



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 Machinist

* 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 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 may contain infectious agents that pose health risks.
 - ☒ D. It is always radioactive and requires heavy shielding.

Q.2 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. 9
 - ☒ B. 18
 - ☒ C. 15
 - ☒ D. 12

Q.3 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. 7
 - ☒ B. 6
 - ☒ C. 9
 - ☒ D. 8

Q.4 Which of the following pairs of numbers is co-prime?

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

Q.5 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. Neither conclusion (I) nor (II) follows
 - ☒ B. Both conclusions (I) and (II) follow
 - ☒ C. Only conclusion (I) follows
 - ☒ D. Only conclusion (II) follows

Q.6 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. Load
 - ☒ B. Effort
 - ☒ C. Arm
 - ☒ D. Fulcrum

Q.7 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. 30%
 - ☒ B. 50%
 - ☒ C. 60%
 - ☒ D. 65%

Q.8 Which statement best describes the side view in engineering drawing?

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

Q.9 Which type of personal protective equipment is most suitable for tasks involving airborne chemical particles in confined spaces?

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

Q.10 What is a key feature of single stroke lettering in technical drawings?

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

Q.11 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. Both conclusions (I) and (II) follow.
 - ☐ B. Only conclusion (II) follows.
 - ☐ C. Neither conclusion (I) nor (II) follows.
 - ☒ D. Only conclusion (I) follows.

Q.12 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, Magnetic Storage
 - ☐ C. Compact Drive, Optical Storage
 - ☒ D. Compact Disc, Optical Storage

Q.13 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. FZ-GA
 - ☐ B. HB-IC
 - ☒ C. RL-SN
 - ☐ D. PJ-QK

Q.14 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 sister
 - ☐ C. Sister
 - ☒ D. Mother's mother

Q.15 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. 6.5%
 - ☐ B. $5\frac{1}{3}\%$
 - ☒ C. $4\frac{1}{6}\%$
 - ☐ D. 5%

Q.16 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. 185
 - ☐ C. 267
 - ☒ D. 252

Q.17 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. Substitute the normally closed push button symbol with a general switch symbol
 - ☐ B. Draw a hand made representation of the push button with a note explaining function
 - ☒ C. Use the standardized symbol for a normally closed push button as per conventions
 - ☐ D. Describe the normally closed push button in words within the schematic diagram clearly

Q.18 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. 45°
 - ☐ C. 55°
 - ☐ D. 60°

Q.19 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. REXZ
 - ☒ B. RDX Y
 - ☐ C. QDYY
 - ☐ D. QEYZ

Q.20 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.21 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. Decreasing the length of the wire
 - ☐ C. Reducing the current in the wire
 - ☐ D. Making the wire thicker

Q.22 A cyclist travels from the kilometer stone marked 52 to the stone marked 79. How far has the cyclist traveled?

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

Q.23 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. 4
 - ☒ B. 2
 - ☐ C. 7
 - ☐ D. 1

Q.24 What is the primary color used in warning signs to alert workers of potential hazards?

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

Q.25 Which scenario best demonstrates proactive workplace safety behavior?

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

Q.26 What is the primary role of the Central Processing Unit (CPU) in a computer system?

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

Q.27 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. TPQ 106
 - ☒ B. SPQ 106
 - ☐ C. TPQ 107
 - ☐ D. SPQ 107

Q.28 Which combination best describes the main environmental challenges associated with plastic waste management?

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

Q.29 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 I alone is sufficient to answer the question while data in statement II is not
 - ☐ B. Both statements I and II together (and not statement I alone or statement II alone) are sufficient to answer the question
 - ☐ C. Data in statement II alone is sufficient to answer the question while data in statement I is not
 - ☒ D. Both statements I and II together are NOT sufficient to answer the question

Q.30 Simplify the following expression.

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

- Ans**
- ☐ A. 44
 - ☒ B. 40
 - ☐ C. 48
 - ☐ D. 36

Q.31 Which statement best describes how the mass and speed of an object affect its kinetic energy?

