



रेल भर्ती बोर्ड / RAILWAY RECRUITMENT BOARDS
सी ई एन - ०१/२०२५ - CEN - 01/2025
सहायक लोको पायलट की भर्ती/ Recruitment of Assistant Loco Pilot

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

* 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 Why is a room thermometer generally mounted vertically on a wall?

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

Q.2 Why does biomedical waste require special handling compared to general municipal waste?

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

Q.3 Pipes A and B can fill an entire tank in 8 hours and 12 hours, respectively. The water tank is one-fourth full. If both the pipes are opened together, then how long will it take to fill the remaining part of the tank?

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

Q.4 A pump can fill a tank in 3 hours. Due to a leak in the tank, it takes 4.5 hours to fill the tank. In how much time can the leak empty the full tank if no other entry or exit routes are open?

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

Q.5 In a certain code language, 'SOIL' is coded as '1547' and 'COIL' is coded as '7124'. What is the code for 'C' in the given code language?

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

Q.6 If the mean of the following data is 45, then what is the value of x?

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

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

Q.7 Why does restricting certain chemical refrigerants effectively reduce damage to the ozone layer?

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

Q.8 Refer to the following letter series and answer the question that follows. (Counting to be done from left to right only.)

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

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

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

Q.9 Which symbol best represents a battery in an electric circuit diagram according to standard conventions?

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

Q.10 Which statement best describes the front view in an engineering drawing?

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

Q.11 A car travels from point A to point B in a zigzag path, covering a total distance of 200 meters. If the shortest straight-line distance between A and B is 120 meters, which statement best describes the car's distance and displacement?

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

Q.12 If $3x - 2y + 3z = 8$, $4x - 3y + 2z = 4$ and $2x + y - z = 1$, then find x, y and z, respectively.

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

Q.13 Five students, N, O, R, S and T, have different heights. T is taller than N. R is taller than S but shorter than O. S is taller than N. More than two people are taller than T. How many people are shorter than R?

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

Q.14 When drawing repeated 67° angles on an engineering sheet, which practice best helps minimize cumulative alignment errors?

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

Q.15 Which type of personal protective equipment is most suitable for tasks involving airborne chemical particles in confined spaces?

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

Q.16 Which color is universally associated with emergency exit signs in industrial workplaces under international standards?

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

Q.17 An engineering firm is tasked with creating a set of technical drawings for a large-scale project. The client specifies that all components must fit on a single sheet without reducing the drawing scale, and the total drawing area required is approximately 1 square meter. Based on standard drawing sheet sizes, which sheet should the firm select to best meet these requirements?

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

Q.18 The price of sugar is increased by 20%. Manoj can increase his expenditure on sugar by only 15% from his income. In order to balance his expenditure, by what percentage should he reduce the quantity of sugar consumed?

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

Q.19 A hiker lifts a backpack from the ground to a ledge 2 meters above the ground. Which situation would result in the greatest increase in the backpack's gravitational potential energy?

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

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

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

Q.21 What should come in place of the question mark (?) in the given series?

1 2 7 20 61 ?

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

Q.22 Read the given statement(s) and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statement(s).

Statements:

Some rugs are fans.

No fan is a car.

Conclusion (I) : Some rugs are cars.

Conclusion (II) : Some fans are rugs.

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

Q.23 In a certain code language,
A + B means 'A is the mother of B',
A – B means 'A is the brother of B',
A × B means 'A is the wife of B' and
A % B means 'A is the father of B'.

How is Satish related to Mayank if 'Satish + Deep × Piyush – Hitesh % Mayank'?

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

Q.24 A, B, C, D and E have different heights. E is taller than C but shorter than A. Only one person is taller than A. D is shorter than C. Who amongst them is the third tallest?

- Ans**
- ✓ A. E
 - ✗ B. B
 - ✗ C. C
 - ✗ D. A

Q.25 What information does a kilometer stone provide to travelers on a road?

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

Q.26 Which of the following correctly states the full form of CD and the technology used to store data on it?

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

Q.27 A cyclist travels 120 km in 3 hours, rests for 1 hour, and then travels another 80 km in 2 hours. To determine the cyclist's average speed for the entire journey, which of the following quantities should be used?

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

Q.28 A sum of money invested at simple interest amounts to ₹21,500 in 5 years and ₹26,000 in 8 years. Find the principal amount (in ₹).

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

Q.29 A crane lifts a 200 kg load to a height of 15 meters in 10 seconds. Assuming acceleration due to gravity is 10 m/s^2 and energy loss is negligible, what is the power output of the crane during this operation?

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

Q.30 Which statement best describes how the mass and speed of an object affect its kinetic energy?

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

Q.31 Refer to the given letter series and answer the question that follows.

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

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

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

Q.32 Two sets of numbers are given below. In each set of numbers, certain mathematical operation(s) on the first number result(s) in the second number. Similarly, certain mathematical operation(s) on the second number result(s) in the third number and so on. Which of the given options follows the same set of operations as in the given sets? (NOTE: Operations should be performed on the whole numbers, without breaking down the numbers into their constituent digits. E.g. 13 – Operations on 13 such as adding to/subtracting from/multiplying with 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed.)

