



Test Center Name

रेल भर्ती बोर्ड / RAILWAY RECRUITMENT BOARDS

सी ई एन आर आर बी - ०२/२०२४ - CEN RRB - 02/2024



Narayanam Info Online

# RRB TECHNICIAN GRADE I 2024

Technician Grade I Signal | CEN RRB 02/2024

## ENGLISH ANSWER KEY

### Official Answer Key with Solutions

All 4 Shifts · 19-12-2024 to 20-12-2024

|           |                                                   |
|-----------|---------------------------------------------------|
| Questions | 100                                               |
| Marking   | +1 correct / -1/3 wrong                           |
| Duration  | 90 minutes                                        |
| Sections  | General Awareness · Maths · Reasoning · Technical |

Every paper here is the official RRB response sheet with the correct answer marked.

#### HOW TO USE THIS BOOK

- 1 Open the INDEX on the next page.
- 2 Click any row to jump straight to that date and shift.
- 3 Correct options are ticked in green, wrong ones crossed in red.
- 4 Use the bookmarks panel of your PDF reader to move between shifts.

Check your marks, normalized score and zone-wise rank free at  
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## Blackbook

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Compiled 12 September 2026

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RRB Technician Grade I 2024 (English) · 4 shifts

| DAY   | DATE                       | SHIFT   | TIME          | PAGE               |
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| Day 1 | <a href="#">19-12-2024</a> | Shift 1 | 09:00 - 10:30 | <a href="#">3</a>  |
| Day 1 | <a href="#">19-12-2024</a> | Shift 2 | 12:45 - 14:15 | <a href="#">19</a> |
| Day 1 | <a href="#">19-12-2024</a> | Shift 3 | 16:30 - 18:00 | <a href="#">36</a> |
| Day 2 | <a href="#">20-12-2024</a> | Shift 1 | 09:00 - 10:30 | <a href="#">54</a> |



# रेल भर्ती बोर्ड / RAILWAY RECRUITMENT BOARDS

सी ई एन आर आर बी - ०२/२०२४ - CEN RRB - 02/2024



|                  |                         |
|------------------|-------------------------|
| Test Center Name | Narayanam Info Online   |
| Test Date        | 19/12/2024              |
| Test Time        | 9:00 AM - 10:30 AM      |
| Subject          | RRB Technicians Grade I |

**\* 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 : RRB Technicians Grade I

**Q.1 Who has been honoured with the Goldman Environmental Prize 2024?**

- Ans**
- ☒ 1. Alok Shukla
  - ☐ 2. Jadav Payeng
  - ☐ 3. Maneka Gandhi
  - ☐ 4. Medha Patkar

**Q.2 Which menu option allows you to change the height and width of cells in MS-Excel?**

- Ans**
- ☐ 1. Review
  - ☒ 2. Format
  - ☐ 3. Insert
  - ☐ 4. Page Layout

**Q.3 Match the word templates from group A with their types in group B.**

Group A Group B

I. Planners and trackers A. Questionnaire

II. Marketing assets B. Flyers

III. Surveys C. Planning sheets

- Ans**
- ☐ 1. I-A, II-C, III-B
  - ☐ 2. I-A, II-B, III-C
  - ☒ 3. I-C, II-B, III-A
  - ☐ 4. I-B, II-C, III-A

**Q.4 What should come in place of the question mark (?) in the given series?**

901 903 ? 913 921 931

- Ans**
- ☐ 1. 906
  - ☒ 2. 907
  - ☐ 3. 905
  - ☐ 4. 909

**Q.5 The distance of the point P(2, 3) from the x-axis is**

- Ans**
- ☐ 1. 5
  - ☐ 2. 1
  - ☒ 3. 3
  - ☐ 4. 2

**Q.6** How can a user define cell address in an MS Excel sheet?

- Ans**
- ☐ 1. Column letter plus row letter
  - ☐ 2. Column number plus row number
  - ☐ 3. Column number plus row letter
  - ☒ 4. Column letter plus row number

**Q.7** What is the role of chemically inactive gases in a light bulb?

- Ans**
- ☒ 1. To prolong the life of the filament
  - ☐ 2. To increase the filament's temperature
  - ☐ 3. To cool the filament
  - ☐ 4. To reduce the bulb's light output

**Q.8** Which Article of the Indian Constitution provides that the state shall take steps, to secure the participation of workers in the management of industry?

- Ans**
- ☐ 1. Article 45B
  - ☒ 2. Article 43A
  - ☐ 3. Article 44C
  - ☐ 4. Article 42A

**Q.9** In the following number-pairs, the second number is obtained by applying certain mathematical operations to the first number. Which numbers should replace X and Y so that the pattern followed by the two numbers on the left side of :: is same as that on the right side of ::?

(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 to 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed.)

X : 16.2 :: 23 : Y

- Ans**
- ☐ 1. X=17, Y=21.2
  - ☐ 2. X=19, Y=22.2
  - ☐ 3. X=19, Y=21.2
  - ☒ 4. X=17, Y=22.2

**Q.10** The odds against an event is 7 : 4 and the odds in favour of another event is 8 : 5. If both the events are independent, then the probability that at least one of the event will happen is:

- Ans**
- ☒ 1.  $\frac{108}{143}$
  - ☐ 2.  $\frac{88}{143}$
  - ☐ 3.  $\frac{76}{143}$
  - ☐ 4.  $\frac{35}{143}$

**Q.11** Which of the following statements about the accuracy or precision of electronic instruments is correct?

- Ans**
- ☐ 1. The accuracy of the measurement is getting the same value for respective measurements.
  - ☒ 2. The precision is the degree to which the repeated measurement gives the same result.
  - ☐ 3. The accuracy and precision are the degree to which the measurement gives the same value.
  - ☐ 4. The precision is the degree to which the repeated measurement gives quoted value.

Q.12 Evaluate:  $\frac{1}{\left(\frac{5}{6}\right) + \left(\frac{2}{4}\right)} \div \frac{4}{29}$

Ans

☐ 1.  $5\frac{1}{2}$

☐ 2.  $5\frac{5}{16}$

☒ 3.  $5\frac{7}{16}$

☐ 4.  $5\frac{9}{16}$

Q.13 When dividing 0.00456 by 0.12, how many significant figures should the result be reported with?

Ans

☒ 1. 2

☐ 2. 4

☐ 3. 3

☐ 4. 1

Q.14 If  $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$ , and  $B = \{2, 4, 6, 8\}$ , then the number of elements in the set  $B'$  is:

Ans

☐ 1. 8

☒ 2. 5

☐ 3. 4

☐ 4. 9

Q.15 The mean and the standard deviation of 25 observations were given as 42 and 5, respectively. Later it was found that one of the observations was incorrectly entered as 10, when its correct value was 210. What would have been the correct standard deviation?

Ans

☐ 1.  $\sqrt{1048}$

☐ 2.  $\sqrt{1050}$

☐ 3.  $\sqrt{1047}$

☒ 4.  $\sqrt{1049}$

Q.16 A voltmeter has a uniform scale with 100 divisions; the full-scale reading is 300 V and 1/10 of a scale division can be estimated with a fair degree of certainty. Determine the resolution of the instrument in volt.

Ans

☐ 1. 0.1 V

☒ 2. 0.3 V

☐ 3. 0.5 V

☐ 4. 0.2 V

Q.17  $\triangle ABC$  is such that  $AB = 5$  cm,  $BC = 4$  cm and  $CA = 4.5$  cm.  $\triangle XYZ$  is similar to  $\triangle ABC$ . If  $YZ = 8$  cm, then find the perimeter of  $\triangle XYZ$ .

Ans

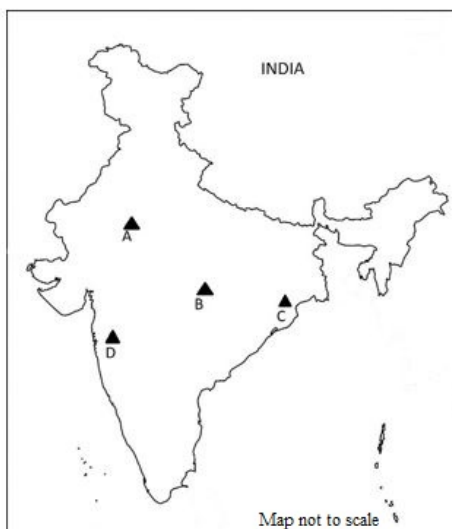
☒ 1. 27 cm

☐ 2. 26 cm

☐ 3. 25 cm

☐ 4. 28 cm

Q.18 In the given map, the location of the Simlipal National Park is shown at:



Ans ☒ 1. C

☐ 2. D

☐ 3. B

☐ 4. A

Q.19 The quality factor Q of a series RLC circuit at resonance is a measure of the \_\_\_\_\_.

Ans ☐ 1. resonance frequency

☐ 2. energy stored in the circuit

☐ 3. total impedance of the circuit

☒ 4. rate of energy loss relative to energy stored

Q.20 If  $\frac{18 \cos \theta + 5 \sin \theta}{5 \cos \theta + 4 \sin \theta} = 2$ , then find the value of  $\cot \theta$ .

Ans ☐ 1.  $\frac{1}{3}$

☐ 2.  $\frac{3}{5}$

☒ 3.  $\frac{3}{8}$

☐ 4.  $\frac{1}{7}$

Q.21 What is the purpose of the 'Sleep' option in the Windows OS?

Ans ☐ 1. To shut down the system

☒ 2. To save all open documents and programs while reducing power consumption

☐ 3. To delete temporary files

☐ 4. To restart the system

Q.22 Read the given statement and conclusions carefully and decide which of the given conclusions follow(s) from the statement.

Statement:

Book-reading is a very healthy habit because it keeps our learning process alive even after our college or school education.

Conclusions:

I. Nowadays, e-books are gaining far more popularity than hardcovers.

II. Students gain a lot of knowledge and improve language by keeping the habit of book-reading alive.

Ans ☐ 1. Only conclusion I follows

☐ 2. Both the conclusions follow

☐ 3. Neither conclusion I nor II follows

☒ 4. Only conclusion II follows

**Q.23** If 16th and 20th terms of an A.P. be 385 and 441 respectively, then its 90th term is:

- Ans**
- ☒ 1. 1421
  - ☐ 2. 1419
  - ☐ 3. 1420
  - ☐ 4. 1423

**Q.24** The most common topologies used in LAN networks are \_\_\_\_\_.

- Ans**
- ☐ 1. mesh and ring only
  - ☐ 2. insider threats, LAN sockets, viruses and malware
  - ☐ 3. wired, wireless, and virtual
  - ☒ 4. bus, ring, and star

**Q.25** Which feature is commonly found in modern anti-virus software to help with real-time threat detection?

- Ans**
- ☐ 1. Manual updates
  - ☒ 2. Cloud-based detection
  - ☐ 3. Offline scanning
  - ☐ 4. Passive scanning

**Q.26** Select the set in which the numbers are related in the same way as are the numbers of the following sets.  
(NOTE: Operations should be performed on the whole numbers, without breaking down the numbers into its constituent digits. E.g., 13 - Operations on 13 such as adding/deleting/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)  
(5, 9, 52)  
(11, 7, 90)

- Ans**
- ☒ 1. (9, 6, 65)
  - ☐ 2. (8, 11, 95)
  - ☐ 3. (14, 4, 63)
  - ☐ 4. (7, 13, 98)

**Q.27** Based on the English alphabetical order, three of the following four letter-clusters are alike in a certain way and thus form a group. Which letter-cluster 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**
- ☒ 1. EIRV
  - ☐ 2. AELR
  - ☐ 3. XBIO
  - ☐ 4. KOVB

**Q.28** Convert binary number 1101.1101 into decimal equivalent.

- Ans**
- ☒ 1. 13.8125
  - ☐ 2. 12.8125
  - ☐ 3. 13.625
  - ☐ 4. 12.625

**Q.29** In a certain code language,  
'R + S' means 'R is the mother of S',  
'R @ S' means 'R is the husband of S',  
'R # S' means 'R is the sister of S' and  
'R % S' means 'R is the father of S'.  
How is N related to P if 'M # N + O % P @ Q # T'?

- Ans**
- ☒ 1. Father's mother
  - ☐ 2. Father's sister
  - ☐ 3. Mother
  - ☐ 4. Sister

**Q.30** Select the most appropriate option to fill in the blank.  
For a given accelerating voltage  $E_a$  and for particular dimensions of CRT, the deflection of the electron beam is \_\_\_\_ to the deflecting voltage.

- Ans**
- ☐ 1. inversely proportional
  - ☐ 2. independent
  - ☒ 3. directly proportional
  - ☐ 4. square proportional

**Q.31** The product of two consecutive positive integers is 277. If the smaller of these two integers is represented by  $x$ , which of the options below will correspond to the equation for finding out the value of  $x$ ?

- Ans**
- ☐ 1.  $x^2 - x - 277 = 0$
  - ☐ 2.  $x^2 + x + 277 = 0$
  - ☒ 3.  $x^2 + x - 277 = 0$
  - ☐ 4.  $x^2 - x + 277 = 0$

**Q.32** Tamper Protection is a feature that prevents unauthorised apps from changing your security settings. Which of the following Operating Systems supports the same?

- Ans**
- ☐ 1. Linux
  - ☐ 2. Windows Vista
  - ☐ 3. Windows XP
  - ☒ 4. Windows 10

**Q.33** When the displacement of a spring is reduced to half its original value, and the spring constant remains unchanged, what happens to the spring's potential energy?

- Ans**
- ☐ 1. It remains unchanged
  - ☐ 2. It increases to 2 times its original value
  - ☐ 3. It decreases to 1/2 of its original value
  - ☒ 4. It decreases to 1/4 of its original value

**Q.34** A and B are two independent events. If  $P(A) = 0.4$  and  $P(B) = 0.6$ , then the  $P(A \text{ or } B)$  is equal to:

- Ans**
- ☐ 1. 0.78
  - ☐ 2. 0.66
  - ☒ 3. 0.76
  - ☐ 4. 0.68

**Q.35** The derived unit for electrical conductance, the Siemens (S), can be expressed in terms of SI base units as \_\_\_\_\_.

- Ans**
- ☒ 1.  $\text{kg}^{-1} \cdot \text{m}^{-2} \cdot \text{s}^3 \cdot \text{A}^2$
  - ☐ 2.  $\text{kg} \cdot \text{m}^2 \cdot \text{s}^{-3} \cdot \text{A}^{-2}$
  - ☐ 3.  $\text{kg}^{-1} \cdot \text{m}^2 \cdot \text{s}^3 \cdot \text{A}^2$
  - ☐ 4.  $\text{kg} \cdot \text{m}^2 \cdot \text{s}^{-3} \cdot \text{A}^{-1}$

**Q.36** UDVA is related to CLDI in a certain way based on the English alphabetical order. In the same way, AJBG is related to IRJO. To which of the following options is YHZE related, following the same logic?

- Ans**
- ☐ 1. GTFY
  - ☐ 2. GHYT
  - ☐ 3. GBHY
  - ☒ 4. GPHM

**Q.37** Refer to the following letter, number and symbol series and answer the question that follows.

(Left) 6 2 8 # 7 \ 2 L % 9 3 3 \ / + H 2 \$ S P # H (Right)

How many such symbols are there that are immediately preceded by a letter and immediately followed by a number?

- Ans**
- ☐ 1. Three
  - ☐ 2. Two
  - ☒ 3. One
  - ☐ 4. Four

**Q.38** A car engine generates a force of 10000 N to move the car 1.2 km in 2 minutes. What is the power of the engine?

- Ans**
- ☐ 1. 10 kW
  - ☐ 2. 1000 kW
  - ☐ 3. 200 kW
  - ☒ 4. 100 kW

**Q.39** Match the options from Group A with Group B regarding Auto Fill Options in MS-Excel sheets.

**Group A Group B**

1. Copy Cells. I. Copy only the cell formatting
2. Fill Formatting Only II. Copy the entire contents of the cell, including the formulas and the formatting
3. Fill Without Formatting III. Copy the contents of the cell, including the formulas but not the formatting

- Ans**
- ☐ 1. 1-III, 2-I, 3-II
  - ☐ 2. 1-I, 2-II, 3-III
  - ☒ 3. 1-II, 2-I, 3-III
  - ☐ 4. 1-II, 2-III, 3-I

**Q.40** The estimated rate of unemployment for the year 2018-19 in urban areas was \_\_\_\_%.

- Ans**
- ☒ 1. 7.7
  - ☐ 2. 9
  - ☐ 3. 5.2
  - ☐ 4. 6.8

**Q.41** If 'A' stands for '+', 'B' stands for 'x', 'C' stands for '+' and 'D' stands for '-', then what will come in place of the question mark (?) in the following equation?