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

Q.32 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. 10 cm
 - ☐ B. 40 cm
 - ☐ C. 20 cm
 - ☒ D. 30 cm

Q.33 If $x + \frac{1}{x} = 5$, then $\frac{x^3 - 5x^2 + 5x}{x^2 + 1}$ is equal to:

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

Q.34 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. 9 m
 - ☐ B. 15 m
 - ☐ C. 18 m
 - ☒ D. 12 m

Q.35 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. 12 – 34 – 41 – 50
 - ☐ B. 11 – 31 – 38 – 29
 - ☐ C. 8 – 22 – 15 – 24
 - ☐ D. 4 – 14 – 21 – 30

Q.36 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 200 meters; the displacement is 120 meters
 - ☐ B. The distance is 120 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.37 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. 2 degrees Celsius
 - ☐ B. 0.5 degrees Celsius
 - ☐ C. 10 degrees Celsius
 - ☒ D. 1 degree Celsius

Q.38 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. 67
 - ☐ B. 63
 - ☐ C. 69
 - ☒ D. 65

Q.39 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. Data in Statement I alone is sufficient to answer the question while data in statement II is not
 - ☐ C. Data in Statement II alone is sufficient to answer the question while data in statement I is not
 - ☐ D. Both statements I and II together (and not statement I alone or statement II alone) are sufficient to answer the question

Q.40 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. 19500 square meters
 - ☐ C. 1800 square meters
 - ☐ D. 15000 square meters

Q.41 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. 23 km/h
 - ☐ B. 21 km/h
 - ☒ C. 20 km/h
 - ☐ D. 27 km/h

Q.42 Which of the following is the best example of municipal solid waste?

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

Q.43 Which statement best describes the front view in an engineering drawing?

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

Q.44 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. 12,000
 - ☒ B. 14,000
 - ☒ C. 15,500
 - ☒ D. 7,500

Q.45 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. VZZ - BCD
 - ☒ B. ABD - VZZ
 - ☒ C. BOC - VZT
 - ☒ D. BCD - VZZ

Q.46 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. 5
 - ☒ B. 4
 - ☒ C. 6
 - ☒ D. 3

Q.47 Why does restricting certain chemical refrigerants effectively reduce damage to the ozone layer?

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

Q.48 Which of the following statements best describes a triangle as used in engineering drawing?

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

Q.49 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. 160
☒ B. 162
☒ C. 188
☒ D. 180

Q.50 What information does a kilometer stone provide to travelers on a road?

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

Q.51 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. C
☒ C. B
☒ D. A

Q.52 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 16 minutes
☒ B. 3 hours 26 minutes
☒ C. 3 hours 36 minutes
☒ D. 3 hours 6 minutes

Q.53 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 force required
☒ B. The mechanical advantage
☒ C. The work done in raising the box
☒ D. The distance moved along the ramp

Q.54 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.55 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. S
 - ☒ B. W
 - ☒ C. T
 - ☒ D. P

Q.56 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. A3 size sheet
 - ☒ B. A1 size sheet
 - ☒ C. A0 size sheet
 - ☒ D. A2 size sheet

Q.57 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. One
 - ☒ D. Three

Q.58 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 low melting point to break the circuit during excess current.
 - ☒ B. The fuse wire must have a high melting point for durability.
 - ☒ C. The fuse wire must have high resistance and be thick to prevent melting.
 - ☒ D. The fuse wire must have a shiny surface for efficient cooling.

Q.59 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. 1500 W
 - ☒ B. 3000 W
 - ☒ C. 1000 W
 - ☒ D. 2000 W

Q.60 If $3x - 2y + 3z = 8$, $4x - 3y + 2z = 4$ and $2x + y - z = 1$, then find x, y and z, respectively.

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

Q.61 What should come in place of the question mark (?) in the given series?

1 2 7 20 61 ?

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

Q.62 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. 13.81%
 - ☐ B. 10.36%
 - ☐ C. 15.12%
 - ☒ D. 12.64%

Q.63 Which one of the following statements correctly describes a characteristic of WANs?

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

Q.64 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. ₹80,000
 - ☐ B. ₹82,000
 - ☐ C. ₹78,000
 - ☐ D. ₹75,000

Q.65 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. FCBMT
 - ☐ B. TCMBF
 - ☐ C. FBMCT
 - ☒ D. TBMCF

Q.66 Find the compound interest on ₹5,70,000 for 1.5 years at 10% per annum compounded half-yearly.

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

Q.67 What is the primary purpose of a Local Area Network (LAN)?

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

Q.68 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. 1333
 - ☒ C. 1433
 - ☒ D. 1543

Q.69 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. U
 - ☒ B. T
 - ☒ C. V
 - ☒ D. X

Q.70 What does the term 'HAZOP' stand for in occupational safety?