6 – 16 – 23 – 32; 7 – 19 – 26 – 35

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

Q.33 A cyclist travels from the kilometer stone marked 52 to the stone marked 79. How far has the cyclist traveled?

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

Q.34 Which tool safety measure best prevents injuries when cleaning a workshop lathe after use?

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

Q.35 A ramp is used to lift a box to a platform 2 m high. To reduce the effort required, the ramp length is increased from 4 m to 8 m. Assuming negligible friction, what remains unchanged?

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

Q.36 If a rectangular field is measured to be 120 meters long and 75 meters wide, what is its area in SI units?

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

Q.37 A question is followed by two statements numbered (I) and (II). You have to decide whether the data provided in the statements are sufficient to answer the question. Read both the statements and decide the appropriate answer.

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

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

(II) M is taller than D.

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

- Q.38** A group of numbers/symbols is coded using letter codes as per the codes given below and the conditions that follow. The correct combination of codes following the conditions is your answer.
Note: If none of the conditions follow, then the codes for the respective number/symbol are to be followed directly as given in the table.

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

Conditions –

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

What will be the code for the following group?
& 8 \$ 9 5

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

- Q.39** A dealer buys a table for ₹2,750. He first marks it up by 28%, then allows a 12% discount to a customer. If the customer also pays 5% GST on the selling price, find the profit percentage (excluding GST) made by the dealer.

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

- Q.40** Simplify the following expression.

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

- Ans ☒ A. 44
☒ B. 48
☒ C. 36
☒ D. 40

- Q.41** An article is bought for ₹300 and its price is increased by 5.5%. The resulting price is then reduced by 8%. Find the final selling price.

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

- Q.42** What is the primary role of the Central Processing Unit (CPU) in a computer system?

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

- Q.43** A laboratory thermometer has a range from -10 degrees Celsius to 110 degrees Celsius and 120 equal divisions. What is the smallest value that this thermometer can read?

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

Q.44 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. PJ-QK
 - ☒ B. HB-IC
 - ☒ C. FZ-GA
 - ☒ D. RL-SN

Q.45 Sohan covers a total distance of 760 km to reach his home, traveling partly by train and partly by car. He takes 8 hours when he travels 160 km by train and the rest by car. If he travels 240 km by train and the remaining distance by car, his journey takes 12 minutes longer. Find the difference between the speeds of the train and the car.

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

Q.46 Two trains are moving in opposite directions. The first train is 120 m long and runs at 54 km/h. The second train is 180 m long and runs at 72 km/h. How much time will they take to cross each other completely?
(Rounded up to two decimal places)

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

Q.47 12 is related to 1730 following a certain logic. Following the same logic, 13 is related to 2199. To which of the given options is 11 related, following the same logic?
(NOTE: Operations should be performed on the whole numbers, without breaking down the numbers into their constituent digits. E.g. 13 – Operations on 13 such as adding/subtracting/multiplying etc. to 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed.)

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

Q.48 Find the compound interest on ₹5,70,000 for 1.5 years at 10% per annum compounded half-yearly.

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

Q.49 Which factor increases the amount of heat produced in a wire when an electric current flows through it for a fixed time?

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

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. IT – KV
 - ☐ B. SJ – TK
 - ☐ C. DG – EH
 - ☐ D. KE – LF

Q.51 An astronaut weighs 600 N on Earth. During a moon mission, she performs an experiment to measure her weight on the moon. Which value is closest to her expected weight on the moon, and why?

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

Q.52 Seven boxes S, T, U, V, W, X, and Y are kept one over the other but not necessarily in the same order. U is kept exactly third from the top. Only one box is kept between U and T. W is kept immediately above T. Only three boxes are kept between X and S. V is kept on one of the positions below Y. Only two boxes are kept between U and S. Which box is kept second from the top?

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

Q.53 A cyclist rides 60 meters north, then 80 meters south, and finally 70 meters north. What is the total distance the cyclist has traveled?

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

Q.54 A 42-litre solution has sugar and water in the ratio 2 : 5. If, due to evaporation, the volume is reduced by 35%, and only water evaporates, what is the new ratio of sugar to water?

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

Q.55 G is the mother of Y. Y is the sister of V. S is the father of L. L is the son of V. How is G related to L?

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

Q.56 What should come in place of the question mark (?) in the given series based on the English alphabetical order?

MDB PHE SLH VPK ?

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

Q.57 An engineer is updating a schematic for a control panel and needs to indicate a normally closed push button. Which approach best ensures the symbol is universally understood among engineers referring to standard engineering drawings?

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

Q.58 Which intervention most effectively reduces ground-level pollutant concentrations during a winter temperature inversion?

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

Q.59 Refer to the given letter series and answer the question that follows. Counting to be done from left to right only.

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

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

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

Q.60 What is the primary color used in warning signs to alert workers of potential hazards?

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

Q.61 Which combination best describes the main environmental challenges associated with plastic waste management?

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

Q.62 The first shopkeeper allows two successive discounts of 3% and 7%, while a second shopkeeper allows two successive discounts of 2% and 8%. A third shopkeeper allows 10% discount on the same item. From which shopkeeper should a customer buy if the marked price is the same at the three shops?