18 A 6 B 11 C 8 D 6 = ?

- Ans**
- ☐ 1. 36
  - ☒ 2. 35
  - ☐ 3. 33
  - ☐ 4. 34

**Q.42** What is the function of the 'AutoFit' feature in MS PowerPoint?

- Ans**
- ☐ 1. Changes the text colour based on the slide background
  - ☐ 2. Aligns text to the centre of the text box
  - ☒ 3. Automatically adjusts the size of the text to fit the text box
  - ☐ 4. Automatically adds bullet points to text

**Q.43** What is the purpose of the 'grep' command in the Linux operating system?

- Ans**
- ☒ 1. To search for a specific pattern in a file
  - ☐ 2. To display the calendar
  - ☐ 3. To rename files
  - ☐ 4. To display system processes

**Q.44** If the voltage across a conductor is doubled while keeping the resistance constant, what happens to the current through the conductor?

- Ans**
- ☒ 1. It doubles
  - ☐ 2. It increases four times
  - ☐ 3. It remains constant
  - ☐ 4. It halves

**Q.45** The p-type material is formed by doping a pure germanium or silicon crystal with impurity atoms having \_\_\_\_ valence electrons. The element most frequently used for this purpose is \_\_\_\_.

- Ans**
- ☒ 1. three; gallium
  - ☐ 2. five; antimony
  - ☐ 3. five; arsenic
  - ☐ 4. three; phosphorus

**Q.46** In a school there are 26 teachers who teach mathematics or physics. Of these, 14 teach mathematics and 6 teach both physics and mathematics. How many teach physics ?

- Ans**
- ☐ 1. 10
  - ☐ 2. 14
  - ☐ 3. 8
  - ☒ 4. 12

**Q.47** If the height of a tower is  $\sqrt{3}$  times its shadow, then the angle of the elevation of the top of the tower is equal to:

- Ans**
- ☐ 1.  $45^\circ$
  - ☐ 2.  $30^\circ$
  - ☒ 3.  $60^\circ$
  - ☐ 4.  $90^\circ$

**Q.48** Six people P, Q, R, S, T and U live on six different floors of the same building. The bottom-most floor of the building is numbered as 1; the floor above it is numbered as 2 and so on. The topmost floor is numbered as 6.

P lives on an even-numbered floor but not on floor number 4. Only two people live between S and P. R lives immediately below T. U lives on an even-numbered floor. Q does not live on the bottom-most floor. How many people live between Q and S?

- Ans**
- ☐ 1. Four
  - ☐ 2. Three
  - ☒ 3. One
  - ☐ 4. Two

**Q.49** What is the name of the astronaut who was selected for the Axiom-4 mission to the International Space Station (ISS) in August 2024?

- Ans**
- ☒ 1. Shubhanshu Shukla
  - ☐ 2. Kamlesh Lulla
  - ☐ 3. Sharmila Bhattacharya
  - ☐ 4. Ashwin Vasavada

Q.50 If the heights of two cones are in the ratio 11 : 9 and their diameters are in th

- Ans
- ☒ 1. 3 : 11
  - ☒ 2. 4 : 11
  - ☒ 3. 11 : 4
  - ☒ 4. 11 : 3

Q.51 Which of the following correctly describes the most useful biasing conditions of the emitter-base and base-collector junctions (common base configuration) for a Bipolar Junction Transistor (BJT) among its different modes of operation?

- Ans
- ☒ 1. Active Mode: Emitter-base junction is forward-biased, and base-collector junction is reverse-biased.
  - ☒ 2. Cut-off Mode: Both emitter-base and base-collector junctions are forward-biased.
  - ☒ 3. Saturation Mode: Both emitter-base and base-collector junctions are reverse-biased.
  - ☒ 4. Active Mode: Emitter-base junction is reverse-biased, and base-collector junction is forward-biased.

Q.52 A metal rod of length 1.5 m moves with a velocity of 10 m/s through a uniform magnetic field of 2 T. What is the magnitude of the induced EMF if the rod moves at an angle of  $60^\circ$  to the magnetic field?

- Ans
- ☒ 1. 26 volts
  - ☒ 2. 30 volts
  - ☒ 3. 36 volts
  - ☒ 4. 18 volts

Q.53 What does the clock speed of a CPU measure?

- Ans
- ☒ 1. The number of instructions executed per second
  - ☒ 2. The amount of cache memory
  - ☒ 3. The amount of data processed per second
  - ☒ 4. The temperature of the CPU

Q.54 The first and last terms of an A.P. are 28 and 31. If the sum of its terms is 236, then the number of terms will be?

- Ans
- ☒ 1. 8
  - ☒ 2. 11
  - ☒ 3. 6
  - ☒ 4. 5

Q.55 Identify the correct order of steps to configure your web browser.

- I. Enable cookies in your web browser
- II. Enable scripts to disable or replace context menus (Mozilla Firefox only)
- III. Enable file download on IE 11 running on Windows 2012
- IV. Enable JavaScript for your web browser

- Ans
- ☒ 1. IV, I, III, II
  - ☒ 2. I, II, III, IV
  - ☒ 3. IV, III, II, I
  - ☒ 4. III, II, IV, I

Q.56 If you need to attach a large file that exceeds the email provider's limit, what is a common solution?

- Ans
- ☒ 1. Use a cloud storage service and share the link.
  - ☒ 2. Compress the file into a .zip format.
  - ☒ 3. Reduce the file's resolution.
  - ☒ 4. Break the file into smaller parts and send multiple emails.

**Q.57** What is the form of the emf produced in thermocouple?  
(where  $\Delta t$  = difference in temperature between the hot thermocouple junction and the reference junction of the thermocouple and a, b are constants)

- Ans**
- ☐ 1.  $E = b e^{-a\Delta t}$
  - ☐ 2.  $E = \frac{a}{(\Delta t)^2}$
  - ☒ 3.  $E = a(\Delta t) + b(\Delta t)^2$
  - ☐ 4.  $E = a(\Delta t)$

**Q.58** Which option in the Print dialog box allows you to specify the range of pages to print in Microsoft Word 2010?

- Ans**
- ☐ 1. Orientation
  - ☒ 2. Pages
  - ☐ 3. Printer
  - ☐ 4. Copies

**Q.59** In an AC circuit, if the power factor is 1, it means that \_\_\_\_.

- Ans**
- ☐ 1. the circuit is purely inductive
  - ☐ 2. the circuit is purely capacitive
  - ☐ 3. all power is reactive power
  - ☒ 4. the circuit is purely resistive

**Q.60** Which of the following terms will replace the question mark (?) in the given series to make it logically complete?  
PU16 QV18 RW22 SX28 ?

- Ans**
- ☐ 1. TZ36
  - ☒ 2. TY36
  - ☐ 3. TY37
  - ☐ 4. TZ37

**Q.61** Which of the following household appliances uses the principle of electromagnetic induction?

- Ans**
- ☐ 1. Electric Iron
  - ☐ 2. Toaster
  - ☒ 3. Electric Fan
  - ☐ 4. Refrigerator

**Q.62** M, S, A, F, J, H and D are seven family members living in the same apartment. M is S's husband. H is J's wife. S is the mother of J and daughter of A. D is the brother of H. F is the wife of A. How is D related to J?

- Ans**
- ☐ 1. Brother
  - ☐ 2. Husband
  - ☒ 3. Wife's brother
  - ☐ 4. Father

**Q.63** Which SI base unit is directly derived from the definition of ampere?

- Ans**
- ☐ 1. Ohm
  - ☐ 2. Volt
  - ☒ 3. Coulomb
  - ☐ 4. Watt

**Q.64** The HCF and the LCM of two numbers are 12 and 300, respectively. If one

- Ans**
- 
- ☐ 1. 88
  - ☐ 2. 49
  - ☐ 3. 69
  - ☒ 4. 40

**Q.65** Which of the following statements is correct for p-n junction diode?

- Ans**
- ☐ 1. There is higher barrier potential at higher junction temperature.
  - ☐ 2. There is no relation between barrier potential and junction temperature.
  - ☒ 3. There is less barrier potential at higher junction temperature.
  - ☐ 4. When diode is conducting, junction temperature is lower than ambient temperature.

**Q.66** In the case of a conservative force, the potential energy \_\_\_\_.

- Ans**
- ☐ 1. is zero
  - ☒ 2. can be defined for any configuration of the system
  - ☐ 3. is path dependent
  - ☐ 4. depends on the work done by friction

**Q.67** What is the purpose of the 'Subject line' in an email?

- Ans**
- ☐ 1. To provide a detailed explanation of the email content
  - ☐ 2. To list the recipients of the email
  - ☐ 3. To include attachments with the email
  - ☒ 4. To give a brief summary of the email's topic

**Q.68** The value of

$$\sqrt{144} + \sqrt{0.04} - \sqrt{9} =$$

- Ans**
- ☐ 1. 8.82
  - ☐ 2. 6.96
  - ☒ 3. 9.2
  - ☐ 4. 11.42

**Q.69** Which of the following will NOT produce an induced current in a coil?

- Ans**
- ☐ 1. Increasing the number of turns in the coil while changing the magnetic flux
  - ☒ 2. Moving the coil parallel to the magnetic field lines
  - ☐ 3. Rotating the coil within a magnetic field
  - ☐ 4. Moving the coil towards a stationary magnet

**Q.70** An open water drum is in the form of a cylinder. The height of the drum is 79 m and its internal diameter is 78 m. Find the area (in  $\text{m}^2$ , rounded off to one decimal place) that needs to be painted if one wants to paint the inside of the drum. Take  $\pi = \frac{22}{7}$

- Ans**
- ☒ 1. 24146.6
  - ☐ 2. 24126.7
  - ☐ 3. 24155.7
  - ☐ 4. 24130.8

**Q.71** Which of the following statements correctly describes the static characteristics of transistors in common emitter configuration?

- Ans**
- ☒ 1. There is a phase shift of  $\pi$  between the input and output voltage.
  - ☐ 2. There is a phase shift of  $\frac{\pi}{2}$  between the input and output voltage.
  - ☐ 3. There is a phase shift of  $\frac{3\pi}{2}$  between the input and output voltage.
  - ☐ 4. There is no phase shift between the input and output voltage.

**Q.72** In an electric motor, what is the purpose of the commutator?

- Ans**
- ☐ 1. To decrease the motor speed
  - ☒ 2. To reverse the direction of current in the armature
  - ☐ 3. To supply current to the armature
  - ☐ 4. To increase the motor speed

**Q.73** In this question, a question is followed by two statements numbered (I) and (II). You have to decide whether the data provided in the statements are sufficient to answer the question. Read both the statements and decide the appropriate answer.

Question: A, B, C, D and E are sitting around a circular table facing the centre. Who sits to the immediate right of A?

Statement (I): Only one person sits between D and C. E sits to the immediate right of D.

Statement (II): B sits to the immediate left of D. Only one person sits between B and E. Only one person sits between E and C.

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

**Q.74** Which of the following forces does NOT conserve mechanical energy?

- Ans**
- ☐ 1. Electrostatic force
  - ☐ 2. Gravitational force
  - ☐ 3. Spring force
  - ☒ 4. Frictional force

**Q.75** After Indian Hockey Federation was dismissed in 2008 by IOA, \_\_\_\_\_ was formed.

- Ans**
- ☐ 1. Indian Hockey
  - ☐ 2. Hockey Association
  - ☐ 3. National Hockey Federation
  - ☒ 4. Hockey India

**Q.76** In an isosceles triangle, the vertex angle measures  $132^\circ$ . What is the measure of each of the base angles?

- Ans**
- ☒ 1.  $24^\circ$  and  $24^\circ$
  - ☐ 2.  $11^\circ$  and  $8^\circ$
  - ☐ 3.  $27^\circ$  and  $21^\circ$
  - ☐ 4.  $4^\circ$  and  $10^\circ$

**Q.77** What was the unemployment rate (UR) in urban areas as of January - March 2024 for persons of age 15 years and above?

- Ans**
- ☐ 1. 67.18%
  - ☐ 2. 48.35%
  - ☒ 3. 6.7%
  - ☐ 4. 53.25%

**Q.78** Choose the correct statement related to government expenditure.

- Ans**
- ☐ 1. Revenue expenditure impacts assets liability of the government.
  - ☐ 2. Revenue expenditure directly contributes to GDP growth.
  - ☒ 3. Capital expenditure directly contributes to GDP growth.
  - ☐ 4. Revenue expenditure does not impact assets liability of the government.

**Q.79** Which of the following options is NOT used to perform the next animation or advance to the next slide in MS PowerPoint?

- Ans**
- ☒ 1. N
  - ☐ 2. Enter
  - ☐ 3. Shift+F5
  - ☐ 4. Page Down

**Q.80** A 5 kg object is pushed with a constant horizontal force of 20 N across a rough surface with a coefficient of kinetic friction  $\mu_k = 0.2$  for a distance of 10 m. What is the net work done on the object? (Given: acceleration due to gravity  $g = 10 \text{ m/s}^2$ )

- Ans**
- ☒ 1. 100 J
  - ☐ 2. 120 J
  - ☐ 3. 160 J
  - ☐ 4. 60 J

**Q.81 What does the middle finger represent in Fleming's Left-Hand Rule?**

- Ans**
- ☐ 1. Direction of magnetic field
  - ☒ 2. Direction of current
  - ☐ 3. Direction of force
  - ☐ 4. Direction of induced EMF

**Q.82 Which of the following statements is true about the accuracy of an analog to digital (A/D) converter?**

- Ans**
- ☐ 1. A dual-slope integrating-type A/D converter has a small accuracy than a single-slope integrating-type A/D converter.
  - ☐ 2. A dual-slope integrating-type A/D converter has the same accuracy as a single-slope integrating-type A/D converter.
  - ☒ 3. A dual-slope integrating-type A/D converter has a higher accuracy than a single-slope integrating-type A/D converter.
  - ☐ 4. A dual-slope integrating-type A/D converter has a very small accuracy than a single-slope integrating-type A/D converter.

**Q.83 What is the full form of PCB?**

- Ans**
- ☐ 1. Picture Circuit Board
  - ☐ 2. Printed Control Board
  - ☐ 3. Picture Control Board
  - ☒ 4. Printed Circuit Board

**Q.84 The quadratic equation whose roots are 9 and 11 is:**

- Ans**
- ☒ 1.  $x^2 - 20x + 99 = 0$
  - ☐ 2.  $x^2 + 20x + 100 = 0$
  - ☐ 3.  $x^2 + 20x - 99 = 0$
  - ☐ 4.  $x^2 - 20x + 98 = 0$

**Q.85 How do you view hidden files and folders in File Explorer in the Windows OS?**

- Ans**
- ☐ 1. Go to 'Edit' -> Select 'Show hidden items'
  - ☒ 2. Go to 'View' -> Select 'Show hidden items'
  - ☐ 3. Go to 'Settings' -> Select 'Hidden files'
  - ☐ 4. Right-click -> Select 'View hidden files'

**Q.86 Which rule is commonly used to determine the direction of the induced EMF in a conductor moving in a magnetic field?**

- Ans**
- ☐ 1. Ampere's Law
  - ☐ 2. Fleming's Left-Hand Rule
  - ☒ 3. Fleming's Right-Hand Rule
  - ☐ 4. Lenz's Law

**Q.87 When multiplying 3.24 by 0.006, how many significant figures should the result have?**

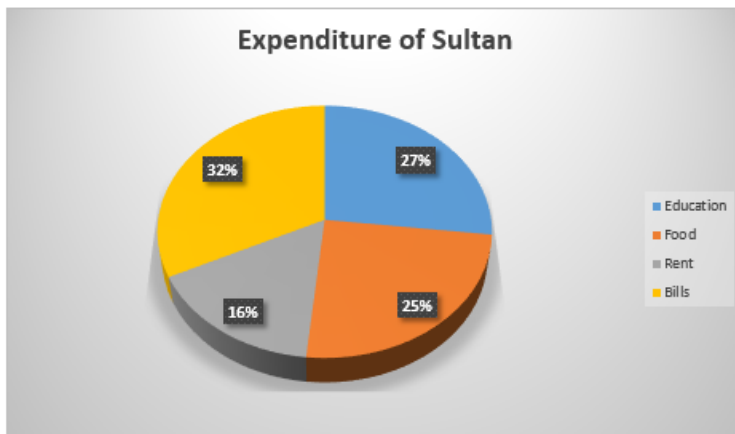
- Ans**
- ☐ 1. 4
  - ☒ 2. 1
  - ☐ 3. 3
  - ☐ 4. 2

**Q.88 Which of the following options is used to search for help topics in MS-Word 2021?**

- Ans**
- ☐ 1. Go to the 'File' tab and select 'Help'.
  - ☐ 2. Click the 'Help' button in the Ribbon.
  - ☐ 3. Access 'Help' from the 'View' tab.
  - ☒ 4. Use the 'Tell me what you want to do' search box.

Q.89 Study the given pie-chart and answer the question that follows.

Monthly percentage expenditure of a Sultan is given in the pie-chart.



What is the monthly expenditure on Food by the Sultan (in ₹) if the total monthly expenditure of the Sultan is ₹10,000?