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

Q.71 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. Father's brother's wife's sister
 - ☒ B. Father's brother's wife's mother
 - ☒ C. Mother's brother's wife's sister
 - ☒ D. Mother's brother's wife's mother

Q.72 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. 40 : 41
 - ☒ B. 31 : 50
 - ☒ C. 40 : 51
 - ☒ D. 51 : 42

Q.73 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. 8 hours
 - ☒ B. 9 hours
 - ☒ C. 7 hours
 - ☒ D. 6 hours

Q.74 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. 300 N, because the Moon's gravity is about one-half of Earth's.
 - ☒ B. 100 N, because the Moon's gravity is about one-sixth of Earth's.
 - ☒ C. 600 N, because a person's weight remains unchanged on the Moon.
 - ☒ D. 200 N, because the Moon's gravity is about one-third of Earth's.

Q.75 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. Carrying the same backpack horizontally for 2 meters
 - ☒ B. Lifting a heavier backpack to the same 2-meter ledge
 - ☒ C. Lifting a lighter backpack to the same 2-meter ledge
 - ☒ D. Lifting the same backpack to a 1-meter ledge

Q.76 Which intervention most effectively reduces ground-level pollutant concentrations during a winter temperature inversion?

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

Q.77 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. West
 - ☒ B. South
 - ☒ C. North
 - ☒ D. East

Q.78 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. Using the same reference line for all repeated angles
 - ☒ C. Marking all angles lightly with a pencil before finalizing
 - ☒ D. Drawing all angles continuously without intermediate verification

Q.79 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.80 What does CPU stand for in computing?

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

Q.81 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. 8.57 seconds
 - ☐ B. 8.43 seconds
 - ☐ C. 9.25 seconds
 - ☐ D. 7.57 seconds

Q.82 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. 28
 - ☒ B. 30
 - ☐ C. 35
 - ☐ D. 32

Q.83 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. The rib is sectioned but the hole is left unsectioned
 - ☐ C. Both the hole and the rib are shown unsectioned
 - ☐ D. Both the hole and the rib are shown sectioned

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

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

Q.85 Which symbol best represents a battery in an electric circuit diagram according to standard conventions?

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

Q.86 Why is a room thermometer generally mounted vertically on a wall?

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

Q.87 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. None
 - ☒ B. One
 - ☐ C. Two
 - ☐ D. Three

Q.88 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 third shopkeeper
 - ☒ C. Buy from the second shopkeeper
 - ☒ D. Buy from the first shopkeeper

Q.89 Why are electric wires in household appliances usually covered with plastic or rubber coating?

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

Q.90 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. 150 meters
 - ☒ C. 10 meters
 - ☒ D. 60 meters

Q.91 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. C
 - ☒ B. D
 - ☒ C. A
 - ☒ D. Y

Q.92 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. DG – EH
 - ☒ B. SJ – TK
 - ☒ C. KE – LF
 - ☒ D. IT – KV

Q.93 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
 - ☒ B. 10.5
 - ☒ C. 11.5
 - ☒ D. 10

Q.94 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 displays the current speed at which the vehicle is moving.
 - ☐ C. It shows the rate at which the vehicle's speed changes.
 - ☐ D. It measures the total distance the vehicle has traveled.

Q.95 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. Total displacement divided by total time taken
 - ☐ B. Change in velocity divided by total time taken
 - ☐ C. Distance travelled in a particular direction divided by time
 - ☒ D. Total distance travelled divided by the total time taken

Q.96 Which of the following statements best describes a cuboid as used in engineering drawing?

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

Q.97 Which tool safety measure best prevents injuries when cleaning a workshop lathe after use?

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

Q.98 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. ₹288.24
 - ☐ B. ₹296.46
 - ☒ C. ₹291.18
 - ☐ D. ₹284.45

Q.99 If the height of an object is doubled while its mass remains constant, its gravitational potential energy will be:

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

Q.100 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. 336
 - ☒ B. 357
 - ☐ C. 378
 - ☐ D. 350

Q.1 A 1:40 taper is to be turned using the compound rest. If the workpiece is 200 mm long, what is the approximate compound rest angle required?

- Ans**
- ☐ A. 1.15 degrees
 - ☐ B. 0.36 degrees
 - ☒ C. 0.72 degrees
 - ☐ D. 1.43 degrees

Q.2 After resolving an axis over-travel on a CNC lathe, which action should be performed before resuming the program?

- Ans**
- ☐ A. Change the workpiece and start a new setup
 - ☐ B. Ignore the zero return process and continue machining
 - ☐ C. Restart the program immediately from where it stopped
 - ☒ D. Verify axis position and reference zero return if needed

Q.3 In a puncher type slotter, what is the primary movement of the cutting tool?