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

Q.63 Which scenario best demonstrates proactive workplace safety behavior?

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

Q.64 A, B, C, D, X, Y and Z are sitting around a circular table facing the centre of the table.
Only two people sit between Y and C when counted from the left of C. D sits third to the left of B. A sits to the immediate right of B. A sits second to the left of Y. Z is not an immediate neighbor of D.
Who sits third to the right of X?

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

Q.65 What does the term 'HAZOP' stand for in occupational safety?

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

Q.66 Let C be a circle, and AB and DE be two chords on C such that AB = BE. In the quadrilateral ABED, let AE and BD intersect at F, $\angle DBE = 55^\circ$ and $\angle BAE = 40^\circ$. Find $\angle FED$.

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

Q.67 Which of the following statements best describes a triangle as used in engineering drawing?

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

Q.68 What will come in place of the question mark (?) in the following equation if '+' and '-' are interchanged and 'x' and '÷' are interchanged?
 $42 \times 6 \div 7 - 35 + 19 = ?$

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

Q.69 Which one of the following statements correctly describes a characteristic of WANs?

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

Q.70 A question is followed by two statements numbered (I) and (II). You have to decide whether the data provided in the statements are sufficient to answer the question. Read both the statements and select the most appropriate answer.

Question:

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

Statements:

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

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

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

Q.71 Why are electric wires in household appliances usually covered with plastic or rubber coating?

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

Q.72 Select the pair which follows the same pattern as that followed by the two pairs given below. Both pairs follow the same pattern.

ZOT - TLP

NIL - HFH

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

Q.73 What is a key feature of single stroke lettering in technical drawings?

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

Q.74 A boy uses a wheelbarrow to carry sand. The wheel acts as the pivot, the sand is placed in the tray, and the boy lifts the handles. In this arrangement, the sand represents

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

Q.75 P, Q and R are three batsmen. The ratios of runs scored by them in a certain match were as follows:

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

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

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

Q.76 A technician needs to select a fuse wire for a room heater. Which property should be considered most important for safety based on the heating effect of electric current?

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

Q.77 Seven boxes, P, Q, S, T, U, V, and W, are kept one over the other, but not necessarily in the same order. There are exactly two boxes between T and P. Only Q is kept above U. No box is kept below P. S is kept somewhere below W but above V. Based on the given information, which box is kept third above V?

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

Q.78 What does CPU stand for in computing?

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

Q.79 Srinu starts from his home and drives 2 km towards the south, then takes a right turn and drives 5 km. He then takes a right turn and drives 6 km before taking a right turn again and driving 4 km further. Srinu finally takes a right turn and drives 4 km before stopping at his office. In which direction should Srinu drive to reach his home again? (All turns are 90-degree turns only unless specified.)

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

Q.80 When a cutting plane line passes through a hole and a rib, which feature should be sectioned in the resulting view according to standard conventions?

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

Q.81 If 2 is subtracted from each odd digit and 2 is added to each even digit in the number 235234796423, what will be the sum of the digits that are third from the left and third from the right?

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

Q.82 Which of the following is the best example of municipal solid waste?

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

Q.83 A solid right circular cone is 7 cm high, and the radius of its base is 22.2 cm. It is melted and recast into a right circular cone with radius of its base 3.7 cm. Then the height (in cm) of the cone is _____.

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

Q.84 What should come in place of '?' in the given series?
11, 22, 44, 88, 176, ?

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

Q.85 The cost of a diamond varies directly with the square of its weight. A diamond broke into four pieces with weights in the ratio 2:4:1:3. If it had been broken into four equal pieces, the loss would have been ₹60,000. What was the original cost of the diamond?

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

Q.86 The average of five numbers is 30. If four of the numbers are 25, 35, 28 and 32, then what is the fifth number?

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

Q.87 A plane parallel to the base divides a cone of height 40 cm into two parts. If the volume of the upper smaller cone formed is $\frac{1}{64}$ of the volume of the original cone, calculate the height of the plane from the base of the cone.

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

Q.88 Which of the following statements best describes a cuboid as used in engineering drawing?

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

Q.89 What is the primary purpose of a Local Area Network (LAN)?

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

Q.90 If the height of an object is doubled while its mass remains constant, its gravitational potential energy will be:

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

Q.91 A ladder is leaning against a wall and makes an angle of 60° with the ground. If the length of the ladder is 24 m, find the distance of the foot of the ladder from the wall.

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

Q.92 Which of the following pairs of numbers is co-prime?

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

Q.93 SANZ is related to YUTT in a certain way based on the English alphabetical order. In the same way, MTHM is related to SNNG. To which of the following is LJRE related to following the same logic?

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

Q.94 The mean of 11 numbers is 10.9. If the mean of the first 6 numbers is 10.5 and the mean of the last 6 numbers is 11.4, then find the 6th number.

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

Q.95 What will come in the place of '?' in the following equation, if '+' and '-' are interchanged and 'x' and '÷' are interchanged?
 $5 \div 3 + 15 \times 5 - 3 = ?$

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

Q.96 Which statement best describes the side view in engineering drawing?