- Ans
- ☐ 1. 2000
  - ☐ 2. 7700
  - ☒ 3. 2500
  - ☐ 4. 1700

Q.90 In microprocessor 8085, which of the following is a 16-bit register?

- Ans
- ☐ 1. W register
  - ☐ 2. Flag register
  - ☒ 3. Stack pointer
  - ☐ 4. Z register

Q.91 Which of the following is an ancient Jain text written by Acharya Umaswami that explains the Jain philosophy in the most systematic form acceptable to all sects of Jainism?

- Ans
- ☐ 1. Atthapahuda
  - ☐ 2. Svayambhu Stotra
  - ☒ 3. Tattvarthasutra
  - ☐ 4. Pravacanasara

Q.92 What is the formula for the heat produced in a conductor due to the electric current flowing through it?

- Ans
- ☒ 1.  $H = I^2 R t$
  - ☐ 2.  $H = IR^2 t$
  - ☐ 3.  $H = I^2 R / t$
  - ☐ 4.  $H = IR t$

Q.93 A statement is given followed by two arguments. Decide which of the arguments is/are strong with respect to the statement.

Statement:

The Government of State A is planning to shut down all markets by 7 pm.

Arguments:

I. Incidents of shoplifting and attempted robberies have increased especially during night time.

II. Many people get time to shop only after office hours.

- Ans
- ☒ 1. II weakens while I strengthens the statement.
  - ☐ 2. I weakens while II strengthens the statement.
  - ☐ 3. Both I and II weaken the statement.
  - ☐ 4. Both I and II strengthen the statement.

**Q.94** The Mozilla Firefox/Google Chrome/Microsoft Edge requires support for the \_\_\_\_\_ protocol.

- Ans**
- ☐ 1. HTTP 1.2
  - ☐ 2. HTTP 2.1
  - ☐ 3. HTTP 3.1
  - ☒ 4. HTTP 1.1

**Q.95** The points (-5, 1), (1, k) and (4, -2) are collinear if the value of k is

- Ans**
- ☒ 1. -1
  - ☐ 2. 2
  - ☐ 3. 3
  - ☐ 4. 1

**Q** Which of the following statements regarding the microprocessor 8085 is NOT correct?

9  
6

**A** ☒ 1. It can be used to implement three chip microcomputers with supporting I/O devices like IC 8155 and IC 83.

n  
s

☐ 2. It has a mechanism by which it is possible to increase its interrupt handling capacity.

☐ 3. It has serial I/O control, which allows serial communication.

☒ 4.

It does not provide control signal ( $\overline{IO/M}$ ,  $\overline{RW}$ ,  $\overline{WR}$ ) to control the bus cycles, hence external bus controller is req

**Q.97** Select the most appropriate option to fill in the blank.  
Intel 8051 microcontroller has \_\_\_\_ 16-bit timer/counter registers.

- Ans**
- ☐ 1. four
  - ☒ 2. two
  - ☐ 3. one
  - ☐ 4. three

**Q.98** In SI units, what is the unit of angular momentum?

- Ans**
- ☐ 1.  $\text{kg m}^{-1} \text{s}$
  - ☒ 2.  $\text{kg m}^2 \text{s}^{-1}$
  - ☐ 3.  $\text{kg m}^2 \text{s}^{-2}$
  - ☐ 4.  $\text{kg m s}^{-1}$

**Q.99** By which of the following Acts did the rule of the East India Company end in India, and the rule of the crown begin?

- Ans**
- ☐ 1. Government of India Act of 1853
  - ☒ 2. Government of India Act of 1858
  - ☐ 3. Regulating Act of 1813
  - ☐ 4. Pitt's India Act of 1784

**Q.100** The voltage range of resistance-voltage divider is limited to a few:

- Ans**
- ☐ 1. Volts
  - ☐ 2. Micro volts
  - ☒ 3. Kilo Volts
  - ☐ 4. Milli Volts

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Blackbook



## रेल भर्ती बोर्ड / RAILWAY RECRUITMENT BOARDS

सी ई एन आर आर बी - ०२/२०२४ - CEN RRB - 02/2024



|                  |                                         |
|------------------|-----------------------------------------|
| Test Center Name | iON Digital Zone iDZ 2 Chinamushidiwada |
| Test Date        | 19/12/2024                              |
| Test Time        | 12:45 PM - 2:15 PM                      |
| Subject          | RRB Technicians Grade I                 |

**\* 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 : RRB Technicians Grade I

**Q.1** In the following triad, each group of letters is related to the subsequent one following a certain logic. Select from the given options, the one that follows the same logic.

LIVE - IVLE - EVIL

REST - ESRT - TSER

- Ans**
- ☒ 1. WEST - WSET - TSEW
  - ☒ 2. WIND - INWD - INDW
  - ☒ 3. YORK - OYRK - KORY
  - ☒ 4. MUTE - UTME - ETUM

**Q.2** LCDs typically have response times in the range of \_\_\_\_ to \_\_\_\_, whereas LEDs are available with response times below \_\_\_\_.

- Ans**
- ☒ 1. 100 ms; 300 ms; 1000 ns
  - ☒ 2. 10 ms; 30 ms; 10 ns
  - ☒ 3. 100 ms; 300 ms; 100 ns
  - ☒ 4. 10 ms; 30 ms; 100 ns

**Q.3** Eddy currents are produced in a conductor when it is subjected to \_\_\_\_\_.

- Ans**
- ☒ 1. a uniform magnetic field
  - ☒ 2. a changing magnetic field
  - ☒ 3. a constant magnetic field
  - ☒ 4. an electrostatic field

**Q.4** The direction of magnetic field lines inside a bar magnet is \_\_\_\_.

- Ans**
- ☒ 1. from North Pole to South Pole
  - ☒ 2. random
  - ☒ 3. from South Pole to North Pole
  - ☒ 4. perpendicular to the magnetic axis

**Q.5** 64 identical small spheres are cast from a sphere of radius 12 cm, with the total volume of the small spheres being equal to the volume of the larger sphere. The diameter (in cm) of each of the small spheres is:

- Ans
- ☒ 1. 3
  - ☒ 2. 6
  - ☐ 3. 11
  - ☐ 4. 5

**Q.6** The value of  $1^3 - 8^2 + \left(\frac{36}{4}\right)^2 - 0 + 2 \times 5 =$  \_\_\_\_\_

- Ans
- ☒ 1. 28
  - ☐ 2. 37
  - ☐ 3. 38
  - ☐ 4. 27

**Q.7** In  $\triangle PQR$ ,  $3\angle P = 4\angle Q = 6\angle R$ , then find the value of  $\left(\frac{2\angle P - \angle Q}{5}\right)$

- Ans
- ☒ 1. 44°
  - ☐ 2. 65°
  - ☐ 3. 30°
  - ☐ 4. 72°

**Q.8** Intel 8051 microcontroller is a/an:

- Ans
- ☐ 1. 16-bit microcontroller
  - ☐ 2. 64-bit microcontroller
  - ☒ 3. 8-bit microcontroller
  - ☐ 4. 24-bit microcontroller

**Q.9** Which of the following keyboard shortcuts is NOT used in MS Word 2019 to manipulate the formatting of selected text?

- Ans
- ☒ 1. Ctrl + S
  - ☐ 2. Ctrl + I
  - ☐ 3. Ctrl + U
  - ☐ 4. Ctrl + B

**Q.10** Which type of virus attaches itself to executable files and spreads when the file is run?

- Ans
- ☐ 1. Macro Virus
  - ☐ 2. Polymorphic Virus
  - ☐ 3. Boot Sector Virus
  - ☒ 4. File Infector Virus

**Q.11** The Deflection Factor (G) of a CRT (where s is the defection sensitivity) is defined as:

- Ans
- ☐ 1.  $G = s^2$
  - ☒ 2.  $G = \frac{1}{s}$
  - ☐ 3.  $G = s$
  - ☐ 4.  $G = \frac{1}{s^2}$

**Q.12 Which of the following is true for resistors in parallel?**

- Ans**
- ☒ 1. They have the same voltage.
  - ☐ 2. The equivalent resistance is greater than the smallest resistance.
  - ☐ 3. The equivalent resistance is the sum of all resistances.
  - ☐ 4. They have the same current.

**Q.13 Which type of virus is designed to attach itself to documents and spread through macros in programs like Microsoft Word or Excel?**

- Ans**
- ☐ 1. Polymorphic Virus
  - ☒ 2. Macro Virus
  - ☐ 3. Resident Virus
  - ☐ 4. Network Virus

**Q.14 Who inaugurated India's first off-grid Green Hydrogen Plant in the Stainless Steel Sector at Hisar in March 2024?**

- Ans**
- ☒ 1. Jyotiraditya M Scindia
  - ☐ 2. HD Kumaraswamy
  - ☐ 3. Bhupathiraju Srinivasa Varma
  - ☐ 4. Amit Shah

**Q.15 In the equation  $x = A \cos(\omega t + \phi)$ , where  $x$  is displacement,  $\omega$  is angular frequency, and  $\phi$  is phase angle, the equation is dimensionally consistent if \_\_\_\_\_.**

- Ans**
- ☐ 1.  $\omega t$  has dimensions of length and  $\phi$  is dimensionless
  - ☐ 2.  $A$  has dimensions of length and  $\phi$  has dimensions of time
  - ☒ 3.  $A$  has dimensions of length and  $\omega t$  is dimensionless
  - ☐ 4.  $A$  has dimensions of time and  $\omega t$  has dimensions of frequency

**Q.16 What is the name of the service unveiled by Reliance Jio Infocomm Limited, India's first satellite-based gigabit broadband service, in October 2023?**

- Ans**
- ☐ 1. Digital Subscriber Lines
  - ☒ 2. Jio Space Fiber
  - ☐ 3. Jio Fiber Network
  - ☐ 4. Mobile Broadband

**Q.17 Which of the following is the standard method to print a web page using most modern web browsers?**

- Ans**
- ☐ 1. Pressing Ctrl + S (Windows) or Cmd + S (Mac)
  - ☒ 2. Pressing Ctrl + P (Windows) or Cmd + P (Mac)
  - ☐ 3. Right-clicking and selecting 'Save As'
  - ☐ 4. Pressing F12

**Q.18 The mode and median of a data is 87.5 and 86, respectively. What is the mean of the data? (Use empirical formula.)**

- Ans**
- ☐ 1. 84.2
  - ☐ 2. 85.4
  - ☐ 3. 87.1
  - ☒ 4. 85.2

**Q.19 How do you sort data in Microsoft (MS) Excel in ascending or descending order?**

- Ans**
- ☐ 1. By selecting 'Sort' from the Format menu
  - ☐ 2. By clicking on the 'Sort' button in the toolbar
  - ☒ 3. By selecting the data range, then choosing 'Sort' from the Data menu and specifying the sorting criteria and order
  - ☐ 4. By right-clicking on the data and selecting 'Sort' from the context menu

**Q.20** A device operates with a current of 2 A and a voltage of 12 V. What is the energy consumed in 5 minutes?

- Ans**
- ☒ 1. 7200 J
  - ☐ 2. 1440 J
  - ☐ 3. 720 J
  - ☐ 4. 14400 J

**Q.21** The product of  $(x - 9)$  and  $(x + 8)$  is:

- Ans**
- ☐ 1.  $x^2 + x + 72$
  - ☐ 2.  $x^2 + 2x - 72$
  - ☒ 3.  $x^2 - x - 72$
  - ☐ 4.  $x^2 + 72$

**Q.22** K is the husband of S. B is the sister of T. Q is the daughter of E. T is the brother of E. S is the mother of B. How is T related to K?

- Ans**
- ☐ 1. Daughter
  - ☐ 2. Father
  - ☒ 3. Son
  - ☐ 4. Brother

**Q.23** Two parallel current-carrying conductors attract each other with a force of 3 N when placed 2 cm apart. The currents in both conductors are initially the same, and the length of the conductors is constant. If the currents in both conductors are doubled and the distance between them is halved, what will be the new force?

- Ans**
- ☐ 1. 12 N
  - ☒ 2. 24 N
  - ☐ 3. 48 N
  - ☐ 4. 96 N

**Q.24** A thermometer consistently reads  $2^\circ\text{C}$  higher than the actual temperature. This thermometer is \_\_\_\_\_.

- Ans**
- ☐ 1. both accurate and precise
  - ☒ 2. precise but not accurate
  - ☐ 3. accurate but not precise
  - ☐ 4. neither accurate nor precise

**Q.25** The coordinates of the centroid of the triangle ABC whose vertices are A(-5, 7), B(-4, -5) and C(4, 5), is

- Ans**
- ☐ 1.  $(-\frac{7}{3}, \frac{5}{3})$
  - ☒ 2.  $(-\frac{5}{3}, \frac{7}{3})$
  - ☐ 3.  $(-\frac{5}{3}, -\frac{7}{3})$
  - ☐ 4.  $(-\frac{4}{3}, \frac{7}{3})$

**Q.26** Three resistors have the following magnitudes.

$$R_1 = 30\ \Omega \pm 5\%, R_2 = 60\ \Omega \pm 5\%, R_3 = 50\ \Omega \pm 5\%$$

Determine the magnitude of limiting resultant resistance when all three resistances are connected in series.

- Ans**
- ☐ 1.  $27.27 \pm 15\ \Omega$
  - ☐ 2.  $27.27 \pm 7\ \Omega$
  - ☒ 3.  $140 \pm 7\ \Omega$
  - ☐ 4.  $140 \pm 15\ \Omega$

**Q.27** Evaluate:  $\frac{1}{\left(\frac{2}{3}\right) + \left(\frac{3}{5}\right)} \div \frac{8}{39}$

- Ans**
- ☐ 1.  $3\frac{16}{19}$
  - ☐ 2.  $3\frac{65}{76}$
  - ☒ 3.  $3\frac{28}{33}$
  - ☐ 4.  $3\frac{17}{23}$

**Q.28** Which of the following statements is FALSE with respect to Style Set in Outlook for writing an email?

- Ans**
- ☐ 1. You can change the colors or fonts that are used in a Style Set by clicking Change Styles in the Styles group, and then clicking Colors or Fonts.
  - ☐ 2. You can see how a Quick Style set will look in a message by pointing to a Style Set without clicking it.
  - ☐ 3. If you changed the styles in a message and the styles are not updating the way you expected, click the Styles Dialog Box Launcher, and then click the Style Inspector button (located at the bottom of the pane) to find out whether text was manually formatted instead of formatted by using styles.
  - ☒ 4. After you select a Style, you can see a list of the style sets available within the styles. In the Styles group, click the Styles Dialog Box Launcher .

**Q.29** Dimensional consistency of an equation implies that \_\_\_\_.

- Ans**
- ☐ 1. the equation is correct in all circumstances
  - ☒ 2. the equation respects the principles of homogeneity of dimensions
  - ☐ 3. the units of measurement can be easily converted
  - ☐ 4. the physical quantities involved are related correctly

**Q.30** Which country hosted the 2023 Men's Hockey World Cup?

- Ans**
- ☒ 1. India
  - ☐ 2. Pakistan
  - ☐ 3. Germany
  - ☐ 4. China

**Q.31** What happens when you click the 'Font Color' button in the Home tab of MS-Word?

- Ans**
- ☒ 1. It opens a drop-down list of colors to choose from.
  - ☐ 2. It changes the background color of the selected text.
  - ☐ 3. It changes the font color of the selected text to the default color.
  - ☐ 4. It opens the Font dialog box.

**Q.32 Which of the following is NOT a disadvantage of LAN?**

- Ans**
- ☐ 1. It has a high initial setup cost.
  - ☐ 2. It restricts the size of the network.
  - ☐ 3. It can face security issues if the central server is not properly secured.
  - ☒ 4. It has high data transmission rates.