- Ans**
- ☐ A. Rotating horizontally
 - ☐ B. Moving diagonally
 - ☐ C. Oscillating in circles
 - ☒ D. Reciprocating vertically

Q.4 A trainee accidentally activates the automatic tool changer while a hand is near the turret. What is the safest immediate action using panel controls?

- Ans**
- ☐ A. Press the cycle pause button to hold program execution
 - ☒ B. Activate the emergency stop to instantly cut machine movement
 - ☐ C. Decrease the axis movement speed using the override dial
 - ☐ D. Switch to manual mode on the panel controls

Q.5 Which method of cylindrical grinding is used when the workpiece is supported between centers and rotated?

- Ans**
- ☐ A. Infeed center-less method
 - ☐ B. End feed grinding method
 - ☐ C. Through feed grinding method
 - ☒ D. Traverse grinding method

Q.6 When a taper turning attachment is used instead of swiveling the compound rest, what machining capability is significantly enhanced?

- Ans**
- ☐ A. It reduces the hardness of the workpiece material
 - ☐ B. It allows for cutting threads on the workpiece
 - ☒ C. It enables the production of long tapers accurately
 - ☐ D. It makes the tool holder lighter for easier handling

Q.7 Which grade of pencil is recommended for single-stroke lettering in engineering drawings?

- Ans**
- ☐ A. B grade
 - ☐ B. F grade
 - ☒ C. HB grade
 - ☐ D. 2H grade

Q.8 Which material is least likely to be affected by rapid temperature changes during cutting?

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

Q.9 The main factor influencing a lathe's firmness under load is:

- Ans**
- ☒ A. Bed width and design
 - ☒ B. Spindle bore diameter
 - ☒ C. Swing over bed
 - ☒ D. Spindle speed range

Q.10 What is the main function of the spindle in a bench vice?

- Ans**
- ☒ A. To increase friction on the workpiece
 - ☒ B. To support the base
 - ☒ C. To protect the jaws
 - ☒ D. To convert rotary motion into linear motion

Q.11 When setting up for a heavy milling operation, why is it important to ensure that the overarm and ram are securely locked in position?

- Ans**
- ☒ A. Extends table travel distance
 - ☒ B. Increases spindle rotation speed
 - ☒ C. Improves coolant flow rate
 - ☒ D. Prevents unwanted movement during cutting

Q.12 Which type of drilling machines is specifically designed to accommodate multiple spindles so that different drilling operations can be performed at the same time?

- Ans**
- ☒ A. Bench drilling machine
 - ☒ B. Gang drilling machine
 - ☒ C. Upright drilling machine
 - ☒ D. Radial drilling machine

Q.13 A production line experiences repeated delays due to waiting for maintenance staff to fix machines. As a machinist, what process change would best minimize down time in this scenario?

- Ans**
- ☒ A. Extending machine warranty agreements for repairs
 - ☒ B. Rescheduling shifts to match maintenance staff availability
 - ☒ C. Increasing the number of maintenance staff on call
 - ☒ D. Training operators to perform routine maintenance tasks

Q.14 In a milling operation, the actual cycle time is consistently higher than the estimated cycle time. Which factor is most likely causing this discrepancy if all other parameters remain constant?

- Ans**
- ☒ A. Machine speed is always constant
 - ☒ B. Frequent tool changes are causing delays
 - ☒ C. Operator skill is unchanged
 - ☒ D. Material properties remain the same during operation

Q.15 What does the term 'machine hour rate' refer to in costing?

- Ans**
- ☐ A. The total machine-related cost allocated for one year
 - ☐ B. The total operating profit earned per machine day
 - ☒ C. The factory overhead cost incurred per machine hour
 - ☐ D. The total machine-generated revenue earned per shift

Q.16 In a scenario where a CNC vertical machining center is required to maintain extremely tight tolerances over an extended production run, which closed-loop control component is directly responsible for identifying and reporting deviations from the programmed tool path?

- Ans**
- ☐ A. Spindle motor drive
 - ☐ B. Power supply module
 - ☒ C. Position feedback transducer
 - ☐ D. Coolant distribution unit

Q.17 A machinist is required to finish a hole in a hard alloy component. Which reamer material should be selected?

- Ans**
- ☐ A. Copper
 - ☐ B. Mild Steel
 - ☐ C. Brass
 - ☒ D. Carbide

Q.18 Which property of the coolant fluid is most critical to ensure both effective cooling and lubrication during vertical milling operations?

- Ans**
- ☐ A. The coolant must have high electrical conductivity for machine safety.
 - ☐ B. The coolant must be brightly colored for easy visibility while machining.
 - ☐ C. The coolant must be able to produce foam to protect the workpiece from chips.
 - ☒ D. The coolant must have suitable viscosity and thermal conductivity for machining.