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

Q.97 Read the given statement(s) and conclusions carefully. Assuming that the information given in the statement(s) is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statement(s).

Statements:

All chocolates are paneers.
 No paneer is a milk.

Conclusions:

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

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

Q.98 Which of the following letter-number clusters will replace the question mark (?) in the given series to make it logically complete?

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

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

Q.99 If $x + \frac{1}{x} = 5$, then $\frac{x^3 - 5x^2 + 5x}{x^2 + 1}$ is equal to:

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

Q.100 Which of the following best describes the function of a speedometer in a vehicle?

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

Q.1 Which characteristic best describes a Barrette file used in fitting work?

- Ans**
- ☐ A. It has round surfaces with teeth on all sides for enlarging holes
 - ☐ B. It has curved edges with double cut teeth for rapid metal removal
 - ☐ C. It has square faces with rough teeth for cutting keyways
 - ☒ D. It has a flat triangular face with teeth only on the wide surface

Q.2 A workshop needs to transfer power across two parallel shafts using an open belt drive. If the center distance between the pulleys is increased while keeping pulley sizes unchanged, what is the most likely result regarding the required belt length?

- Ans**
- ☒ A. The required belt length increases to maintain proper tension
 - ☐ B. The required belt thickness increases to maintain proper grip
 - ☐ C. The required belt length remains unchanged for correct operation
 - ☐ D. The required belt length decreases to maintain proper tension

Q.3 Which of the following statements correctly describes the use of Allen keys in fitting accessories?

- Ans**
- ☐ A. Allen keys are used to tighten nuts with square holes.
 - ☐ B. Allen keys are used to adjust screws with slotted heads.
 - ☒ C. Allen keys are used for tightening or loosening hex socket screws.
 - ☐ D. Allen keys are used to turn screws with round heads only.

Q.4 What is the main reason silver is used in high-quality electrical contacts?

- Ans**
- ☐ A. Superior corrosion resistance
 - ☐ B. High thermal conductivity
 - ☐ C. Mechanical strength
 - ☒ D. Excellent electrical conductivity

Q.5 In a gang drilling machine, how are the spindles typically arranged?

- Ans**
- ☒ A. In a straight line on a common table
 - ☐ B. In a circular pattern around the table
 - ☐ C. Vertically stacked above each other
 - ☐ D. Randomly positioned on the base

Q.6 A heavy-duty belt drive requires reliable torque transmission without relative motion between the pulley and shaft. Which additional element is recommended for a split pulley?

- Ans**
- ☐ A. Crowning
 - ☐ B. Bush bearing
 - ☒ C. Sunk key
 - ☐ D. Set screw

Q.7 Which property makes tin suitable for coating steel sheets used in food containers?

- Ans**
- ☐ A. High hardness
 - ☐ B. High magnetic permeability
 - ☒ C. High corrosion resistance
 - ☐ D. High tensile strength

Q.8 Which of the following is the most important reason for providing continuous ventilation while working in a confined space?

- Ans**
- ☐ A. To control dust generated during work
 - ☐ B. To reduce noise levels for workers
 - ☐ C. To keep the confined space cool
 - ☒ D. To prevent the build-up of hazardous gases

Q.9 Which tool is best suited for shifting heavy machinery during erection by applying leverage, given constraints on space and need for controlled movement?

- Ans**
- ☐ A. Hammer is used to move heavy objects with leverage in restricted areas
 - ☐ B. Pipe wrench is used to move heavy objects with leverage in restricted areas
 - ☒ C. Crowbar is used to move heavy objects with leverage in restricted areas
 - ☐ D. Spanner is used to move heavy objects with leverage in restricted areas

Q.10 Which part of the Vernier height gauge is used to mark lines on the workpiece surface?

- Ans**
- ☐ A. Clamp screw
 - ☐ B. Vernier scale
 - ☐ C. Fine adjustment screw
 - ☒ D. Scriber

Q.11 A workshop supervisor needs to mix two types of oils in a ratio so that the resulting mixture maintains the same performance as the original oils used separately. If the first oil costs 60 rupees per liter and the second oil costs 80 rupees per liter, in what ratio should these be mixed to get a mixture worth 70 rupees per liter?

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

Q.12 During maintenance, an employee notices that a hydraulic press is unable to lift the usual load even though the input force remains the same. Based on Pascal's Law, which scenario could be responsible for this failure?

- Ans**
- ☐ A. Using more hydraulic fluid while keeping pressure the same improves lifting
 - ☐ B. Increasing the input force beyond the usual value causes lifting failure
 - ☐ C. Replacing the fluid with a heavier type increases lifting capacity
 - ☒ D. A leak in the hydraulic line reduces pressure transmission to the lifting piston

Q.13 In a workshop, you need to fill a cylindrical tank with a liquid. The tank has a diameter of 1 meter and a height of 2 meters. Which method will give you the most accurate measurement of the tank's volume before filling it?