**Q.33 When a conductor moves through a magnetic field, an induced current is produced. The direction of the induced current is determined by \_\_\_\_\_.**

- Ans**
- ☐ 1. Ampere's Law
  - ☐ 2. Coulomb's Law
  - ☐ 3. Faraday's Law
  - ☒ 4. Lenz's Law

**Q.34 Dead time is the time required by an instrument to \_\_\_\_ to respond to change in \_\_\_\_ quantity.**

- Ans**
- ☐ 1. stop; output
  - ☐ 2. begin; output
  - ☒ 3. begin; input
  - ☐ 4. stop; input

**Q.35 Which of the following methods is used to create a custom series in MS-Excel?**

- Ans**
- ☐ 1. Using Sort & Filter
  - ☒ 2. Using the Fill Handle and dragging
  - ☐ 3. Using Data Validation
  - ☐ 4. Using Conditional Formatting

**Q.36 The band gap between conduction and valence band in metals is:**

- Ans**
- ☐ 1. 0.7 eV
  - ☒ 2. 0 eV
  - ☐ 3. 1.1 eV
  - ☐ 4. 6.0 eV

**Q.37 How can you quickly change the case of selected text in MS Word?**

- Ans**
- ☐ 1. Change it manually by typing the text again
  - ☐ 2. Go to the 'Home' tab and click on 'Change Case'
  - ☒ 3. Use the keyboard shortcut 'Shift + F3'
  - ☐ 4. Right-click the selected text and choose 'Font'

**Q.38 The work done by a variable force is given by which of the following?**

- Ans**
- ☐ 1.  $W = \frac{1}{2} mv^2$
  - ☐ 2.  $W = F \cos \theta$
  - ☒ 3.  $W = \int F dx$
  - ☐ 4.  $W = F \cdot d$

**Q.39 In a survey of 350 students in a college, 150 students were found to be taking tea and 225 taking coffee, 100 were taking both tea and coffee. Find how many students were taking neither tea nor coffee?**

- Ans**
- ☒ 1. 75
  - ☐ 2. 55
  - ☐ 3. 85
  - ☐ 4. 65

**Q.40** If the quadratic equation  $x^2 - 4ax + (b + 1) = 0$ , where  $a$  and  $b$  are real constants, has no real roots, then:

- Ans**
- ☒ 1.  $b > (2a + 1)(2a - 1)$
  - ☐ 2.  $b < (2a + 1)(2a - 1)$
  - ☐ 3.  $b > (a + 1)(a - 1)$
  - ☐ 4.  $b < (a + 1)(a - 1)$

**Q.41** 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 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 pair.)

- Ans**
- ☐ 1. SL-RX
  - ☐ 2. RK-QW
  - ☐ 3. LE-KQ
  - ☒ 4. OH-MT

**Q.42** Select the most appropriate options to fill in the blanks.  
\_\_\_\_\_ are used in load cells and proving rings to measure \_\_\_\_\_ produced.

- Ans**
- ☐ 1. Piezoelectric transducers; strain by the force
  - ☐ 2. Linear Variable Differential Transformer (LVDT); strain by the force
  - ☐ 3. Capacitive transducers; force by the strain
  - ☒ 4. Strain gauges; force by the strain

**Q.43** Select the most appropriate options to fill in the blanks.  
L.V.D.T. shows \_\_\_\_\_ hysteresis and hence repeatability is \_\_\_\_\_ under all conditions.

- Ans**
- ☐ 1. high; bad
  - ☐ 2. high; excellent
  - ☐ 3. low; bad
  - ☒ 4. low; excellent

**Q.44** Select the most appropriate option to fill in the blank.  
Intel 8051 microcontroller has \_\_\_\_\_ internal RAM.

- Ans**
- ☐ 1. 64-byte
  - ☒ 2. 128-byte
  - ☐ 3. 32-byte
  - ☐ 4. 16-byte

**Q.45** The brightness of LED depends upon \_\_\_\_\_; when source voltage is much \_\_\_\_\_ than diode voltage, then the brightness of the LED is approximately constant.

- Ans**
- ☐ 1. current; smaller
  - ☐ 2. temperature; greater
  - ☒ 3. current; greater
  - ☐ 4. temperature; smaller

**Q.46** Which of the following factors does NOT affect the strength of the magnetic field inside a solenoid?

- Ans**
- ☒ 1. Length of the solenoid
  - ☐ 2. Presence of a magnetic core
  - ☐ 3. Number of turns per unit length
  - ☐ 4. Current flowing through the solenoid

**Q.47** A statement is given followed by two arguments. Decide which of the arguments is/are strong with respect to the statement.

**Statement:**

The Government of country B has urged its citizens to invest in rain water harvesting and avail subsidies in doing so.

**Arguments:**

I. Ground water resources have been continuously depleting in country B.

II. Country B experiences heavy rainfall during the monsoon season leading to flooding in many low-lying areas.

- Ans**
- ☐ 1. I weakens while II strengthens the statement.
  - ☐ 2. II weakens while I strengthens the statement.
  - ☒ 3. Both I and II strengthen the statement.
  - ☐ 4. Both I and II weaken the statement.

**Q.48** The value of  $3^3 - 5^2 + \left(\frac{26}{13}\right)^2 - 8 + 0 \times 9 =$  \_\_\_\_\_

- Ans**
- ☐ 1. -4
  - ☐ 2. -5
  - ☒ 3. -2
  - ☐ 4. -3

**Q.49** In an isosceles triangle, the vertex angle measures  $76^\circ$ . What is the measure of each of the base angles?

- Ans**
- ☐ 1.  $43^\circ$  and  $62^\circ$
  - ☐ 2.  $32^\circ$  and  $49^\circ$
  - ☐ 3.  $55^\circ$  and  $49^\circ$
  - ☒ 4.  $52^\circ$  and  $52^\circ$

**Q.50** What will come in the place of the question mark '?' in the following equation, if '+' and '-' are interchanged and 'x' and '÷' are interchanged?

$$15 \times 5 \div 7 - 8 + 9 = ?$$

- Ans**
- ☐ 1. 19
  - ☒ 2. 20
  - ☐ 3. 18
  - ☐ 4. 17

**Q.51** In the interim budget of the union government, what budget has been allocated for Samagra Shiksha Abhiyan for the Financial Year 2024-25?

- Ans**
- ☐ 1. ₹47,500 crore
  - ☒ 2. ₹37,500 crore
  - ☐ 3. ₹40,200 crore
  - ☐ 4. ₹53,500 crore

**Q.52** Which of the following statements is true regarding the factors affecting the resistance of a conductor?

- Ans**
- ☐ 1. Resistance is inversely proportional to the resistivity of the material.
  - ☒ 2. Resistance increases with an increase in the temperature for most metals.
  - ☐ 3. Resistance is directly proportional to the cross-sectional area of the conductor.
  - ☐ 4. Resistance is independent of the conductor's length.

**Q.53** In which year was Pitt's India Act passed by the British Parliament?

- Ans**
- ☐ 1. 1853
  - ☐ 2. 1774
  - ☒ 3. 1784
  - ☐ 4. 1857

**Q.54** Which of the following are copper deposits fields in India?

- Ans**
- ☐ 1. Singareni and Singrauli
  - ☒ 2. Khetri and Kolihan
  - ☐ 3. Jharia and Raniganj
  - ☐ 4. Pench and Kanhan

**Q.55** What should come in place of the question mark (?) in the given series?

1023 1024 1027 1032 1039 ?

- Ans**
- ☐ 1. 1046
  - ☐ 2. 1045
  - ☐ 3. 1047
  - ☒ 4. 1048

**Q.56** Which of the following represents the applications used primarily for messaging and communication?

- Ans**
- ☒ 1. WhatsApp and Telegram
  - ☐ 2. Safari and MS Word
  - ☐ 3. Gmail and Firefox
  - ☐ 4. Telegram and Safari

**Q.57** In which of the following devices are eddy currents utilised beneficially?

- Ans**
- ☐ 1. Electric heaters
  - ☐ 2. Electric motors
  - ☐ 3. Transformer cores
  - ☒ 4. Induction furnaces

**Q.58** What will happen to the power consumed by a device if the current flowing through it is doubled while the resistance remains constant?

- Ans**
- ☐ 1. Power will decrease.
  - ☐ 2. Power will double.
  - ☒ 3. Power will quadruple.
  - ☐ 4. Power will remain the same.

**Q.59** Refer to the following letter, number and symbol series and answer the question that follows.

(Left) + 2 \$ Q = Y L A S S X L / % 9 T \ = X H 6 ? (Right)

How many such numbers are there that are immediately preceded by a symbol and immediately followed by a letter?

- Ans**
- ☐ 1. Three
  - ☐ 2. Two
  - ☒ 3. One
  - ☐ 4. Four

**Q.60** What does the 'IF' function do in MS-Excel?

- Ans**
- ☐ 1. It sorts the data.
  - ☒ 2. It checks a condition and returns one value if true and another if false.
  - ☐ 3. It filters the data.
  - ☐ 4. It sums up the data.

**Q.61** The deflection sensitivity (s) of a CRT (cathode ray tube) is defined as:  
(where D is deflection of the screen and E is deflection voltage)

- Ans**
- ☐ 1.  $s = D \times E$
  - ☐ 2.  $s = \left(\frac{D}{E}\right)^2$
  - ☒ 3.  $s = \frac{D}{E}$
  - ☐ 4.  $s = \sqrt{\frac{D}{E}}$

**Q.62** Which of the following Articles of the Indian Constitution states that it is the duty of the State to raise the level of nutrition and the standard of living of its people and to improve public health?

- Ans**
- ☐ 1. Article 44
  - ☒ 2. Article 47
  - ☐ 3. Article 51
  - ☐ 4. Article 42

**Q.63** In which of the following cases will there be NO induced EMF in a coil?

- Ans**
- ☐ 1. The coil is rotated in a magnetic field.
  - ☐ 2. The magnetic flux through the coil is changing.
  - ☐ 3. The coil is moved perpendicular to the magnetic field lines.
  - ☒ 4. The coil is moved parallel to the magnetic field lines.

**Q.64** What does the 'This PC' icon on a Windows desktop represent?

- Ans**
- ☒ 1. Access to drives, files and system properties
  - ☐ 2. A shortcut to the Control Panel
  - ☐ 3. An application launcher
  - ☐ 4. A file that stores system updates

**Q.65** Which of the following is NOT an example of application software?

- Ans**
- ☒ 1. Windows Vista
  - ☐ 2. Google Chrome
  - ☐ 3. WhatsApp
  - ☐ 4. Adobe Photoshop

**Q.66** Find the value of the given expression.

$$\frac{\cos A}{1 - \tan A} + \frac{\sin^2 A}{\sin A - \cos A} + 2\sin A - \cos A$$

- Ans**
- ☒ 1.  $3\sin A$
  - ☐ 2.  $3\cos A$
  - ☐ 3.  $\sin A$
  - ☐ 4.  $\cos A$

**Q.67** A particle starts from rest and accelerates uniformly along a straight line with acceleration  $a$ . After a time  $t$ , its velocity is  $v$ . If the particle continues to accelerate for the next  $2t$ , what will be the ratio of the distance travelled in the first  $t$  seconds to that in the next  $2t$  seconds?

- Ans
- ☐ 1. 1 : 6
  - ☐ 2. 1 : 4
  - ☒ 3. 1 : 8
  - ☐ 4. 1 : 12

**Q.68** Which property of the material of a conductor determines its resistivity?

- Ans
- ☐ 1. Density
  - ☒ 2. Electrical conductivity
  - ☐ 3. Temperature coefficient
  - ☐ 4. Melting point

**Q.69** In the following number-pairs, the second number is obtained by applying certain mathematical operations to the first number. Which numbers should replace X and Y so that the pattern followed by the two numbers on the left side of :: is same as that on the right side of ::?

(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 to 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed.)

X : 40 :: 60 : Y

- Ans
- ☐ 1. X=32, Y=70
  - ☐ 2. X=30, Y=75
  - ☒ 3. X=32, Y=75
  - ☐ 4. X=36, Y=68

**Q.70** The full form of DDR SDRAM is \_\_\_\_\_.

- Ans
- ☐ 1. Data Dynamic Rate Synchronous Dynamic Random Access Memory
  - ☒ 2. Double Data Rate Synchronous Dynamic Random Access Memory
  - ☐ 3. Double Data Rate Systematic Dynamic Random Access Memory
  - ☐ 4. Dynamic Data Rate Systematic Dynamic Random Access Memory

**Q.71** If an event has odds in favour 4 : 5, then the probability that the event will NOT occur is:

- Ans
- ☐ 1.  $\frac{4}{5}$
  - ☒ 2.  $\frac{5}{9}$
  - ☐ 3.  $\frac{4}{9}$
  - ☐ 4.  $\frac{1}{5}$

**Q.72** The induced potential difference in a conductor is directly proportional to \_\_\_\_.

- Ans
- ☐ 1. the area of the conductor
  - ☐ 2. the temperature of the conductor
  - ☒ 3. the speed of the conductor's motion through the magnetic field
  - ☐ 4. the resistance of the conductor

**Q.73** Which view is primarily used to run a slide show in MS-PowerPoint?

- Ans**
- ☐ 1. Normal View
  - ☐ 2. Slide Sorter View
  - ☐ 3. Notes Page View
  - ☒ 4. Slide Show View

**Q.74** The SI unit for measuring very large distances, such as astronomical distances, is \_\_\_\_\_.

- Ans**
- ☐ 1. metre
  - ☐ 2. astronomical unit
  - ☒ 3. light-year
  - ☐ 4. kilometre

**Q.75** Which element is typically found at the bottom left of the desktop in the Windows OS?

- Ans**
- ☐ 1. Notification Center
  - ☐ 2. Recycle Bin
  - ☒ 3. Start Menu
  - ☐ 4. Quick Access Toolbar

**Q.76** The probability that a student passes a Mathematics test is  $\frac{3}{4}$  and the probability that he passes both the Mathematics and a Physics test is  $\frac{13}{36}$ . The probability that he passes at least one test is  $\frac{5}{6}$ . What is the probability that he passes the Physics test?

- Ans**
- ☐ 1.  $\frac{5}{36}$
  - ☒ 2.  $\frac{4}{9}$
  - ☐ 3.  $\frac{5}{9}$
  - ☐ 4.  $\frac{7}{9}$

**Q.77** Select the most appropriate options to fill in the blanks.  
Microprocessor 8085 has \_\_\_\_\_ address line, hence it can access \_\_\_\_\_ of the memory.

- Ans**
- ☐ 1. 16; 32 kilobytes
  - ☐ 2. 8; 32 kilobytes
  - ☒ 3. 16; 64 kilobytes
  - ☐ 4. 8; 64 kilobytes

**Q.78** When printing a web page, what is the 'Margins' setting control?

- Ans**
- ☐ 1. The color scheme of the web page
  - ☒ 2. The space between the content and the edges of the printed page
  - ☐ 3. The number of pages the content will span
  - ☐ 4. The font size of the content

**Q.79** There are two types of links supported in the NTFS file system, \_\_\_\_\_.

- Ans**
- ☐ 1. soft links and direct linking
  - ☐ 2. hard links and direct linking
  - ☒ 3. hard links and junctions
  - ☐ 4. soft links and junctions

**Q.80** Which of the following terms will replace the question mark (?) in the given series to make it logically complete?  
LQ13 MR20 NS27 OT34 ?

- Ans**
- ☐ 1. PU42
  - ☐ 2. PV42
  - ☐ 3. PV41
  - ☒ 4. PU41

**Q.81** Which of the following is true according to the work-energy theorem?

- Ans**
- ☐ 1. Kinetic energy is always conserved
  - ☐ 2. Work done on an object always increases its kinetic energy
  - ☒ 3. Work done on an object can either increase or decrease its kinetic energy
  - ☐ 4. The work done on an object is always positive

**Q.82** What is term used to refer the 'exports to foreigners' in the circular flow of income diagram?

- Ans**
- ☐ 1. leakage
  - ☐ 2. expenditure
  - ☐ 3. Investment
  - ☒ 4. injection

**Q.83** Which of the following is a Dharmashastra?

- Ans**
- ☐ 1. Arthashastra
  - ☐ 2. Meghadoota
  - ☐ 3. Shakuntala
  - ☒ 4. Bhagvad Gita

**Q.84** You can save your MS-PowerPoint presentation in the newest format \_\_\_\_, or as an MS-PowerPoint 97-2003 Presentation \_\_\_\_.

- Ans**
- ☒ 1. (.pptx), (.ppt)
  - ☐ 2. (.odp), (.ppt)
  - ☐ 3. (.docx), (.doc)
  - ☐ 4. (.ppt), (.pptx)

**Q.85** Which of the following statements is correct about a transistor?

- Ans**
- ☐ 1. Emitter region is much thinner as compared to base and collector.
  - ☐ 2. Collector region is much thinner as compared to emitter and base.
  - ☐ 3. All the three regions emitter, base and collector have the same size.
  - ☒ 4. Base region is much thinner as compared to emitter and collector.

**Q.86** Read the given statement and conclusions carefully and decide which of the given conclusions follow(s) from the statement.

**Statement:**

'It's a bright sunny day today so let's have breakfast at the beach and then go the museum which you all so desperately wanted to visit' – a father told his children.

**Conclusions:**

(i) All family picnics must be planned only on bright sunny days.

(ii) Science museums are very educational as well as fun for children.

- Ans**
- ☒ 1. Only conclusion (i) follows
  - ☒ 2. Neither conclusion (i) nor (ii) follows
  - ☒ 3. Only conclusion (ii) follows
  - ☒ 4. Both the conclusions follow

**Q.87** Read the given statements and conclusions carefully. You have to take the given statements to be true even if they seem to be at variance from commonly known facts. You have to decide which conclusion/s logically follow/s from the given statements.

**Statements:**

All parks are grounds.

Some grounds are museums.

No museum is a theatre.

**Conclusions:**

(I) All museums are parks.

(II) No ground is a theatre.

- Ans**
- ☒ 1. Only conclusion II follows.
  - ☒ 2. Neither conclusion I nor II follows.
  - ☒ 3. Only conclusion I follows.
  - ☒ 4. Both conclusions I and II follow.