Q.19 When changing from a shorter to a longer tool on a CNC lathe, which adjustment must be made to maintain machining accuracy?

- Ans**
- ☐ A. Adjust the spindle feed rate
 - ☒ B. Update the tool length offset value
 - ☐ C. Update the work table offset value
 - ☐ D. Select a different part program

Q.20 When does a parallelogram become a rectangle?

- Ans**
- ☒ A. When all four internal angles become right angles.
 - ☐ B. When all four boundary sides become unequal in length.
 - ☐ C. When the two adjacent sides become equal in length.
 - ☐ D. When the two diagonal lines become perpendicular.

Q.21 Which part of the lathe is mounted on the left end of the bed?

- Ans**
- ☐ A. Tool post
 - ☐ B. Tailstock
 - ☒ C. Headstock
 - ☐ D. Carriage

Q.22 Why is a feedback device such as an encoder important in the closed-loop control of CNC VMC machines?

- Ans**
- ☐ A. It operates independently without any feedback from the machine to adjust its speed.
 - ☐ B. It sets the initial speed of the spindle but does not monitor its position.
 - ☒ C. It allows the controller to correct errors in tool movement during machining.
 - ☐ D. It displays the position information on the screen for the operator for information.

Q.23 A machinist is experiencing periodic marks on the surface of a workpiece during cylindrical grinding. After checking for machine looseness and wheel balance, which adjustment should be prioritized to eliminate chatter if the marks persist?

- Ans**
- ☒ A. Increase the rigidity of the workpiece support
 - ☐ B. Decrease the feed rate of the grinding wheel
 - ☐ C. Switch to a softer grade grinding wheel
 - ☐ D. Increase the grinding wheel speed

Q.24 Which operation would most benefit from using a half round file over a square file?

- Ans**
- ☐ A. Shaping a hexagonal hole
 - ☐ B. Leveling a flat surface
 - ☒ C. Blending a curved groove
 - ☐ D. Making a sharp corner

Q.25 When producing a plate cam, why is it necessary to use a template or pattern during manufacturing?

- Ans**
- ☐ A. It increases the hardness of the material used in cam manufacturing
 - ☒ B. It ensures the cam profile is accurately reproduced to the required profile
 - ☐ C. It ensures that the heat treatment process does not lead to warping
 - ☐ D. It speeds up the process and ensures the correct setup for milling

Q.26 During preventive maintenance, unusual wear is observed on the gripping arms of the ATC in a CNC VMC. Which operational issue is most likely to occur if this wear is not addressed promptly?

- Ans**
- ☐ A. Incorrect spindle speed may be selected during tool change
 - ☐ B. Coolant may not be delivered during tool changes
 - ☒ C. Tools may be dropped or not securely loaded into the spindle
 - ☐ D. ATC may not recognize the correct tool number

Q.27 During CNC VMC milling, an operator must program the machine to activate coolant flow before starting the spindle for a heat-sensitive operation. Which ISO M code should be programmed before spindle start to ensure coolant is delivered to the cutting zone?

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

Q.28 A machinist wants to divide a workpiece into 8 equal parts using direct indexing. How many holes should be moved between each division on a 24-hole plate?

- Ans**
- ☐ A. Move 6 holes each time
 - ☐ B. Move 4 holes each time
 - ☐ C. Move 2 holes each time
 - ☒ D. Move 3 holes each time

Q.29 How does natural deterioration of component affect production?

- Ans**
- ☐ A. It improves production speed and operating efficiency
 - ☐ B. It eliminates maintenance requirements for equipment
 - ☒ C. It leads to more production interruptions and stoppages
 - ☐ D. It reduces equipment downtime during production activities

Q.30 Which lighting is commonly used in workshops for safe movement during a power failure?

- Ans**
- ☐ A. Task lighting
 - ☐ B. Decorative lighting
 - ☐ C. Ambient lighting
 - ☒ D. Emergency lighting

Q.31 If the volume of a cube is 3375 cm³, what is the length of one side?

- Ans**
- ☐ A. 18 cm
 - ☐ B. 20 cm
 - ☐ C. 12 cm
 - ☒ D. 15 cm

Q.32 If a bench vice shows uneven clamping pressure, which maintenance step should be performed first?

- Ans**
- ☐ A. Increase the lubrication amount
 - ☐ B. Reduce the handle length
 - ☐ C. Replace the entire vice
 - ☒ D. Check jaw alignment and tighten mounting bolts

Q.33 A machine with a power rating of 2 kW operates continuously for 5 hours. What is the total electrical energy consumed by the machine during this period?