- Ans**
- ☐ A. Use the formula for the volume of a cube with the tank's height as a side
 - ☒ B. Calculate using the formula for the volume of a cylinder based on precise measurements
 - ☐ C. Measure the circumference and assume the tank is a sphere to calculate volume
 - ☐ D. Estimate by visual inspection and compare with other tanks

Q.14 In a basic hydraulic circuit, what is the function of the reservoir in relation to the other system components?

- Ans**
- ☐ A. Hydraulic filter removes contaminants from the hydraulic fluid during operation
 - ☒ B. Hydraulic reservoir stores and supplies fluid to the system continuously
 - ☐ C. Hydraulic pump is used to generate pressure for fluid movement
 - ☐ D. Pressure relief valve is used to control the maximum system pressure

Q.15 Which of the following best describes the method of operating HP (High Pressure) welding equipment in metal joining processes?

- Ans**
- ☐ A. The regulator can be ignored during normal operation
 - ☐ B. Only turning on the gas supply is necessary for operation
 - ☒ C. The torch and regulator must be adjusted to control the gas flow accurately
 - ☐ D. The equipment should be operated at maximum pressure for better results

Q.16 What is a butt joint in welding as per BIS SP 46-1988?

- Ans**
- ☐ A. A joint where two metal pieces are overlapped and welded
 - ☐ B. A joint where two metal pieces are placed at right angles and welded
 - ☐ C. A joint where two metal pieces are joined at an edge not in the same plane
 - ☒ D. A joint where two metal pieces are placed end to end and welded together

Q.17 The grade of a grinding wheel indicates:

- Ans**
- ☐ A. Cutting depth
 - ☒ B. Bond strength
 - ☐ C. Wheel speed
 - ☐ D. Grain size

Q.18 Which parameter must be lowered to decrease tool wear while machining a tough alloy material?

- Ans**
- ☐ A. Depth of cut
 - ☐ B. Feed rate
 - ☐ C. Rake angle
 - ☒ D. Cutting speed

Q.19 Which arrow head type is not recommended for dimension lines when preparing engineering drawings for fabrication tasks?

- Ans**
- ☐ A. Slashed arrow head
 - ☐ B. Open arrow head
 - ☐ C. Closed and filled arrow head
 - ☒ D. Dotted arrow head

Q.20 Why does the vernier scale contain slightly different spacing than the main scale?

- Ans**
- ☒ A. To create a measurable difference between scales
 - ☐ B. To obtain fractional readings smaller than one main scale division
 - ☐ C. To help align the vernier zero with the main scale zero
 - ☐ D. To allow comparison between main scale and vernier scale divisions

Q.21 A workshop assembly requires joining two metal plates to withstand vibrations without loosening over time. Which mechanical jointing method is most suitable for this requirement?

- Ans**
- ☐ A. Using permanent spot welding process
 - ☒ B. Using lock nuts and spring washers
 - ☐ C. Using standard threaded fasteners only
 - ☐ D. Using solid rivets for fixed assembly

Q.22 In which situation would wrought iron be a better choice than cast iron?

- Ans**
- ☐ A. Where maximum compressive strength is needed
 - ☐ B. Where high wear resistance is essential
 - ☐ C. Where vibration damping is a priority
 - ☒ D. Where ductility and shock resistance are required

Q.23 During a welding operation in a workshop, a 10-meter extension cable rated for 5 amperes is used to power a portable grinder that draws 8 amperes. To prevent electrical accidents, which corrective action should be taken before starting work?

- Ans**
- ☐ A. Leave the existing extension cable unchanged and work quickly
 - ☐ B. Reduce the grinder running time to minimize overload risk
 - ☒ C. Replace the extension cable with one rated for at least 8 amperes
 - ☐ D. Use a longer cable rated for 3 amperes to increase distance from the source

Q.24 Bolted joints are preferred because they are:

- Ans**
- ☒ A. Easy to assemble
 - ☐ B. Difficult to remove
 - ☐ C. Permanent only
 - ☐ D. Heavy in weight

Q.25 How does a hole gauge achieve higher accuracy in measurement?

- Ans**
- ☐ A. Using magnetic alignment measurement method
 - ☐ B. Using multi-point laser scanning system
 - ☒ C. Using two-point contact with split ball ends
 - ☐ D. Using fluid-based expansion mechanism

Q.26 A drawing shows two steel plates joined with a continuous fillet weld along one edge, and the drawing specifies a welding symbol with the fillet shape filled in and a reference line beneath. Based on this drawing, which interpretation is correct about the weld placement and its representation?

- Ans**
- ☐ A. The weld should be placed on the arrow side but as an intermittent fillet
 - ☒ B. The weld is to be placed on the arrow side with a continuous fillet along the joint
 - ☐ C. The weld is to be placed on the other side with an intermittent fillet
 - ☐ D. The weld should be a groove type applied on both sides of the plates

Q.27 Which situation requires the use of a reamer?

- Ans**
- ☐ A. When removing large amounts of material quickly
 - ☐ B. When rough shaping a workpiece
 - ☐ C. When making holes in wood
 - ☒ D. When a highly accurate hole diameter is needed

Q.28 Which cutting tool is primarily used to produce a smooth, flat face perpendicular to the workpiece axis?