**Q.88** If  $A = \{3, 5, 7, 9, 11\}$ ,  $B = \{7, 9, 11, 13\}$ ,  $C = \{11, 13, 15\}$ , find  $A \cap (B \cup C)$ .

- Ans**
- ☒ 1.  $\{7, 9, 11\}$
  - ☒ 2.  $\{5, 7, 9, 11\}$
  - ☒ 3.  $\{3, 7, 9, 11\}$
  - ☒ 4.  $\{3, 5, 7, 9, 11\}$

**Q.89** If 15th and 28th terms of an A.P. be 208 and 416 respectively, then its 49th term is:

- Ans**
- ☒ 1. 749
  - ☒ 2. 751
  - ☒ 3. 752
  - ☒ 4. 755

**Q.90** The first and last terms of an A.P. are 20 and 55. If the sum of its terms is 600, then the number of terms will be?

- Ans**
- ☒ 1. 14
  - ☒ 2. 16
  - ☒ 3. 17
  - ☒ 4. 15

**Q.91** In the following number-pairs, the second number is obtained by applying certain mathematical operations to the first number. Which numbers should replace X and Y so that the pattern followed by the two numbers on the left side of :: is same as that on the right side of ::?

(NOTE : Operations should be performed on the whole numbers, without breaking down the numbers into its 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.)

X : 35 :: 8 : Y

- Ans**
- ☐ 1. X = 3 , Y = 74
  - ☐ 2. X = 10 , Y = 20
  - ☒ 3. X = 7 , Y = 48
  - ☐ 4. X = 6 , Y = 68

**Q.92** The work done by non-conservative forces in a closed loop is \_\_\_\_.

- Ans**
- ☐ 1. always zero
  - ☐ 2. negative
  - ☐ 3. independent of the path
  - ☒ 4. dependent on the path

**Q.93** Which of the following orders is correct for the doping level in transistors?

- Ans**
- ☐ 1. Emitter < base < collector
  - ☒ 2. Base < collector < emitter
  - ☐ 3. Collector < base < emitter
  - ☐ 4. Base < emitter < collector

**Q.94** A car manufacturing company is sponsoring a basketball match by painting its logo on the basketball at the rate of ₹3/ cm<sup>2</sup>. There are two identical basketballs of diameter 14 cm which are to be painted. What will be the total cost (in ₹) of painting the balls for the company?

- Ans**
- ☐ 1. 4928
  - ☐ 2. 3586
  - ☒ 3. 3696
  - ☐ 4. 1848

**Q.95** In this question, a question is followed by two statements numbered (I) and (II). You have to decide whether the data provided in the statements are sufficient to answer the question. Read both the statements and decide the appropriate answer.

Question: Five people V, W, X, Y and Z are sitting in a straight row, facing north. Who sits to the immediate left of Z?

Statement (I): Both V and X are immediate neighbours of Y. V sits at one of the extreme ends of the row.

Statement (II): Z sits to the immediate left of W. W sits at one of the extreme ends of the row.

- Ans**
- ☐ 1. Data in statement II alone is sufficient to answer the question while data in statement I is not.
  - ☐ 2. Data in either statement I alone or statement II alone are sufficient to answer the question.
  - ☒ 3. Data in statements I and II together are sufficient to answer the question.
  - ☐ 4. Data in statement I alone is sufficient to answer the question while data in statement II is not.

**Q.96** A tower stands vertically on the ground. From a point on the ground, 30 m away from the foot of the tower, the angle of elevation of the top of the tower is  $30^\circ$ . What is the height (in metres) of the tower?

- Ans
- ☒ 1.  $15\sqrt{3}$
  - ☒ 2.  $20\sqrt{3}$
  - ☒ 3.  $30\sqrt{3}$
  - ☒ 4.  $10\sqrt{3}$

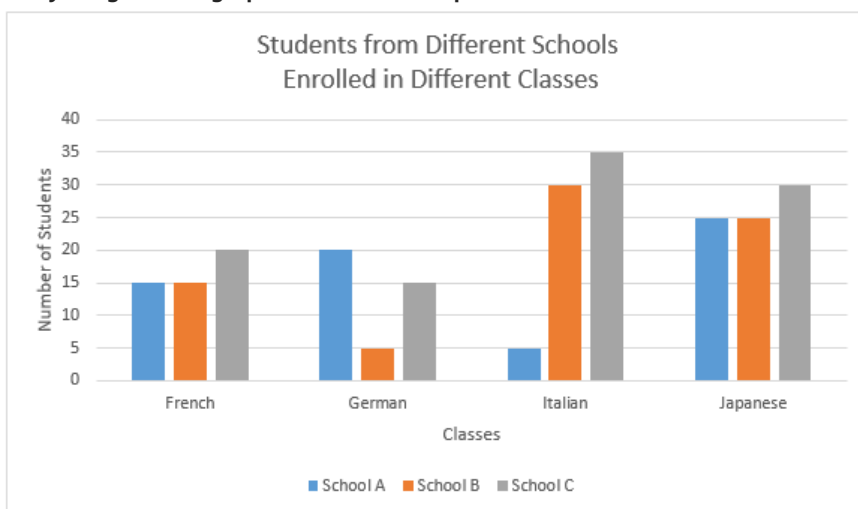
**Q.97** If the points A(1, 2), B(4, 3), C(1, 0) and D(k, -1) are the vertices of a parallelogram then, the value of k is :

- Ans
- ☒ 1. -1
  - ☒ 2. -2
  - ☒ 3. 2
  - ☒ 4. 1

**Q.98** D, E, F, G, H, I, and J, each has an exam on a different day of a week starting from Monday and ending on Sunday of the same week.  
 E has the exam on Friday. Only one person has the exam between E and D. J has the exam on the day immediately after E. H has the exam on the day immediately after D. Only two people have exams between H and G. F has the exam on the day immediately before D. I does not have the exam on Monday.  
 How many people have exams between J and F?

- Ans
- ☒ 1. Four
  - ☒ 2. Five
  - ☒ 3. Three
  - ☒ 4. Two

**Q.99** Study the given bar graph and answer the question that follows.



The given bar graph shows the number of students from different schools enrolled in different classes. Which class has the maximum students from school C?

- Ans
- ☒ 1. Japanese
  - ☒ 2. Italian
  - ☒ 3. French
  - ☒ 4. German

**Q.100** What is India's average annual HDI growth for the period 1990-2019?

**Ans**  1. 1.42

 2. 1.21

 3. 1.58

 4. 1.44

2024/12/21-18:59:12



## रेल भर्ती बोर्ड / RAILWAY RECRUITMENT BOARDS

सी ई एन आर आर बी - ०२/२०२४ - CEN RRB - 02/2024



|                  |                                 |
|------------------|---------------------------------|
| Test Center Name | iON Digital Zone IDZ Karmanghat |
| Test Date        | 19/12/2024                      |
| Test Time        | 4:30 PM - 6:00 PM               |
| Subject          | RRB Technicians Grade I         |

**\* 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 : RRB Technicians Grade I

**Q.1** In the following number-pairs, the second number is obtained by applying certain mathematical operations to the first number. Which numbers should replace X and Y so that the pattern followed by the two numbers on the left side of :: is same as that on the right side of ::?

(NOTE: Operations should be performed on the whole numbers, without breaking down the numbers into its 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.)

X : 49 :: 17 : Y

Ans ☒ 1. X = 23, Y = 37

☐ 2. X = 21, Y = 37

☐ 3. X = 31, Y = 34

☐ 4. X = 25, Y = 39

**Q.2** What are the major branches of Buddhism?

Ans ☐ 1. Pathachari and Paribrajaka

☐ 2. Svetambara and Digambara

☐ 3. Anga and Upanga

☒ 4. Hinayana and Mahayana

**Q.3** Match the following geographical features with their respective region:

|                    |                                        |
|--------------------|----------------------------------------|
| A. Karewas         | I. Eastern Ghats                       |
| B. Barchans        | II. Kashmir region                     |
| C. Mahendragiri    | III. Coastal plain along Bay of Bengal |
| D. Northern Circar | IV. Thar desert                        |

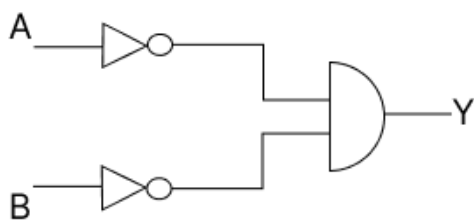
Ans ☐ 1. A-I, B-III, C-II, D-IV

☐ 2. A-IV, B-II, C-III, D-I

☐ 3. A-III, B-I, C-IV, D-II

☒ 4. A-II, B-IV, C-I, D-III

Q.4 The given logic gate diagram is equivalent to \_\_\_\_.



- Ans
- ☐ 1. NAND GATE
  - ☐ 2. OR GATE
  - ☐ 3. AND GATE
  - ☒ 4. NOR GATE

Q.5 What is the range supported in MS-Word to change the size of the selected text?

- Ans
- ☐ 1. Between 1 and 1500, in multiples of 1 (such as 10 or 105)
  - ☒ 2. Between 1 and 1638, in multiples of .5 (such as 10.5 or 105.5)
  - ☐ 3. Between 0.5 and 2000, in multiples of .5 (such as 10.5 or 105.5)
  - ☐ 4. Between 0.5 and 1000, in multiples of .5 (such as 10.5 or 105.5)

Q.6 Two dice (both numbered 1 to 6) are rolled, simultaneously. What is the probability of observing a sum of 8?

- Ans
- ☐ 1.  $\frac{5}{6}$
  - ☐ 2.  $\frac{7}{36}$
  - ☒ 3.  $\frac{5}{36}$
  - ☐ 4.  $\frac{1}{6}$

Q.7 The direction of the magnetic field around an infinitely long straight current-carrying wire is:

- Ans
- ☐ 1. perpendicular to the plane containing the wire and the point
  - ☐ 2. radial inward toward the wire
  - ☒ 3. tangential to the wire and depends on the direction of the current
  - ☐ 4. radial outward from the wire

Q.8

Evaluate:  $\frac{1}{\left(\frac{5}{6}\right) + \left(\frac{7}{9}\right)} \div \frac{5}{23}$

Ans

☐ 1.  $2\frac{53}{61}$

☒ 2.  $2\frac{59}{69}$

☐ 3.  $4\frac{1}{27}$

☐ 4.  $2\frac{5}{6}$

Q.9 The ratio of the lengths of two corresponding sides of two similar triangles is 6 : 2.  
The ratio of the areas of these two triangles, in the order mentioned, is:

Ans

☐ 1. 6 : 2

☐ 2.  $6\sqrt{6} : 2$

☒ 3. 36 : 4

☐ 4. 37 : 5

Q.10 Anurag starts from Point Y and drives 11 km towards North. He then takes a right turn, drives 25 km, turns right and drives 27 km. He then takes a right turn and drives 11 km. He takes a right turn, drives 41 km. He then turns left, drives 14 km and stops at Point Z. How far (shortest distance) and towards which direction should he drive in order to reach Point Y again? (All turns are 90 degrees turns only unless specified)

Ans

☐ 1. 14 km towards North

☐ 2. 30 km towards South

☐ 3. 36 km towards North

☒ 4. 25 km towards South

Q.11 Select the correct option for the band gap energies of Ge, Si and GaAs.  
Where  $E(\text{Ge})$  = band gap energy of Ge,  $E(\text{Si})$  = band gap energy of Si and  $E(\text{GaAs})$  = band gap energy of GaAs

Ans

☒ 1.  $E(\text{GaAs}) > E(\text{Si}) > E(\text{Ge})$

☐ 2.  $E(\text{GaAs}) > E(\text{Ge}) > E(\text{Si})$

☐ 3.  $E(\text{Ge}) > E(\text{Si}) > E(\text{GaAs})$

☐ 4.  $E(\text{Ge}) > E(\text{GaAs}) > E(\text{Si})$

Q.12 Refer to the following letter, number and symbol series and answer the question that follows.

(Left) Q C 9 U @ 8 D & A D V 9 2 2 @ ^ L Y A / + K (Right)

How many such letters are there that are immediately preceded by a number and immediately followed by a symbol?

Ans

☐ 1. Four

☐ 2. Three

☒ 3. Two

☐ 4. One

**Q.13** Rearrange the following search engines according to the popularity of people using it.

- I. Yahoo
- II. Google
- III. Bing
- IV. Yandex

**Ans** ☒ 1. I, II, III, IV  
☒ 2. IV, III, II, I  
☒ 3. II, I, IV, III  
☒ 4. II, III, I, IV .

**Q.14** The SI unit of current, the Ampere, is defined based on \_\_\_\_\_.

**Ans** ☒ 1. the force between two charges  
☒ 2. the electric potential difference  
☒ 3. the magnetic flux through a loop  
☒ 4. the force between two current-carrying conductors

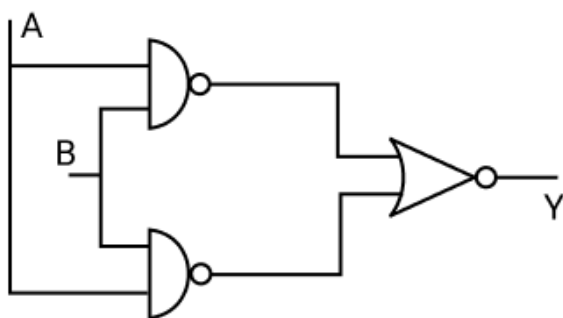
**Q.15** If a machine does 3000 J of work in 15 seconds, what is the power output of the machine?

**Ans** ☒ 1. 450 W  
☒ 2. 5 mW  
☒ 3. 200 W  
☒ 4. 5 W

**Q.16** According to a National Crime Records Bureau (NCRB) report, which was the most corrupted state in India in December 2023?

**Ans** ☒ 1. Rajasthan  
☒ 2. Bihar  
☒ 3. Uttar Pradesh  
☒ 4. Maharashtra

**Q.17** Find the Boolean expression for the given logic gate circuit diagram where inputs are A and B.



**Ans** ☒ 1.  $A + B$   
☒ 2.  $\overline{A + B}$   
☒ 3.  $AB$   
☒ 4.  $\overline{AB}$

- Q.18** A statement is given followed by two arguments. Decide which of the arguments is/are strong with respect to the statement.  
**Statement:**  
For the fifth consecutive day, the government announced an increase in the price of petrol by ₹2.  
**Arguments:**  
I. The international market has reduced fuel production.  
II. Taxes on petrol imports have increased.

**Ans** ☒ 1. II weakens while I strengthens the statement.  
☒ 2. Both I and II weaken the statement.  
☒ 3. Both I and II strengthen the statement.  
☒ 4. I weakens while II strengthens the statement.

- Q.19** To select multiple slides, press and hold the \_\_\_\_ key, and then click each slide.

**Ans** ☒ 1. Ctrl  
☒ 2. Home  
☒ 3. Shift  
☒ 4. Alt

- Q.20** If the resistance  $R$  is constant and the voltage  $V$  across a resistor is tripled, how does the power  $P$  change?

**Ans** ☒ 1. It decreases by three times.  
☒ 2. It increases by nine times.  
☒ 3. It increases by three times.  
☒ 4. It increases by one-third of its original.

- Q.21** Two resistors,  $R_1 = 10\ \Omega$  and  $R_2 = 20\ \Omega$ , are connected in series to a 12-V battery. What is the voltage across  $R_2$ ?

**Ans** ☒ 1. 16 V  
☒ 2. 8 V  
☒ 3. 12 V  
☒ 4. 4 V

- Q.22** 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 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 pair.)

**Ans** ☒ 1. ZS-JF  
☒ 2. EX-OK  
☒ 3. IB-PO  
☒ 4. MF-WS

- Q.23** Which of the given options can replace the question mark (?) in the following series to make it logically complete?

FHI 21 IKL 18 LNO 15 OQR 12 ?

**Ans** ☒ 1. RST 9  
☒ 2. RTU 10  
☒ 3. RTV 10  
☒ 4. RTU 9

**Q.24** According to Environment Performance Index (EPI) 2024, what was India's rank in greenhouse gas production in May 2024?

- Ans
- ☒ 1. 2<sup>nd</sup>
  - ☒ 2. 7<sup>th</sup>
  - ☒ 3. 3<sup>rd</sup>
  - ☒ 4. 11<sup>th</sup>

**Q.25** If the period  $T$  of a simple pendulum depends on its length  $L$ , mass  $m$  and acceleration due to gravity  $g$ , then using dimensional analysis, the period  $T$  is proportional to \_\_\_\_\_.

- Ans
- ☒ 1.  $\frac{L}{g}$
  - ☒ 2.  $\sqrt{\frac{L}{g}}$
  - ☒ 3.  $\frac{L}{\sqrt{g}}$
  - ☒ 4.  $\frac{mL}{g}$

**Q.26** In an isosceles  $\triangle ABC$ ,  $AC = BC$ , if each of the two equal angles of the third angle. Find the value of  $\left(\frac{2\angle C - 3\angle A + \angle B}{2}\right)$ .