- Ans**
- ☐ A. 7 kWh
 - ☐ B. 2.5 kWh
 - ☐ C. 0.4 kWh
 - ☒ D. 10 kWh

Q.34 In a CNC turning center, the operator finds that sharp corners in the programmed part are automatically blended with a small radius. Which tool compensation setting should be checked to restore sharp corners?

- Ans**
- ☐ A. Coolant pressure adjustment during cutting
 - ☒ B. Tool radius offset value for the current tool
 - ☐ C. Spindle power setting during finishing
 - ☐ D. Tool change position in the turret

Q.35 A student claims that a V-block can be used for holding flat jobs as effectively as round jobs. Why is this statement incorrect?

- Ans**
- ☐ A. Flat jobs are too heavy
 - ☒ B. Flat jobs lack surface contact in the V-block
 - ☐ C. V-blocks are only made for large jobs
 - ☐ D. V-blocks damage flat jobs

Q.36 A machinist observes that the spindle motor of a CNC lathe is overheating after prolonged use. Which aspect of the spindle drive system should be primarily checked to address this issue?

- Ans**
- ☐ A. Lubrication system condition
 - ☐ B. Electrical wiring insulation
 - ☐ C. Drive belt alignment
 - ☒ D. Cooling mechanism efficiency

Q.37 If a machinist must grind a non-ferrous metal, which grinding wheel would be most appropriate to use?

- Ans**
- ☐ A. Diamond wheel is used for non-ferrous metals
 - ☐ B. Cubic boron nitride wheel is best for non-ferrous metals
 - ☒ C. Silicon carbide wheel is suitable for non-ferrous metals
 - ☐ D. Aluminum oxide wheel is ideal for non-ferrous metals

Q.38 Which part(s) of the milling cutter is/are primarily used for cutting in face milling operations?

- Ans**
- ☐ A. Machine spindle body
 - ☒ B. Cutter face edges
 - ☐ C. Cutter side edges
 - ☐ D. Arbor shaft face

Q.39 During a milling operation, what aspect of the spindle ensures accurate machining and surface finish on the workpiece?

- Ans**
- ☐ A. Increasing spindle speed beyond recommended levels
 - ☐ B. Using a heavy-duty spindle for large cutters
 - ☒ C. Proper alignment and minimal runout of the spindle
 - ☐ D. Only using lubricated spindle bearings

Q.40 Which PPE is appropriate for protecting against electrical hazards in a workshop?

- Ans**
- ☐ A. Cotton gloves
 - ☐ B. Leather gloves
 - ☐ C. Latex gloves
 - ☒ D. Insulated gloves

Q.41 Which type of encoders is most commonly used in CNC VMC machines for precise position measurement?

- Ans**
- ☐ A. Linear encoder
 - ☒ B. Rotary encoder
 - ☐ C. Limit switch
 - ☐ D. Optical sensor

Q.42 A mechanic observes rust spots on a file despite storage. What maintenance step was likely skipped?

- Ans**
- ☒ A. Application of light oil before storage
 - ☐ B. Sharpening the file teeth
 - ☐ C. Polishing with emery cloth
 - ☐ D. Use of a plastic handle

Q.43 In the tailstock offset method for taper turning, what is the primary function of the tailstock?

- Ans**
- ☐ A. To support threading operations
 - ☐ B. To adjust spindle speed during operation
 - ☐ C. To set tool feed direction
 - ☒ D. To set the alignment for creating a taper

Q.44 Where must the title block be located on an engineering drawing sheet according to the prescribed standard?

- Ans**
- ☒ A. Bottom right-hand corner
 - ☐ B. Top left-hand corner
 - ☐ C. Top right-hand corner
 - ☐ D. Bottom left-hand corner

Q.45 Which of the following is NOT usually a cause of machine downtime?

- Ans**
- ☐ A. Scheduled maintenance
 - ☒ B. Continuous production run
 - ☐ C. Power supply interruption
 - ☐ D. Equipment failure

Q.46 Which part of a cylindrical grinder holds and rotates the workpiece during the grinding operation?

- Ans**
- ☐ A. Tailstock
 - ☒ B. Headstock
 - ☐ C. Carriage
 - ☐ D. Grinding wheel

Q.47 Which unsafe practice can lead to electrical accidents in a workshop?

