injury due to slipping tools, the investigation reveals missing guards on several machines. According to safety regulations, what is the most appropriate corrective measure?

- Ans**
- ☒ A. Install and regularly inspect machine guards
 - ☐ B. Rotate staff to different workstations
 - ☐ C. Offer refresher safety training to workers
 - ☐ D. Increase supervision during operations

Q.56 What kind of improper practice most significantly reduces hacksaw blade life during cutting operations?

- Ans**
- ☒ A. Using a blade with inappropriate Teeth Per Inch for the workpiece thickness
 - ☒ B. Applying excessive cutting pressure beyond recommended limits
 - ☒ C. Operating at inconsistent stroke speed during cutting
 - ☒ D. Maintaining improper blade tension during operation

Q.57 An engineer needs to select a coupling for joining two shafts transmitting high torque with precise alignment. Which type of flange coupling is most suitable for this application?

- Ans**
- ☒ A. Muff coupling
 - ☒ B. Bush pin type flange coupling
 - ☒ C. Rigid flange coupling
 - ☒ D. Flexible flange coupling

Q.58 How does the thickness of the zinc coating on a GI pipe affect its performance?

- Ans**
- ☒ A. Increases corrosion resistance
 - ☒ B. Makes pipe more flexible
 - ☒ C. Reduces internal friction
 - ☒ D. Decreases pipe diameter

Q.59 A universal coupling is primarily used to transmit rotary motion between shafts that are:

- Ans**
- ☒ A. Parallel and collinear
 - ☒ B. Inclined to each other and not collinear
 - ☒ C. In the same axis and coplanar
 - ☒ D. Perpendicular but coplanar

Q.60 A supervisor notices that cotton waste is being disposed of with regular garbage. What is a likely consequence of this improper practice in terms of workshop safety?

- Ans**
- ☒ A. Noticeable decrease in air quality
 - ☒ B. Immediate breakdown of workshop machinery
 - ☒ C. Chemical contamination of drinking water
 - ☒ D. Increased risk of fire incidents in the workshop

Q.61 What is the primary function of a selector switch in an industrial control panel?

- Ans**
- ☒ A. Increase supply voltage
 - ☒ B. Select different operating modes
 - ☒ C. Store electrical charge
 - ☒ D. Measure electrical current

Q.62 Which pair of M codes is typically programmed before a manual tool change to stop spindle rotation and disable coolant flow?

- Ans**
- ☒ A. M03 and M08
 - ☒ B. M04 and M08
 - ☒ C. M05 and M08
 - ☒ D. M05 and M09

Q.63 In a pair of meshing gears, what must be equal at the pitch circles?

- Ans**
- ☒ A. The tangential velocities
 - ☒ B. The number of teeth
 - ☒ C. The diameters
 - ☒ D. The angular velocities

Q.64 In limits and tolerances terminology, what is meant by deviation?

- Ans**
- ☐ A. The difference between the maximum size and minimum size limits
 - ☐ B. The theoretical dimension used as reference in engineering drawing
 - ☒ C. The algebraic difference between a size and the corresponding basic size
 - ☐ D. The measured dimension obtained after manufacturing process

Q.65 What effect does improper feeder design have on the formation of bridges in hopper discharge systems?

- Ans**
- ☒ A. By creating uneven flow and restricting material discharge
 - ☐ B. By automatically crushing oversized materials
 - ☐ C. By increasing the material flow uniformly
 - ☐ D. By creating poor alignment between the feeder and hopper geometry

Q.66 An ITI maintenance mechanic is analyzing a steel sample heated above the upper critical temperature. Which phase is primarily present in the iron-carbon diagram at this stage?

- Ans**
- ☐ A. Cementite
 - ☐ B. Ferrite
 - ☒ C. Austenite
 - ☐ D. Pearlite

Q.67 A maintenance mechanic is preparing to create a flat bearing surface at the mouth of a drilled hole on a mild steel workpiece. Which tool is specifically designed for this operation?

- Ans**
- ☒ A. Spot facing tool
 - ☐ B. Reamer
 - ☐ C. Counterbore tool
 - ☐ D. Countersink tool

Q.68 What is the basic mechanism behind the working of a centrifugal pump?

- Ans**
- ☒ A. Conversion of mechanical energy into hydraulic energy
 - ☐ B. Compression of air to increase liquid pressure
 - ☐ C. Direct displacement of liquid using pistons
 - ☐ D. Expansion of gas inside a sealed chamber

Q.69 An operator selects a grinding wheel for finishing a hardened steel shaft. Which grit size is most suitable for achieving a smooth surface finish in this scenario?

- Ans**
- ☐ A. Medium grit size
 - ☐ B. Coarse grit size
 - ☐ C. Large grit size
 - ☒ D. Fine grit size

Q.70 In BIS notation, what does the numerical value preceding the tolerance symbol indicate?

- Ans**
- ☐ A. The difference between upper and lower limits of size
 - ☐ B. The tolerance value obtained during inspection process
 - ☒ C. The basic size of the component specified in the drawing
 - ☐ D. The actual size obtained after manufacturing process

Q.71 Which control method for a 3 by 2 valve would be most appropriate in a hands-free workstation?

- Ans**
- ☐ A. Manual lever operation by hand
 - ☐ B. Automatic timer control
 - ☐ C. Push button operation by hand
 - ☒ D. Foot pedal actuation for the valve

Q.72 Why is the point of a file important for finishing operations?

- Ans**
- ☐ A. It increases tooth sharpness
 - ☐ B. It provides a comfortable grip
 - ☐ C. It absorbs vibrations
 - ☒ D. It allows access to narrow spaces

Q.73 Which machine uses a linear reciprocating cutting motion to machine flat surfaces?

- Ans**
- ☐ A. Drilling machine
 - ☒ B. Shaper machine
 - ☐ C. Milling machine
 - ☐ D. Lathe machine

Q.74 Frequent machine breakdowns primarily cause a loss of downtime under which component of Overall Equipment Effectiveness (OEE)?

- Ans**
- ☐ A. Productivity
 - ☒ B. Availability
 - ☐ C. Performance
 - ☐ D. Quality

Q.75 Which of the following tool materials is most commonly used in multi-point cutting tools like drills and milling cutters?

- Ans**
- ☒ A. High-speed steel (HSS)
 - ☐ B. Cast alloy steel
 - ☐ C. Ceramic tool material
 - ☐ D. Carbon tool steel