- Ans
- ☒ 1. 60°
  - ☒ 2. 75°
  - ☒ 3. 35°
  - ☒ 4. 45°

**Q.27** If 'A' stands for '+', 'B' stands for 'x', 'C' stands for '+' and 'D' stands for '-', then what will come in place of the question mark (?) in the following equation?

$$15 \text{ D } 12 \text{ A } 6 \text{ C } 3 \text{ B } 7 = ?$$

- Ans
- ☒ 1. 33
  - ☒ 2. 34
  - ☒ 3. 32
  - ☒ 4. 31

**Q.28** In the following number-pairs, the second number is obtained by applying certain mathematical operations to the first number. Which numbers should replace X and Y so that the pattern followed by the two numbers on the left side of :: is same as that on the right side of ::?

(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 to 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed.)

$$X : 32 :: 18 : Y$$

- Ans
- ☒ 1. X=13, Y=30
  - ☒ 2. X=15, Y=37
  - ☒ 3. X=14, Y=35
  - ☒ 4. X=13, Y=37

**Q.29** Parallax error is an example of which type of error?

- Ans**
- ☐ 1. Instrumental error
  - ☐ 2. Random error
  - ☐ 3. Gross error
  - ☒ 4. Systematic error

**Q.30** The first and last terms of an A.P. are 36 and 46. If the sum of its terms is 574, then the number of terms will be?

- Ans**
- ☐ 1. 15
  - ☐ 2. 17
  - ☐ 3. 16
  - ☒ 4. 14

**Q.31** Which power-saving mode is most suitable for short breaks when you want to resume work quickly?

- Ans**
- ☐ 1. Shutdown
  - ☒ 2. Sleep
  - ☐ 3. Restart
  - ☐ 4. Hibernate

**Q.32** A particle is subjected to a variable force  $F(x)=6x$  N, where  $x$  is in metres. What is the work done in moving the particle from  $x=0$  m to  $x=3$  m?

- Ans**
- ☐ 1. 54 J
  - ☒ 2. 27 J
  - ☐ 3. 18 J
  - ☐ 4. 9 J

**Q.33** Which view allows you to organise the sequence of slides in your presentation in MS PowerPoint?

- Ans**
- ☐ 1. Normal View
  - ☒ 2. Slide Sorter View
  - ☐ 3. Slide Show
  - ☐ 4. Reading View

**Q.34** How can a computer virus affect a system's functionality?

- Ans**
- ☒ 1. By causing software to malfunction or crash
  - ☐ 2. By improving hardware performance
  - ☐ 3. By accelerating system boot time
  - ☐ 4. By optimizing system updates

**Q.35** Select the most appropriate options to fill in the blanks.  
The output voltage of L.V.D.T. transducer is practically \_\_\_\_\_ for displacements up to \_\_\_\_\_.

- Ans**
- ☐ 1. exponential; 50 mm
  - ☒ 2. linear; 5 mm
  - ☐ 3. exponential; 5 mm
  - ☐ 4. linear; 50 mm

**Q.36** A copper wire has resistance  $R$ . If its radius is reduced to half while keeping the length constant, what will be the new resistance?

- Ans
- ☒ 1.  $4R$
  - ☐ 2.  $16R$
  - ☐ 3.  $R$
  - ☐ 4.  $2R$

**Q.37** If the temperature of the surrounding medium increases, it will result in a/an \_\_\_\_ in the resistance of the thermistor and a/an \_\_\_\_ in the current.

- Ans
- ☐ 1. decrease; decrease
  - ☒ 2. decrease; increase
  - ☐ 3. increase; increase
  - ☐ 4. increase; decrease

**Q.38** Which of the following shortcuts is used to Split the document window?

- Ans
- ☐ 1.  $\text{Ctrl} + \text{Alt} + \text{C}$
  - ☒ 2.  $\text{Ctrl} + \text{Alt} + \text{S}$
  - ☐ 3.  $\text{Ctrl} + \text{Y}$
  - ☐ 4.  $\text{Alt} + \text{Shift} + \text{C}$

**Q.39** If  $X = \{a, b, c, d\}$  and  $Y = \{f, b, d, g\}$ , find  $X \cap Y$ .

- Ans
- ☒ 1.  $\{b, d\}$
  - ☐ 2.  $\{a, b, c, d, g, f\}$
  - ☐ 3.  $\{g, f\}$
  - ☐ 4.  $\{a, c\}$

**Q.40** Which of the following correctly expresses the relationship between power, force, time and distance?

- Ans
- ☐ 1.  $P = F \times t/d$
  - ☐ 2.  $P = F/d \times t$
  - ☒ 3.  $P = F \times d/t$
  - ☐ 4.  $P = F \times d \times t$

**Q.41** Evaluate:  $38 - 9 \div 6 \times 6$

- Ans
- ☐ 1. 27
  - ☐ 2. 32
  - ☒ 3. 29
  - ☐ 4. 28

**Q.42** If the angle of elevation of the sun changes from  $30^\circ$  to  $45^\circ$ , the length of the shadow of a pillar decreases by 80 m. The height of the pillar is:

- Ans
- ☐ 1.  $20(\sqrt{3} + 1)$  cm
  - ☐ 2.  $10(\sqrt{6} + 1)$  cm
  - ☐ 3.  $30(\sqrt{3} + 1)$  cm
  - ☒ 4.  $40(\sqrt{3} + 1)$  cm

**Q.43** Six people A, B, C, D, E and F live on six different floors of the same building. The bottom-most floor of the building is numbered as 1; the floor above it is numbered as 2 and so on. The topmost floor is numbered as 6. A lives on an even-numbered floor. Only three people live between A and B. F lives immediately above E. B does not live on floor number 2. Only two people live between F and D. F lives on an even-numbered floor. Who lives on floor number 3?

- Ans**
- ☐ 1. C
  - ☒ 2. E
  - ☐ 3. D
  - ☐ 4. B

**Q.44** When was the second war between the British army and Burma started?

- Ans**
- ☐ 1. 1885
  - ☐ 2. 1824
  - ☒ 3. 1852
  - ☐ 4. 1826

**Q.45** Which of the following statements are true about GPU?

- i. The full form of GPU is Graphical User Interface.
- ii. GPUs are made for the acceleration and enhancement of computer graphics and processed images.
- iii. The GPU exists as an electronic circuit that can be found on graphics card.
- iv. The GPU exists as a special electronic circuit that can be used in PCs and game consoles.

- Ans**
- ☐ 1. Only i, ii, and iv
  - ☐ 2. Only i, ii, and iii
  - ☒ 3. Only ii and iii
  - ☐ 4. i, ii, iii and iv

**Q.46** Select the most appropriate option to fill in the blank.

\_\_\_ error occurs as the value of flux density is different for the same value of current when increasing and decreasing.

- Ans**
- ☒ 1. Hysteresis
  - ☐ 2. Frequency
  - ☐ 3. Temperature
  - ☐ 4. Friction

**Q.47** In a class of 37 students, 25 like to play cricket and 16 like to play football. Also, each student likes to play at least one of the two games. How many students like to play both cricket and football ?

- Ans**
- ☐ 1. 3
  - ☐ 2. 5
  - ☐ 3. 6
  - ☒ 4. 4

**Q.48** In the following triad, each group of letters is related to the subsequent one following a certain logic. Select from the given options, the one that follows the same logic.

SALT - LSAT - TLAS  
MAID - IMAD - DIAM

- Ans**
- ☐ 1. LIFT - LFIT - TFIL
  - ☐ 2. MAIN - AMIN - NAIM
  - ☐ 3. BEAR - ABER - EARB
  - ☒ 4. KITE - TKIE - ETIK

**Q.49** In this question, a question is followed by two statements numbered (I) and (II). You have to decide whether the data provided in the statements are sufficient to answer the question. Read both the statements and decide the appropriate answer.  
Question: Six people sit in two parallel rows. In Row 1- A, B and C sit facing towards north and in Row 2 - P, Q and R sit facing the south. Each person in a row faces a person in the other row. Who sits at the right extreme end of Row 1?  
Statement (I): R sits to the immediate left of Q. Q faces A. B sits to the immediate left of A.

Statement (II): Only one person sits between B and C. B faces an immediate neighbour of Q.

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

**Q.50** Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statement(s).

**Statements:**

All roofs are sheds.  
No shed is a window.  
No shed is an door.

**Conclusions:**

(I) No roof is a window.  
(II) Some doors are windows.

- Ans**
- ☐ 1. Only conclusion (II) follows.
  - ☐ 2. Neither conclusion (I) nor (II) follows.
  - ☒ 3. Only conclusion (I) follows.
  - ☐ 4. Both conclusions (I) and (II) follow.

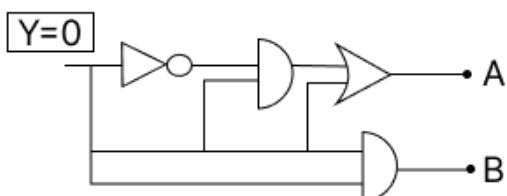
**Q.51** Which Article of the Indian Constitution provides for 'Right to work, to education and to public assistance in certain cases'?

- Ans**
- ☐ 1. Article 50
  - ☐ 2. Article 29
  - ☐ 3. Article 34
  - ☒ 4. Article 41

**Q.52** A 60-W lightbulb operates on a 120-V source. What is the current flowing through the bulb?

- Ans**
- ☒ 1. 2 A
  - ☒ 2. 1 A
  - ☒ 3. 1.5 A
  - ☒ 4. 0.5 A

**Q.53** In the given logic circuit, if the initial input is 0, then what will be the output of A and B, respectively?



- Ans**
- ☒ 1. 1, 1
  - ☒ 2. 0, 0
  - ☒ 3. 1, 0
  - ☒ 4. 0, 1

**Q.54** An infinitely long straight wire carries a current of  $I$ . At what distance  $r$  from the wire is the magnetic field  $5 \times 10^{-6}$  T if  $I = 15$  A?

- Ans**
- ☒ 1. 0.6 m
  - ☒ 2. 3 m
  - ☒ 3. 0.3 m
  - ☒ 4. 7.5 m

**Q.55** In a purely capacitive AC circuit, the power consumed over a complete cycle is \_\_\_\_\_.

- Ans**
- ☒ 1. zero
  - ☒ 2. maximum
  - ☒ 3. minimum but not zero
  - ☒ 4. equal to the apparent power

**Q.56** The basic principle behind the working of an electric motor is the interaction between the \_\_\_\_\_.

- Ans**
- ☒ 1. electric potential and light energy
  - ☒ 2. magnetic field and current-carrying conductors
  - ☒ 3. electric field and gravitational field
  - ☒ 4. magnetic field and heat energy

**Q.57** What action should be taken if an antivirus software detects a virus?

- Ans**
- ☒ 1. Follow the software's instructions to quarantine or remove the virus.
  - ☒ 2. Delete the infected files immediately.
  - ☒ 3. Ignore the warning and continue using the computer.
  - ☒ 4. Perform a system backup before taking any action.

Q.58 The point (9, 0), (9, 6), (-9, 6) and (-9, 0) are the vertices of a \_\_\_\_\_.

- Ans
- ☐ 1. square
  - ☒ 2. rectangle
  - ☐ 3. trepezium
  - ☐ 4. rhombus

Q.59 When performing the operation  $(1.23456 \times 10^3) + (1.234 \times 10^2)$ , how many significant figures should be reported in the result, assuming no rounding errors?

- Ans
- ☐ 1. 3
  - ☒ 2. 5
  - ☐ 3. 2
  - ☐ 4. 4

Q.60 In a certain code language, 'CARE' is coded as '6975' and 'RISK' is coded as '4386'. What is the code for 'R' in that language?

- Ans
- ☐ 1. 4
  - ☐ 2. 7
  - ☐ 3. 5
  - ☒ 4. 6

Q.61 What is the work done when a constant force of 20 N is applied at an angle of  $30^\circ$  to the direction of displacement of 13 m?

- Ans
- ☐ 1. 185 Joules
  - ☐ 2. 390 Joules
  - ☐ 3. 260 Joules
  - ☒ 4. 225 Joules

Q.62 Devendra Jhajharia is associated to which of the following games?

- Ans
- ☐ 1. Boxing
  - ☒ 2. Javelin throw
  - ☐ 3. Badminton
  - ☐ 4. Wrestling

Q.63 Select the most appropriate option to fill in the blanks.  
Repeatability is defined as the ability of an instrument to give the \_\_\_ output (with limited variations) for repeated applications of \_\_\_ input value under same environmental conditions.

- Ans
- ☐ 1. different; same
  - ☒ 2. same; same
  - ☐ 3. different; different
  - ☐ 4. same; different

Q.64 The long form of DAC and MAC is:

- Ans
- ☐ 1. Direct Access Control and Mandatory Access Control
  - ☐ 2. Discretionary Access Control and Multiple Access Control
  - ☐ 3. Direct Access Control and Multiple Access Control
  - ☒ 4. Discretionary Access Control and Mandatory Access Control

**Q.65** Which HTTP method is typically used to download a web page?

- Ans**
- ☐ 1. POST
  - ☐ 2. PUT
  - ☐ 3. DELETE
  - ☒ 4. GET

**Q.66** The distance between the points (0, 3) and (-3, 0) is :

- Ans**
- ☒ 1.  $3\sqrt{2}$  units
  - ☐ 2. 3 units
  - ☐ 3. 6 units
  - ☐ 4.  $2\sqrt{3}$  units

**Q.67** The mode and median of a data is 19.5 and 85, respectively. What is the mean of the data? (Use empirical formula.)

- Ans**
- ☒ 1. 117.8
  - ☐ 2. 118
  - ☐ 3. 119.1
  - ☐ 4. 118.6

**Q.68** In MS Word, what does the term 'font weight' refer to?

- Ans**
- ☐ 1. The colour of the font
  - ☒ 2. The thickness of the font
  - ☐ 3. The spacing between characters
  - ☐ 4. The style of the font

**Q.69** The areas of three adjacent faces of a solid cuboid are  $260 \text{ cm}^2$ ,  $104 \text{ cm}^2$  and  $10 \text{ cm}^2$ . What is the volume (in  $\text{cm}^3$ ) of the cuboid?

- Ans**
- ☐ 1. 627
  - ☐ 2. 782
  - ☒ 3. 520
  - ☐ 4. 524

**Q.70** Quantisation error of an 8-bit A/D converter for an analog voltage in the range -1 to +1 volt is approximately equal to \_\_\_\_ mv.

- Ans**
- ☐ 1. 0.4
  - ☐ 2. 0.3
  - ☒ 3. 2
  - ☐ 4. 0.1

**Q.71** A coin is thrown eight times. The probability of getting exactly five tails is:

- Ans**
- ☒ 1. 0.22
  - ☐ 2. 0.28
  - ☐ 3. 0.11
  - ☐ 4. 0.78

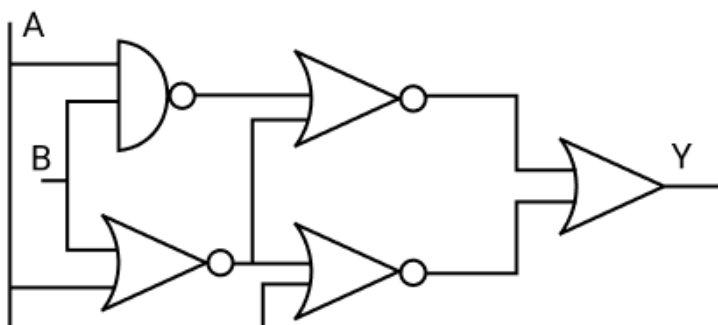
**Q.72** When you first open a spreadsheet software, what is usually displayed?

- Ans**
- ☐ 1. A blank document
  - ☐ 2. A blank page without any grids
  - ☒ 3. A blank spreadsheet with grids and cells
  - ☐ 4. A presentation slide

**Q.73** The shadow of an 8 m tall building is of length 6 m on the ground. Which of the following is the distance of the end point of the shadow from the top of the building?

- Ans
- ☒ 1. 12 m
  - ☒ 2. 6 m
  - ☒ 3. 9 m
  - ☒ 4. 10 m

**Q.74** Find the Boolean expression for the output Y if inputs are A and B.



- Ans
- ☒ 1. AB
  - ☒ 2. A+B
  - ☒ 3. B
  - ☒ 4. A

**Q.75** Which of the following platforms is primarily used for professional networking?

- Ans
- ☒ 1. Twitter
  - ☒ 2. Instagram
  - ☒ 3. Facebook
  - ☒ 4. LinkedIn

**Q.76** The magnetic field at a point near a long, straight current-carrying conductor is directly proportional to \_\_\_\_.

- Ans
- ☒ 1. the current through the conductor
  - ☒ 2. the inverse of the distance from the conductor
  - ☒ 3. the square of the distance from the conductor
  - ☒ 4. the square of the current

**Q.77** If a conductor moves through a uniform magnetic field, the induced potential difference is maximised when \_\_\_\_.