- Ans**
- ☐ A. Checking voltage before equipment use
 - ☒ B. Bypassing safety interlocks on machines
 - ☐ C. Using dry hands when operating switches
 - ☐ D. Wearing safety shoes during work

Q.48 When using the reciprocating table method, what is the primary movement of the surface grinder table relative to the grinding wheel?

- Ans**
- ☒ A. Back-and-forth linear motion
 - ☐ B. Side-to-side linear motion
 - ☐ C. Up-and-down vertical motion
 - ☐ D. Rotary circular motion

Q.49 Which application is best suited for carbide drills?

- Ans**
- ☒ A. High-speed machining of tough materials
 - ☐ B. Drilling wood objects only
 - ☐ C. Manual metal bending
 - ☐ D. Finishing internal surfaces of plastic materials

Q.50 Which scenario requires the use of multiple auxiliary views in orthographic projection?

- Ans**
- ☐ A. A rectangular block with entirely flat and straight faces.
 - ☒ B. A part with several surfaces inclined at different angles.
 - ☐ C. An object with all surfaces parallel to principal planes.
 - ☐ D. A cylinder with its axis perpendicular to all planes.

Q.51 Which statement correctly explains the purpose of setting a work offset in CNC VMC programming?

- Ans**
- ☐ A. A work offset modifies the tool length during program setup in CNC VMC for accurate machining.
 - ☐ B. A work offset changes the home position of the CNC machine for each tool used for accurate machining.
 - ☒ C. A work offset establishes the relationship between the machine zero and the part zero for accurate machining.
 - ☐ D. A work offset is used exclusively during tool change operations in CNC VMC for accurate machining.

Q.52 Which tool is most commonly used for cutting keyways on a slotting machine?

- Ans**
- ☐ A. Formed tool type
 - ☒ B. Single point tool
 - ☐ C. Round nose tool
 - ☐ D. Diamond point tool

Q.53 During a cylindrical grinding operation, an operator observes closely spaced, repetitive marks on the surface of the workpiece. Which of the following is most likely responsible for the formation of these chatter marks?

- Ans**
- ☐ A. Excessive coolant flow on the wheel
 - ☒ B. Loose spindle bearings causing vibration
 - ☐ C. Wheel loading resulting in glazing
 - ☐ D. Incorrect work speed causing burns

Q.54 While operating a CNC lathe, an unexpected tool movement causes the tool to contact the chuck. What type of machine damage is most likely to occur from this collision?

- Ans**
- ☐ A. Coolant leakage
 - ☐ B. Bed misalignment
 - ☐ C. Spindle bearing failure
 - ☒ D. Chuck jaw deformation

Q.55 How much is 1 calorie in joules?

- Ans**
- ☐ A. 2.500 joules
 - ☐ B. 1.000 joules
 - ☐ C. 10.000 joules
 - ☒ D. 4.186 joules

Q.56 If a flash fire occurs during hot work, what should be the worker's IMMEDIATE response?

- Ans**
- ☐ A. Trying to hide the incident temporarily to avoid interrupting ongoing workshop operations
 - ☒ B. Activating the nearest fire alarm and evacuating the area according to emergency procedures
 - ☐ C. Completing the current hot work activity before taking action against the fire emergency
 - ☐ D. Attempting to extinguish the flash fire alone before informing nearby workers or supervisors

Q.57 A steel plate has a mass of 8.516 kg. If its volume is 1089 cm³, what is the density in gm/cm³?

- Ans**
- ☐ A. 8.50
 - ☐ B. 8.00
 - ☒ C. 7.82
 - ☐ D. 7.25

Q.58 If the contact surfaces of a V-block become worn, the most appropriate action is to:

- Ans**
- ☐ A. Ignore the wear
 - ☐ B. Increase clamping force
 - ☐ C. Paint the surface
 - ☒ D. Replace or recondition the V-block

Q.59 Which of the following is a multipoint cutting tool?

- Ans**
- ☐ A. Parting tool
 - ☒ B. Milling cutter
 - ☐ C. Boring bar
 - ☐ D. Lathe tool

Q.60 Why should regular inspections be performed on equipment?

- Ans**
- ☐ A. To reduce maintenance records and documentation efforts
 - ☒ B. To identify potential problems before major failures occur
 - ☐ C. To increase machine output and production efficiency
 - ☐ D. To complete routine inspection checklists within schedule

Q.61 Tools are required to resist wear and function reliably during repetitive operations. Which property is most commonly enhanced through heat treatment to fulfill this requirement?

- Ans**
- ☐ A. Toughness
 - ☐ B. Machinability
 - ☒ C. Wear resistance
 - ☐ D. Elasticity

Q.62 When interpreting a job drawing, how can you distinguish a split pin from a solid pin based on conventional representation?