- Ans**
- ☐ A. Boring tool
 - ☐ B. Turning tool
 - ☐ C. Knurling tool
 - ☒ D. Facing tool

Q.29 A material that fractures with very little or no plastic deformation is said to exhibit:

- Ans**
- ☐ A. Toughness
 - ☒ B. Brittleness
 - ☐ C. Elasticity
 - ☐ D. Ductility

Q.30 Vibration during hacksawing can be minimized by:

- Ans**
- ☐ A. Steady strokes and proper grip
 - ☐ B. Increasing cutting speed within recommended limits
 - ☒ C. Maintaining proper blade tension
 - ☐ D. Using correct blade pitch (TPI)

Q.31 Which of the following is a key purpose of implementing preventive maintenance in workshop equipment?

- Ans**
- ☐ A. To schedule downtime for the longest possible periods of production.
 - ☐ B. To use maintenance only for minor workshop tools and accessories.
 - ☒ C. To reduce unexpected breakdowns and improve equipment reliability.
 - ☐ D. To focus only on repair activities after equipment failure occurs.

Q.32 Using anti-stick compounds on gaskets may cause:

- Ans**
- ☐ A. Longer service life
 - ☐ B. Increased strength
 - ☒ C. Premature failure
 - ☐ D. Improved sealing

Q.33 Which tap in a standard set is best suited for starting a thread in a new hole?

- Ans**
- ☐ A. Flat bottomed tap
 - ☐ B. Bottoming tap
 - ☒ C. Taper tap
 - ☐ D. Thread chaser

Q.34 Which application is suited for a 5 by 2 valve in pneumatic systems?

- Ans**
- ☐ A. It is suited for pressure release and exhaust control
 - ☐ B. It is best for adding lubrication to compressed air
 - ☒ C. It is used for double acting cylinder direction control
 - ☐ D. It is used for single acting cylinder simple movement

Q.35 Which material will deform plastically first when temperature rises during a lathe operation?

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

Q.36 Pig iron is produced in a blast furnace using iron ore, coke, and limestone. In this process, coke acts as:

- Ans**
- ☐ A. Flux
 - ☒ B. Fuel
 - ☐ C. Coolant
 - ☐ D. Impurity

Q.37 Which factor affects the velocity ratio in a simple gear train during workshop assembly tasks?

- Ans**
- ☒ A. The number of teeth on the driver and driven gears
 - ☐ B. The shaft length between the two connected gears
 - ☐ C. The material used for making the gear wheels
 - ☐ D. The module size selected for the gear teeth

Q.38 When preparing an orthographic projection of a rectangular block resting with its largest face on the horizontal plane, which view will accurately represent the true shape and size of that face?

- Ans**
- ☐ A. The side view drawn at 45 degrees to the projection plane
 - ☐ B. The front view drawn perpendicular to the reference line
 - ☐ C. The auxiliary view drawn from an inclined axis
 - ☒ D. The top view drawn parallel to the horizontal reference line

Q.39 Why is the beam of a vernier caliper made long and rigid during construction?

- Ans**
- ☐ A. To provide a straight guide for smooth sliding jaw movement
 - ☐ B. To provide a stable reference surface for accurate measurement
 - ☐ C. To reduce the least count of the instrument
 - ☒ D. To support long measurement range without bending

Q.40 If the tolerance zone is completely above the basic size line, how is it indicated as per BIS?

- Ans**
- ☐ A. By using only negative deviation values
 - ☐ B. By using zero deviation values
 - ☐ C. By combining positive and negative deviations
 - ☒ D. By using only positive deviation values

Q.41 In a quick cut die stock, the two die halves are held securely by:

- Ans**
- ☒ A. A threaded guide plate
 - ☐ B. A tapered retaining ring
 - ☐ C. A spring-loaded clamp
 - ☐ D. A locking pin and washer

Q.42 When integrating a solenoid valve into a sequence control circuit for a machining process, what is a potential effect if the return spring inside the valve is damaged or missing?

- Ans**
- ☐ A. The electrical consumption of the valve decreases significantly
 - ☒ B. The valve may fail to return to its original position after de-energization
 - ☐ C. Continuous air supply to the actuator is ensured for all cycles
 - ☐ D. The valve cycles faster, improving process speed in the workshop

Q.43 Due to low thermal conductivity, laminated phenolic bearings require:

- Ans**
- ☒ A. Cooling system
 - ☐ B. Hard coating
 - ☐ C. Metal lining
 - ☐ D. Surface hardening

Q.44 What happens when the feed rate is too high during turning?

- Ans**
- ☐ A. Surface finish improves significantly
 - ☒ B. Cutting force and roughness increase
 - ☐ C. Tool wear decreases completely
 - ☐ D. Spindle speed reduces automatically

Q.45 Which type of bearing is specifically designed to support axial loads in machinery?

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

Q.46 Which of the following best describes the proper use and maintenance of a chipping hammer during welding operations?