- Ans
- ☒ 1. the conductor is parallel to the magnetic field lines
  - ☒ 2. the conductor is perpendicular to the magnetic field lines
  - ☒ 3. the magnetic field is zero
  - ☒ 4. the magnetic field is non-uniform

**Q.78** Reproducibility is defined as the ability of an instrument to reproduce (the) \_\_\_\_ output(s) for repeated applications of (the) \_\_\_\_ input value(s) under (the) \_\_\_\_ environment condition(s).

- Ans
- ☒ 1. different; same; different
  - ☒ 2. same; same; same
  - ☒ 3. same; different; same
  - ☒ 4. same; same; different

**Q.79** In which of the following countries does the industrial sector contribute less towards the GDP?

- Ans**
- ☐ 1. Japan
  - ☐ 2. India
  - ☒ 3. Pakistan
  - ☐ 4. China

**Q.80** What is the estimated worth of the National Monetization Pipeline unveiled by the Government of India in September 2021?

- Ans**
- ☐ 1. ₹15 lakh crore
  - ☐ 2. ₹3 lakh crore
  - ☒ 3. ₹6 lakh crore
  - ☐ 4. ₹10 lakh crore

**Q.81** Intel 8051 provides \_\_\_\_ interrupt structures and 8052 provides \_\_\_\_ interrupt structures.

- Ans**
- ☐ 1. 4; 5
  - ☒ 2. 6; 7
  - ☐ 3. 7; 8
  - ☐ 4. 5; 6

**Q.82** The value of the discriminant of the quadratic equation  $7x^2 - 18x - 11 = 0$  is:

- Ans**
- ☐ 1. 619
  - ☐ 2. 616
  - ☐ 3. 638
  - ☒ 4. 632

**Q.83** The radius of a right circular cone is 2.1 cm and its height is 2.8 cm. The total surface area of the cone is: (Take  $\pi = 22/7$ )

- Ans**
- ☒ 1.  $36.96 \text{ cm}^2$
  - ☐ 2.  $23.1 \text{ cm}^2$
  - ☐ 3.  $18.48 \text{ cm}^2$
  - ☐ 4.  $46.2 \text{ cm}^2$

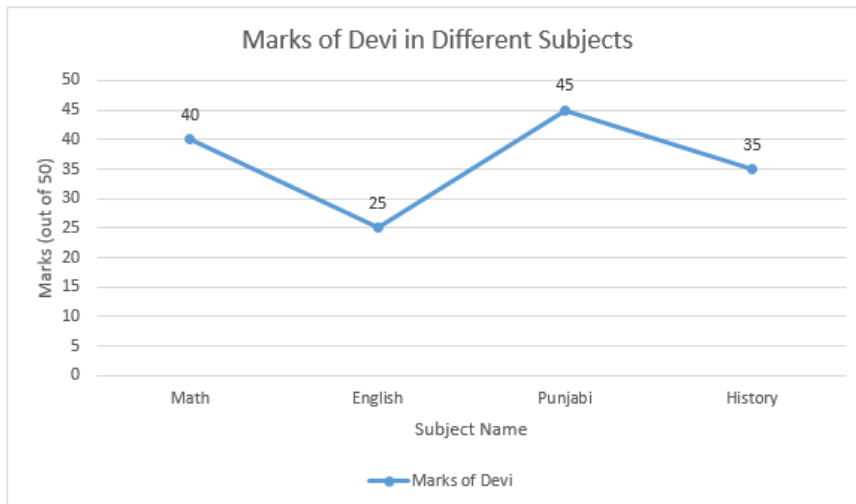
**Q.84** If the sum and product of the roots of a quadratic equation are  $\frac{11}{2}$  and  $\frac{15}{2}$ , respectively, then the equation whose roots are double the roots of the given equation is:

- Ans**
- ☐ 1.  $x^2 + 11x - 30 = 0$
  - ☒ 2.  $x^2 - 11x + 30 = 0$
  - ☐ 3.  $x^2 - 11x - 30 = 0$
  - ☐ 4.  $x^2 + 11x + 30 = 0$

**Q.85** If 8th and 12th terms of an A.P. be 82 and 478 respectively, then its 50th term is:

- Ans**
- ☐ 1. 4242
  - ☒ 2. 4240
  - ☐ 3. 4241
  - ☐ 4. 4238

**Q.86** Study the given graph and answer the question that follows.



The graph above depicts the marks of Devi in different subjects. What is her percentage of marks in Punjabi?

- Ans**
- ☐ 1. 80%
  - ☐ 2. 95%
  - ☐ 3. 85%
  - ☒ 4. 90%

**Q.87** Select the most appropriate option to fill in the blank.  
When the strain gauge-elastic member combination is used for weighing, it is called a \_\_\_\_\_.

- Ans**
- ☐ 1. Linear Variable Differential Transformer (L.V.D.T.)
  - ☐ 2. Capacitive transducer
  - ☐ 3. Piezoelectric transducer
  - ☒ 4. Load cell

**Q.88** Which of the following is the correct shortcut key to bring up the task manager directly using keyboard only?

- Ans**
- ☐ 1. Windows + R
  - ☐ 2. Ctrl + Windows + Enter
  - ☐ 3. Ctrl + Alt + Delete
  - ☒ 4. Ctrl + Shift + Escape

**Q.89** Which of the following behaviours aligns with netiquette guidelines?

- Ans**
- ☐ 1. Sending respectful and constructive emails
  - ☐ 2. Sharing properly cited information
  - ☐ 3. Ignoring others' opinions in online discussions
  - ☒ 4. Responding promptly to messages

**Q.90** What is the name of the new generation ballistic missile with a range of 1,000-2,000 km that was successfully flight tested at APJ Abdul Kalam Island in April 2024?

- Ans**
- ☐ 1. Surya
  - ☐ 2. Prahaar
  - ☐ 3. Akash
  - ☒ 4. Agni Prime

**Q.91** Which part of the Linux OS controls a computer's boot up process?

- Ans**
- ☒ 1. Bootloader
  - ☐ 2. Init system
  - ☐ 3. Daemons
  - ☐ 4. Kernel

**Q.92** Which of the following is NOT an input device?

- Ans**
- ☐ 1. Optical Character Reader (OCR)
  - ☐ 2. Mouse
  - ☐ 3. Digitizer
  - ☒ 4. Speaker

**Q.93** The area of the triangle ABC with the vertices A(-5, 7), B(-4, -5) and C(4, 5) is

- Ans**
- ☐ 1. 36 sq. units
  - ☒ 2. 53 sq. units
  - ☐ 3. 63 sq. units
  - ☐ 4. 35 sq. units

**Q.94** A wire loop is placed in a magnetic field that is increasing in magnitude but remains stationary. Using Fleming's Right-Hand Rule, what can be said about the induced current in the loop?

- Ans**
- ☒ 1. There is no induced current since the loop is stationary
  - ☐ 2. The current is induced clockwise
  - ☐ 3. The direction of the current depends on the material of the loop
  - ☐ 4. The current is induced counterclockwise

**Q.95** A 2 kg object is dropped from a height of 10 m. Assuming no air resistance, what will be the object's speed just before it hits the ground?

- Ans**
- ☐ 1. 25 m/s
  - ☐ 2. 20 m/s
  - ☐ 3. 10 m/s
  - ☒ 4. 14 m/s

**Q.96** What is the equivalent of 1 bar in the SI unit of pressure?

- Ans**
- ☐ 1.  $10^{-5}$  Pa
  - ☐ 2.  $10^6$  N/m<sup>2</sup>
  - ☐ 3.  $10^4$  psi
  - ☒ 4.  $10^5$  Pa

**Q.97** What should come in place of the question mark (?) in the given series?

1230 1232 1236 1242 1250 ?

- Ans**
- ☐ 1. 1264
  - ☐ 2. 1263
  - ☐ 3. 1262
  - ☒ 4. 1260

**Q.98** If the velocity  $v$  of a body is expressed as  $v = at + bt^2$ , where  $a$  and  $b$  are constants, the dimensions of  $b$  are \_\_\_\_\_.

- Ans**
- ✓ 1.  $[LT^{-3}]$
  - ✗ 2.  $[LT^{-1}]$
  - ✗ 3.  $[LT^{-2}]$
  - ✗ 4.  $[L]$

**Q.99** What is the purpose of setting a print area in a spreadsheet?

- Ans**
- ✗ 1. To highlight the area with colours
  - ✗ 2. To freeze rows and columns
  - ✗ 3. To adjust the font size
  - ✓ 4. To define the range of cells to be printed

**Q.100** Which of the following methods can be used to delete multiple columns simultaneously in Excel?

- Ans**
- ✗ 1. Use the "Find and Replace" feature
  - ✗ 2. Select the columns, then press the Delete key
  - ✓ 3. Select the columns, then right-click and press "Delete"
  - ✗ 4. Use the "Clear" option from the Home tab

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## रेल भर्ती बोर्ड / RAILWAY RECRUITMENT BOARDS

सी ई एन आर आर बी - ०२/२०२४ - CEN RRB - 02/2024



|                  |                                                                             |
|------------------|-----------------------------------------------------------------------------|
| Test Center Name | iON Digital Zone iDZ 3 Wadi MIDC Techgessor Soft Solutions Pvt. Ltd. Nagpur |
| Test Date        | 20/12/2024                                                                  |
| Test Time        | 9:00 AM - 10:30 AM                                                          |
| Subject          | RRB Technicians Grade I                                                     |

**\* 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 : RRB Technicians Grade I

**Q.1** In a survey of 260 students in a school, 100 were listed as taking apple juice, 150 as taking orange juice and 75 were listed as taking both apple as well as orange juice. Find how many students were taking neither apple juice nor orange juice.

- Ans
- ☒ 1. 75
  - ☒ 2. 65
  - ☒ 3. 95
  - ☒ 4. 85

**Q.2** A copper ring is dropped into a region with a constant magnetic field directed upwards. What happens to the ring according to Lenz's law?

- Ans
- ☒ 1. Its motion remains unaffected by the magnetic field.
  - ☒ 2. It is pushed upwards by the magnetic field.
  - ☒ 3. It accelerates downwards faster than in free fall.
  - ☒ 4. It slows down as it falls.

**Q.3** Study the given table and answer the question that follows.  
The given table depicts the percentage of marks scored by Mary and Perul in History and Physics (out of 75 each).

| Name  | History | Physics |
|-------|---------|---------|
| Mary  | 60      | 64      |
| Perul | 54      | 70      |

How many marks did Mary score in History?

- Ans
- ☒ 1. 53
  - ☒ 2. 45
  - ☒ 3. 47
  - ☒ 4. 37

**Q.4** Rishika accidentally presses CTRL + H in MS Word, and a dialog box is displayed. Which dialog box is it?

- Ans**
- ☐ 1. The Bullets and Numbering dialog box
  - ☒ 2. The Find and Replace dialog box
  - ☐ 3. The Header and Footer dialog box
  - ☐ 4. The Language dialog box

**Q.5** What does real-time protection in antivirus software do?

- Ans**
- ☐ 1. Creates a backup of important files
  - ☐ 2. Provides updates for new antivirus versions
  - ☒ 3. Continuously monitors and scans files for malware
  - ☐ 4. Scans files only when manually initiated

**Q.6** Which of the following materials are generally used for electrical transmission lines due to their low resistivity?

- Ans**
- ☒ 1. Copper and aluminium
  - ☐ 2. Gold and silver
  - ☐ 3. Lead and tin
  - ☐ 4. Tungsten and iron

**Q.7** In MS Word, which of the following is NOT an option provided in paragraph spacing of a document?

- Ans**
- ☐ 1. No paragraph space
  - ☐ 2. Compatible Spacing
  - ☐ 3. Compact
  - ☒ 4. Open

**Q.8** What should come in place of the question mark (?) in the given series?

708 718 729 741 754 ?

- Ans**
- ☐ 1. 766
  - ☐ 2. 767
  - ☒ 3. 768
  - ☐ 4. 765

**Q.9** In Microprocessor 8085 Address/Data buffer is a/an \_\_\_\_\_ buffer.

- Ans**
- ☒ 1. 8 bit and bi-directional
  - ☐ 2. 16 bit and bi-directional
  - ☐ 3. 8 bit and unidirectional
  - ☐ 4. 16 bit and unidirectional

**Q.10** From where was the concept of directive principles borrowed in the Constitution of India?

- Ans**
- ☒ 1. Irish Constitution
  - ☐ 2. French Constitution
  - ☐ 3. US Constitution
  - ☐ 4. Australian Constitution

**Q.11** The range of electrostatic voltmeter can be extended with the help of:

- Ans**
- ☒ 1. Resistance Potential Divider
  - ☐ 2. Capacitor
  - ☐ 3. Register
  - ☐ 4. Capacitance Potential Divider

**Q.12** A statement is given followed by two arguments. Decide which of the arguments is/are strong with respect to the statement.

**Statement:**

A minister of country X said, "Shifting to clean sources of energy has become an obvious choice in recent times."

**Arguments:**

I. Every year, country X has been witnessing more and more air pollution.

II. The prices for coal and natural gasses have increased significantly over the past years.

- Ans**
- ☒ 1. I weakens while II strengthens the statement.
  - ☒ 2. II weakens while I strengthens the statement.
  - ☒ 3. Both I and II strengthen the statement.
  - ☒ 4. Both I and II weaken the statement.

**Q.13** The area of a quadrilateral whose vertices are (3, 0), (4, 5), (-1, 4) and (-2,-1) taken in order, is:

- Ans**
- ☒ 1. 30 sq.units
  - ☒ 2. 12 sq.units
  - ☒ 3. 24 sq.units
  - ☒ 4. 48 sq.units

**Q.14** Select the set in which the numbers are related in the same way as are the numbers of the following sets.

(NOTE: Operations should be performed on the whole numbers, without breaking down the numbers into its constituent digits. E.g., 13 – Operations on 13 such as adding/deleting/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)

(19, 6, 17)

(79, 11, 42)

- Ans**
- ☒ 1. (14, 4, 2)
  - ☒ 2. (2, 6, 5)
  - ☒ 3. (15, 5, 6)
  - ☒ 4. (13, 49, 2)

**Q.15** If  $\alpha$  and  $\beta$  are the roots of the equation  $x^2 - 11x + 24 = 0$ , then what is the value of  $(\alpha^2 + \beta^2)$ ?

- Ans**
- ☒ 1. 80
  - ☒ 2. 73
  - ☒ 3. 64
  - ☒ 4. 75

**Q.16** Which feature in MS PowerPoint allows you to apply visual effects to slides or objects?

- Ans**
- ☒ 1. Designs
  - ☒ 2. Animations
  - ☒ 3. Transitions
  - ☒ 4. Layouts

**Q.17** A solid metallic sphere of radius 4 cm is melted and recast into 64 identical spheres. What is the ratio of the surface area of the original sphere to the total surface area of 5 smaller spheres so formed?

- Ans**
- ☒ 1. 14 : 5
  - ☒ 2. 32 : 3
  - ☒ 3. 16 : 5
  - ☒ 4. 16 : 15

**Q.18** Two similar triangles are  $\triangle ABC$  and  $\triangle LMN$ . If the area of  $\triangle ABC = 25 \text{ cm}^2$ , area of  $\triangle LMN = 36 \text{ cm}^2$  and  $BC = 2.5 \text{ cm}$ , then the measure of  $MN$  (in cm) is:

- Ans**
- ☐ 1. 4
  - ☐ 2. 1
  - ☐ 3. 2
  - ☒ 4. 3

**Q.19** Performance Grading Index, which is designed to catalyse transformational change in the field of school education, comprises of \_\_\_ indicators.

- Ans**
- ☐ 1. 50
  - ☐ 2. 90
  - ☒ 3. 70
  - ☐ 4. 100

**Q.20** What does PCB stand for?

- Ans**
- ☐ 1. Processor Control Board
  - ☒ 2. Printed Circuit Board
  - ☐ 3. Primary Circuit Board
  - ☐ 4. Power Control Board

**Q.21** A bag contains balls numbered from 1 to 42. One ball is drawn at random from these balls. The probability that its number is a multiple of 7 or 8 is:

- Ans**
- ☐ 1.  $\frac{22}{42}$
  - ☐ 2.  $\frac{13}{22}$
  - ☒ 3.  $\frac{11}{42}$
  - ☐ 4.  $\frac{11}{22}$

**Q.22** If 23rd and 24th terms of an A.P. be 42 and 312 respectively, then its 37th term is:

- Ans**
- ☒ 1. 3822
  - ☐ 2. 3821
  - ☐ 3. 3820
  - ☐ 4. 3823

**Q.23** Based on the English alphabetical order, three of the following four letter-clusters are alike in a certain way and thus form a group. Which letter-cluster 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**
- ☒ 1. QXEG
  - ☐ 2. JMTZ
  - ☐ 3. CFMS
  - ☐ 4. UXEK

Q.24 Simplify  $(\frac{1}{\sin^2 A} - 1)$ , where  $0 < A \leq 90^\circ$ .