- Ans**
- ☒ A. A split pin shows two legs with a visible gap
 - ☐ B. A split pin appears as a circle with center dot
 - ☐ C. A split pin uses zigzag lines for representation
 - ☐ D. A split pin uses crossing lines in the drawing

Q.63 Which fluid is typically used to improve aluminum machining on a lathe machine?

- Ans**
- ☒ A. Soluble oil-based coolant
 - ☐ B. Kerosene without additives
 - ☐ C. Synthetic cutting fluid
 - ☐ D. Pure water as a coolant

Q.64 How does the pitch (number of teeth per inch) of a hacksaw blade affect its cutting ability?

- Ans**
- ☒ A. Finer pitch produces smoother cuts
 - ☐ B. Pitch only affects heat generation during cutting
 - ☐ C. Pitch material only affects blade lifespan
 - ☐ D. Coarser pitch is better for all materials

Q.65 Why does BIS tolerance notation specify hole designation before shaft designation in fits?

- Ans**
- ☐ A. To specify the tolerance magnitude of shaft before hole
 - ☐ B. To identify the inspection sequence during measurement
 - ☐ C. To represent the actual size obtained after machining
 - ☒ D. To indicate the hole basis or shaft basis relationship used for the fit

Q.66 In an open-loop CNC control system, what happens if there is a load disturbance during machining?

- Ans**
- ☐ A. The system slows down to adjust the error
 - ☐ B. The system automatically compensates the disturbance
 - ☒ C. The system cannot detect or correct the error
 - ☐ D. The system sends an alarm to the operator to stop

Q.67 A machinist wants to create a gear with 20 teeth using simple indexing. Which setting should be used on a standard 40:1 dividing head?

- Ans**
- ☐ A. Ten full rotations
 - ☐ B. Five full rotations
 - ☒ C. Two full rotations
 - ☐ D. Four full rotations

Q.68 While operating a CNC lathe, an unexpected tool movement causes the tool to contact the chuck. Which type of machine damage is most likely to occur from this collision?

- Ans**
- ☐ A. CNC controller software errors
 - ☒ B. Turret misalignment or damage
 - ☐ C. Unstable spindle speed during cycles
 - ☐ D. Tool magazine jamming during tool change

Q.69 Given a 10 mm twist drill and a recommended feed of 0.15 mm/rev, what is the total feed after 20 revolutions?

- Ans**
- ☐ A. 0.75 millimeters
 - ☒ B. 3.00 millimeters
 - ☐ C. 2.00 millimeters
 - ☐ D. 1.50 millimeters

Q.70 Which term refers to the number of teeth per inch on a file?

- Ans**
- ☐ A. Shape
 - ☐ B. Length
 - ☒ C. Cut
 - ☐ D. Pitch

Q.71 A heat treatment process is required to maximize the shock resistance of a tool used for impact operations. Which process should be applied to achieve the required property enhancement?

- Ans**
- ☒ A. Tempering after quenching
 - ☐ B. Quenching without tempering
 - ☐ C. Normalizing to refine grain structure
 - ☐ D. Full annealing at high temperature

Q.72 A machinist selects tempering as the next step after hardening a steel component. Which property is most likely to improve as a result of tempering in this heat treatment process?

- Ans**
- ☐ A. Hardness increases with reduced ductility
 - ☐ B. Grain size increases with no change in ductility
 - ☒ C. Toughness increases while brittleness decreases
 - ☐ D. Strength decreases with finer grain structure

Q.73 During a straddle milling operation, chatter marks are observed on both parallel surfaces after machining. Which adjustment would most likely reduce this defect?

- Ans**
- ☐ A. Increasing the table feed significantly
 - ☐ B. Using a coarser feed rate
 - ☐ C. Raising the spindle speed substantially
 - ☒ D. Reducing the cutter overhang on the arbor

Q.74 Why should a reamer never be rotated backwards during removal from a hole?

- Ans**
- ☐ A. It prevents chip removal
 - ☐ B. It reduces tool temperature
 - ☐ C. It will improve the surface finish
 - ☒ D. It damages the cutting edges and accuracy

Q.75 Which feature distinguishes a helix from a simple spiral?

- Ans**
- ☐ A. A helix and a spiral both lie in a single plane but differ in size.
 - ☐ B. A helix forms a closed loop, while a spiral always remains open-ended.
 - ☒ C. A helix extends in three dimensions around an axis, while a spiral lies flat in one plane.
 - ☐ D. A helix always starts at a single point, while a spiral does not.