- Ans**
- ☐ A. Use the chipping hammer before welding to clean oil from the surface and safely store it with welding rods.
 - ☐ B. Use the chipping hammer to shape the welded joint before welding and occasionally sharpen its pointed tip properly with a flat file.
 - ☒ C. Use the chipping hammer to remove slag after welding and keep the hammer clean to ensure effective slag removal.
 - ☐ D. Use the chipping hammer during welding to cool the joint and wipe its handle carefully with oil after every use.

Q.47 How is a small-diameter straight shank drill usually held in the tailstock?

- Ans**
- ☐ A. With a dog carrier
 - ☒ B. With a drill chuck
 - ☐ C. With a Morse taper
 - ☐ D. With a sleeve adapter

Q.48 A workshop supervisor needs a tool for scribing and layout work in a confined space. Which feature of the Hermaphrodite Caliper makes it different from other calipers?

- Ans**
- ☒ A. One leg ends in a pointed tip while the other has a caliper jaw
 - ☐ B. Both legs have sharp pointed tips for accurate marking work
 - ☐ C. One leg is straight while the other leg carries a flat measuring edge
 - ☐ D. Both legs are straight and parallel to each other

Q.49 A belt drive operating at a speed of 8 m/s is used to transmit a small amount of power in an agricultural machine. How is this drive classified?

- Ans**
- ☒ A. Light drive
 - ☐ B. Heavy drive
 - ☐ C. Compound drive
 - ☐ D. Medium drive

Q.50 Which problem is most likely to occur if a lathe tool's cutting angles are not ground properly?

- Ans**
- ☐ A. Excessive tool length
 - ☒ B. Poor surface finish
 - ☐ C. Problems with storing the tool
 - ☐ D. Issues with tool magnetism

Q.51 A machine drawing specifies an M12 screw for assembly. What does 'M12' indicate about the screw?

- Ans**
- ☐ A. The pitch length of the screw is 12 mm
 - ☐ B. The screw length is 12 mm
 - ☐ C. The screw head diameter is 12 mm
 - ☒ D. The major diameter of the screw is 12 mm

Q.52 During the fabrication of a machine base, an engineering drawing is provided with detailed dimensioning. What is the main purpose of these dimensioned drawings in the workshop setting?

- Ans**
- ☐ A. To indicate the type of material to be used for the part
 - ☐ B. To show the required surface finish for each feature
 - ☒ C. To provide exact sizes and locations for manufacturing parts accurately
 - ☐ D. To mark guidelines for the workshop before cutting begins

Q.53 In wet lapping, the abrasive compound is mixed with a liquid medium before application. Which substance is specifically mentioned for mixing with the abrasive powder?

- Ans**
- ☐ A. Alcohol as cleaning medium
 - ☐ B. Water as cooling medium
 - ☐ C. Glycerine as bonding medium
 - ☒ D. Kerosene as liquid medium

Q.54 Which measurement tool is most appropriate for checking the major diameter of a screw thread?

- Ans**
- ☐ A. Feeler gauge
 - ☐ B. Thread pitch gauge
 - ☐ C. Depth gauge
 - ☒ D. External micrometer

Q.55 When selecting an electrode for ARC welding mild steel structures exposed to variable weather conditions, which factor is most critical to ensure weld durability and integrity?

- Ans**
- ☐ A. Selecting an electrode with high current carrying capacity to increase speed
 - ☐ B. Using an electrode with higher tensile strength to match the base metal
 - ☐ C. Picking an electrode with fast deposition rate for quicker completion
 - ☒ D. Choosing an electrode with low hydrogen content to minimize cracking risk

Q.56 Which statement best explains the primary use of red lead in marking media for ITI Fitter Trade work?

- Ans**
- ☐ A. Red lead is applied as a lubricant for smooth movement of measuring instruments.
 - ☐ B. Red lead is used for cleaning measuring instruments before use.
 - ☒ C. Red lead is applied to surfaces to make scribed lines more visible during layout work.
 - ☐ D. Red lead is used for protecting measuring tools from rust during storage.

Q.57 In a cast iron pulley, the rim is connected to the central boss through structural members whose cross-section is generally elliptical. What are these members called?

- Ans**
- ☐ A. Bushes
 - ☐ B. Flanges
 - ☐ C. Keys
 - ☒ D. Arms/Spokes

Q.58 What is the orientation of the peen relative to the handle in a straight peen hammer?

- Ans**
- ☐ A. Perpendicular to the axis of the hammer handle
 - ☐ B. At sixty degrees to the hammer handle
 - ☒ C. Parallel to the axis of the hammer handle
 - ☐ D. At forty five degrees to the hammer handle

Q.59 In an assembly process, which sealing method is most appropriate to prevent oil leakage between two precisely machined flanges when disassembly may be required for maintenance?

- Ans**
- ☐ A. Sealing with adhesive compounds
 - ☐ B. Filling the joint with welding material
 - ☒ C. Using a preformed gasket between the flanges
 - ☐ D. Applying a thread sealant to the surfaces

Q.60 What is the standard material used for hacksaw blades in adjustable frames?

- Ans**
- ☐ A. Alloy tool steel
 - ☒ B. High carbon steel
 - ☐ C. Tungsten carbide
 - ☐ D. Mild steel

Q.61 Which component in a pneumatic system stores compressed air before it is distributed to the workshop machines?

- Ans**
- ☒ A. The air receiver tank stores compressed air for later use
 - ☐ B. A regulator controls the pressure supplied to equipment
 - ☐ C. A filter removes moisture and dust from the air
 - ☐ D. An air compressor generates compressed air for distribution

Q.62 What is the primary advantage of using a hydraulic bending machine for G.I. and M.S. pipes?

- Ans**
- ☐ A. It cleans pipe surfaces without using chemical solutions.
 - ☐ B. It cuts pipes accurately without producing metal shavings.
 - ☒ C. It bends pipes without requiring sand filling inside the pipe.
 - ☐ D. It joins pipes permanently without requiring threaded fittings.

Q.63 What is the main function of a pipe bending machine in pipe fitting work?

- Ans**
- ☐ A. To join two pipes together permanently using welding methods
 - ☒ B. To change the direction of a pipe without cutting it
 - ☐ C. To cut a pipe accurately to the required length
 - ☐ D. To create threads on the ends of a pipe for connections

Q.64 Which item is essential to wear for personal safety in a mechanical workshop?

- Ans**
- ☐ A. Earplugs
 - ☐ B. Regular shoes
 - ☒ C. Safety goggles
 - ☐ D. Wrist watch

Q.65 Which actuator type converts compressed air energy into linear motion for clamping during a machining operation?

- Ans**
- ☐ A. Rotary actuator is used to convert air into rotary motion for cutting
 - ☐ B. Diaphragm actuator is used for precise control in regulating pressure
 - ☒ C. Single-acting cylinder actuator is used to generate linear motion for clamping tasks
 - ☐ D. Double-acting cylinder actuator is used for tasks requiring motion in both directions

Q.66 In a gear set, which circle is used as the reference to determine the point where two gears effectively make contact and transfer motion?

- Ans**
- ☒ A. Pitch circle is the contact reference for motion transfer
 - ☐ B. Dedendum circle is the contact reference for motion transfer
 - ☐ C. Root circle is the contact reference for motion transfer
 - ☐ D. Addendum circle is the contact reference for motion transfer

Q.67 Which of the following is the main reason a pipe cut using a wheel pipe cutter must be deburred or reamed after cutting?

- Ans**
- ☐ A. The pipe cutter produces rough external threads on the pipe surface
 - ☐ B. The cutter removes excess metal chips inside the pipe during cutting
 - ☒ C. The cutting process leaves a ridge inside the pipe that may obstruct flow
 - ☐ D. The cutter wheel increases the internal diameter of the pipe after cutting

Q.68 Which change will decrease the electrical resistance of a metal wire in a workshop circuit?

- Ans**
- ☐ A. Lowering the voltage applied to the wire
 - ☐ B. Raising the temperature of the wire
 - ☐ C. Using a less conductive material for the wire
 - ☒ D. Increasing the thickness of the wire

Q.69 Cast iron is mainly used in bearings for:

- Ans**
- ☒ A. Light loads
 - ☐ B. Heavy loads
 - ☐ C. Shock loads
 - ☐ D. Impact loads

Q.70 Which of the following situations best demonstrates when a needle bearing is preferred over other types of bearings in an industrial setting?

- Ans**
- ☐ A. When vibration isolation is critical and misalignment may occur
 - ☒ B. When limited radial space is available and high load capacity is needed
 - ☐ C. When high-speed axial loads are present and minimal heat generation is needed
 - ☐ D. When large axial loads and self-alignment are required

Q.71 Which solder composition is most suitable for joining delicate electronic components requiring a low melting point and reliable electrical connections?

- Ans**
- ☐ A. Copper-based solder with 95% copper, 5% tin
 - ☒ B. Tin-lead solder with 60% tin and 40% lead
 - ☐ C. Lead solder with 70% lead and 30% tin
 - ☐ D. Silver solder with 2% silver, 97% tin, 1% copper

Q.72 What determines the final diameter of a hole after reaming?

- Ans**
- ☐ A. The hardness of the workpiece
 - ☐ B. The rotational speed of the lathe
 - ☒ C. The size of the reamer used
 - ☐ D. The type of the lubricant applied

Q.73 Which process is essential to ensure moisture is removed from compressed air before it enters pneumatic tools in a workshop environment?

- Ans**
- ☐ A. Passing air through a filter to trap solid contaminants
 - ☒ B. Using an air dryer to eliminate water vapor from compressed air
 - ☐ C. Allowing air to rest in a storage tank for moisture to settle
 - ☐ D. Cooling air in a closed chamber to reduce temperature

Q.74 What does the term 'centre of gravity' refer to in workshop calculations and science?

- Ans**
- ☐ A. It is the lowest point of the object
 - ☒ B. It is the point where the entire weight of an object acts
 - ☐ C. It is the point where the mass is maximum
 - ☐ D. It is the point where the object is fixed

Q.75 What does 'interchangeability' refer to in mechanical engineering?

- Ans**
- ☐ A. Ability to use any material for parts
 - ☐ B. Ability to change machine dimensions freely
 - ☒ C. Ability to replace parts without modification
 - ☐ D. Ability to assemble parts in any sequence