- Ans ☒ 1.  $\tan^2 A$   
☐ 2.  $\cos^2 A$   
☐ 3.  $\sec^2 A$   
☐ 4.  $\cot^2 A$

Q.25 Microprocessor 8085 operates on clock cycle with \_\_\_\_ duty cycle.

- Ans ☒ 1. 50%  
☐ 2. 10%  
☐ 3. 25%  
☐ 4. 75%

Q.26 EDSP is related to NMBY in a certain way based on the English alphabetical order. In the same way, ONCZ is related to XWLI. To which of the following options is PODA related, following the same logic?

- Ans ☐ 1. YXMK  
☐ 2. YUIJ  
☒ 3. YXMJ  
☐ 4. YUTR

Q.27 If  $C = \{2, 4, 6, 8, 10, 12, 14, 16\}$ , and  $D = \{5, 10, 15, 20\}$ , then the number of elements in the set  $D - C$  is:

- Ans ☐ 1. 7  
☐ 2. 4  
☐ 3. 8  
☒ 4. 3

Q.28 The value of  $\sqrt{144} + \sqrt{0.0324} - \sqrt{6.76} =$

- Ans ☐ 1. 8.53  
☐ 2. 14.76  
☐ 3. 2.7  
☒ 4. 9.58

Q.29 Which of the following is NOT the member of microcontroller Intel 8051 series?

- Ans ☒ 1. 8044AH  
☐ 2. 80C51BH  
☐ 3. 80C31BH  
☐ 4. 87C51

Q.30 If  
'A + B' means 'A is the brother of B'  
'A - B' means 'A is the sister of B'  
'A × B' means 'A is the wife of B'  
'A ÷ B' means 'A is the father of B'  
'A @ B' means 'A is the son of B'  
If,  $K + M @ A \div F \times P \div L - T$ , then how is K related to T?

- Ans ☒ 1. Mother's brother  
☐ 2. Sister's mother  
☐ 3. Mother's father  
☐ 4. Mother's sister

**Q.31** What can be inferred about the magnetic field lines within a solenoid?

- Ans**
- ☐ 1. They are diverging
  - ☐ 2. They are circular
  - ☐ 3. They are in random directions
  - ☒ 4. They are in the form of parallel straight lines

**Q.32** Two resistors,  $R_1$  and  $R_2$ , are connected in series across a voltage source. If the power dissipated by  $R_1$  is 4 times the power dissipated by  $R_2$ , what is the ratio of their resistances  $R_1 : R_2$ ?

- Ans**
- ☐ 1. 1 : 16
  - ☐ 2. 16 : 1
  - ☒ 3. 4 : 1
  - ☐ 4. 1 : 4

**Q.33** Uday starts from Point Y and drives 16 km towards the North. He then takes a right turn, drives 28 km, turns right and drives 31 km. He then takes a right turn and drives 13 km. He takes a right turn and drives 41 km. He then turns left, drives 15 km, turns right and drives 8 km to stop at Point Z. How far (shortest distance) and towards which direction should he drive in order to reach Point Y again? (All turns are 90 degrees turns only unless specified)

- Ans**
- ☐ 1. 49 km towards East
  - ☐ 2. 25 km towards South
  - ☐ 3. 47 km towards North
  - ☒ 4. 34 km towards South

**Q.34** Which type of network topology is commonly used in Wide Area Networks (WANs)?

- Ans**
- ☒ 1. Mesh
  - ☐ 2. Star
  - ☐ 3. Bus
  - ☐ 4. Ring

**Q.35** Which of the following is the most widely used search engine globally?

- Ans**
- ☒ 1. Google
  - ☐ 2. DuckDuckGo
  - ☐ 3. Yahoo
  - ☐ 4. Bing

**Q.36** Which of the following terms will replace the question mark (?) in the given series to make it logically complete?  
IO19 KQ30 MS41 OU52 ?

- Ans**
- ☐ 1. QX63
  - ☐ 2. QX64
  - ☐ 3. QW64
  - ☒ 4. QW63

**Q.37** At 25°C, the barrier potential for germanium is approximately equal to:

- Ans**
- ☒ 1. 0.3 V
  - ☐ 2. 0.7 V
  - ☐ 3. 1.1 V
  - ☐ 4. 0.1 V

**Q.38** Which factor does NOT affect the resistivity of a material?

- Ans**
- ☐ 1. Atomic structure
  - ☐ 2. Material type
  - ☐ 3. Temperature
  - ☒ 4. Length of the conductor

**Q.39** Which tab would you use to add a new slide to your MS PowerPoint presentation?

- Ans**
- ☒ 1. Home
  - ☐ 2. Design
  - ☐ 3. Transitions
  - ☐ 4. Insert

**Q.40** If 'A' stands for '+', 'B' stands for 'x', 'C' stands for '-' and 'D' stands for '÷', then what will come in place of the question mark (?) in the following equation?

$$45 \text{ C } 30 \text{ A } 10 \text{ D } 7 \text{ B } 2 = ?$$

- Ans**
- ☐ 1. 33
  - ☐ 2. 31
  - ☒ 3. 34
  - ☐ 4. 32

**Q.41** Match the following social networking sites from Group A to the allowed characters in Group B.

**Group A** **Group B**

- I. Facebook A. Allowed up to 255 characters in the 'About' or bio field  
II. Instagram B. Allowed up to 150 characters in your bio field.  
III. LinkedIn C. Allowed up to 3,000 characters in your bio field.  
IV. Twitter D. It has a 160-character limit for the bio field.

- Ans**
- ☒ 1. I-A, II-B, III-C, IV-D
  - ☐ 2. I-D, II-C, III-B, IV-A
  - ☐ 3. I-C, II-D, III-A, IV-B
  - ☐ 4. I-B, II-A, III-D, IV-C

**Q.42** Evaluate:  $\frac{1}{\left(\frac{3}{4}\right) + \left(\frac{4}{6}\right)} \div \frac{2}{15}$

- Ans**
- ☐ 1.  $5\frac{2}{17}$
  - ☐ 2.  $5\frac{6}{17}$
  - ☐ 3.  $5\frac{4}{17}$
  - ☒ 4.  $5\frac{5}{17}$

**Q.43** The mode and median of a data is 26.7 and 71, respectively. What is the mean of the data? (Use empirical formula.)

- Ans**
- ☐ 1. 94.3
  - ☒ 2. 93.2
  - ☐ 3. 95.1
  - ☐ 4. 94.6

**Q.44** Each of members , P, Q, R, S, T, U and V, of a certain department has to attend a seminar on different days of the same week starting from Monday to Sunday. T has to attend the seminar immediately before P. Q has to attend the seminar on Tuesday. V has to attend the seminar on Sunday. Only U has to attend the seminar between P and R. S has to attend the seminar on one of the days before Q. Who has to attend the seminar on Monday?

- Ans**
- ☒ 1. S
  - ☐ 2. P
  - ☐ 3. T
  - ☐ 4. R

**Q.45** Which of the following statements is true regarding Lenz's Law?

- Ans**
- ☐ 1. The direction of the induced current depends on the amount of magnetic flux.
  - ☐ 2. Lenz's Law does not relate to electromagnetic induction.
  - ☒ 3. The induced current always opposes the change in magnetic flux that produced it.
  - ☐ 4. The induced current always assists the change in magnetic flux that produced it.

**Q.46** EMF of a thermocouple is approximately a \_\_\_\_ function of the temperature difference between the junctions.

- Ans**
- ☒ 1. linear
  - ☐ 2. parabolic
  - ☐ 3. hyperbolic
  - ☐ 4. exponential

**Q.47** The coordinates of a point A, where AB is the diameter of a circle whose centre is (2, -3) and B is (1, 4) is:

- Ans**
- ☐ 1. (-2, 10)
  - ☐ 2. (2, -10)
  - ☐ 3. (-3, 10)
  - ☒ 4. (3, -10)

**Q.48** In Faraday's experiment, if the magnetic flux through a loop increases linearly with time, the induced EMF is \_\_\_\_\_.

- Ans**
- ☐ 1. zero
  - ☐ 2. inversely proportional to time
  - ☐ 3. proportional to the square of time
  - ☒ 4. constant

**Q.49** Which of the following is the correct equation for power (P) in terms of energy (E) and time (t)?

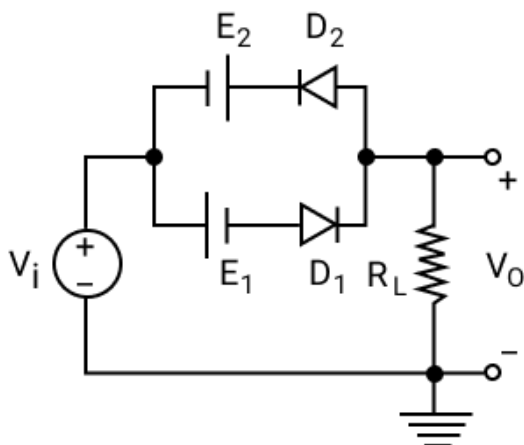
- Ans**
- ☐ 1.  $P = E + t$
  - ☐ 2.  $P = E \times t$
  - ☐ 3.  $P = E/t^2$
  - ☒ 4.  $P = E/t$

**Q.50** Calculate the maximum velocity of the beam of electrons in a CRT having a cathode anode voltage of 182 V. Assume that the electrons to leave the cathode with zero velocity.

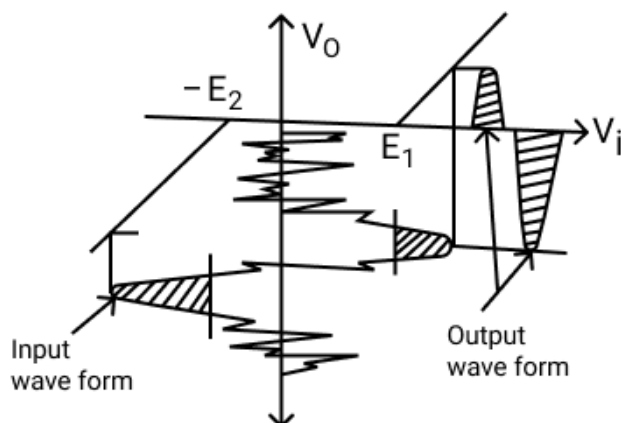
(Charge of electron =  $1.6 \times 10^{-19}$  C and mass of electron =  $9.1 \times 10^{-31}$  kg)

- Ans** ☒ 1.  $8 \times 10^6$  m/s  
☒ 2.  $1 \times 10^6$  m/s  
☒ 3.  $2 \times 10^6$  m/s  
☒ 4.  $4 \times 10^6$  m/s

**Q.51** In the given circuit, if the input voltage lies between  $+E_1$  and  $-E_2$ , then output is zero.



Input and output characteristics are shown below.



The region between  $+E_1$  and  $-E_2$  is known as \_\_\_\_.

- Ans** ☒ 1. dead zone  
☒ 2. active zone  
☒ 3. saturation zone  
☒ 4. cut off zone

**Q.52** Which state of India is at bottom according to Sustainable Development Goals (SDG) India Index, published by NITI Aayog in July 2024?

- Ans** ☒ 1. Tamil Nadu  
☒ 2. Kerala  
☒ 3. Haryana  
☒ 4. Bihar

**Q.53** What type of chart is used to compare parts of a whole in MS-Excel?

- Ans**
- ☒ 1. Pie Chart
  - ☐ 2. Line Chart
  - ☐ 3. Histogram
  - ☐ 4. Column Chart

**Q.54** In this question, a question is followed by two statements numbered (I) and (II). You have to decide whether the data provided in the statements are sufficient to answer the question. Read both the statements and decide the appropriate answer.  
Question: Five people A, B, C, D and E are sitting in a straight row, facing north. Who sits second to the right of A?

Statement (I): The number of people sitting to the right of A is equal to the number of people sitting to the left of A. One person sits between A and B. D sits to the immediate left of B.

Statement (II): E sits at the extreme left end of the row. Only one person sits between E and A. B sits to the immediate right of D.

- Ans**
- ☒ 1. Data in either statement I alone or statement II alone are sufficient to answer the question.
  - ☐ 2. Data in Statement I alone is sufficient to answer the question while data in statement II is not.
  - ☐ 3. Data in Statement II alone is sufficient to answer the question while data in statement I is not.
  - ☐ 4. Data in statements I and II together are sufficient to answer the question.

**Q.55** What is the power factor for a purely inductive or purely capacitive AC circuit?

- Ans**
- ☒ 1. 0
  - ☐ 2. 0.5
  - ☐ 3. 1
  - ☐ 4. -1

**Q.56** If  $\tan \theta = \frac{8}{15}$ , then the value of  $\frac{\sqrt{1 - \sin \theta}}{\sqrt{1 + \sin \theta}}$  is:

- Ans**
- ☐ 1.  $\frac{5}{7}$
  - ☐ 2.  $\frac{3}{4}$
  - ☐ 3.  $\frac{3}{7}$
  - ☒ 4.  $\frac{3}{5}$

**Q.57** India's latitudinal extent is:

- Ans**
- ☒ 1. 8°4' North to 37°6' North latitudes
  - ☐ 2. 4°8' South to 63°7' South latitudes
  - ☐ 3. 4°8' North to 63°7' North latitudes
  - ☐ 4. 8°4' South to 37°6' South latitudes

**Q.58** When does the force acting on a current-carrying conductor placed in a magnetic field become the largest?

- Ans**
- ☐ 1. When the direction of the current is parallel to the magnetic field
  - ☐ 2. When the direction of the current is opposite to the magnetic field
  - ☒ 3. When the direction of the current is at right angles to the magnetic field
  - ☐ 4. When the conductor is not moving

Q.59 \_\_\_\_\_ is the latest version of Windows Operating System.

- Ans
- ☐ 1. Windows Vista
  - ☐ 2. Windows 10
  - ☒ 3. Windows 11
  - ☐ 4. Windows 12

Q.60 P is the brother of Q. Q is the daughter of R. R is the husband of S. S is the sister of T. How is P related to T?

- Ans
- ☒ 1. Sister's son
  - ☐ 2. Son
  - ☐ 3. Brother
  - ☐ 4. Brother's son

Q.61 If three cards are drawn one by one randomly from a pack of 52 cards, then what is the probability that three of them are jack?

- Ans
- ☐ 1.  $\frac{3}{5525}$
  - ☐ 2.  $\frac{3}{552}$
  - ☒ 3.  $\frac{1}{5525}$
  - ☐ 4.  $\frac{4}{555}$

Q.62 From which tab of Task Manager can you end a non-responding application?

- Ans
- ☐ 1. Details
  - ☐ 2. Startup
  - ☐ 3. Services
  - ☒ 4. Processes

Q.63 If a body falls freely under gravity from rest, what fraction of its initial potential energy has been converted into kinetic energy when it has fallen to half of its initial height?

- Ans
- ☒ 1.  $\frac{1}{2}$
  - ☐ 2.  $\frac{3}{4}$
  - ☐ 3.  $\frac{7}{8}$
  - ☐ 4.  $\frac{1}{4}$

Q.64 Write the correct order of steps to print a webpage from your android phone.

1. On your Android device, open the Chrome app
2. Tap Print
3. At the top right, tap More Share.
4. Open the page, image, or file you want to print.
5. Select Print .
6. To change any print settings, tap the Down arrow
7. At the top, select a printer.

- Ans
- ☒ 1. 1, 4, 3, 5, 7, 6, 2
  - ☐ 2. 2, 4, 6, 1, 3, 5, 7
  - ☐ 3. 7, 6, 5, 4, 3, 2, 1
  - ☐ 4. 1, 2, 3, 4, 5, 6, 7

**Q.65** The smallest natural number which is divisible by 24, 6, 36 and 13 is:

- Ans**
- ☐ 1. 1008
  - ☒ 2. 936
  - ☐ 3. 1011
  - ☐ 4. 943

**Q.66** Which of the following actions will NOT help in reducing random errors?

- Ans**
- ☒ 1. Calibrating the instrument
  - ☐ 2. Taking readings under controlled conditions
  - ☐ 3. Increasing the number of observations
  - ☐ 4. Averaging multiple readings

**Q.67** In which year and city/cities India hosted the FIH Men's World Cup?

- Ans**
- ☒ 1. 2023 Bhubaneswar and Rourkela
  - ☐ 2. 2022 New Delhi
  - ☐ 3. 2024 Mumbai
  - ☐ 4. 2022 Lucknow

**Q.68** A car of mass  $m$  accelerates uniformly from rest under a constant force  $F$ . After traveling a distance  $d$ , what is the kinetic energy of the car?

- Ans**
- ☒ 1.  $F \times d$
  - ☐ 2.  $(F \times d)/2$
  - ☐ 3.  $2 \times F \times d$
  - ☐ 4.  $(F \times d)/m$

**Q.69** By default, if you're in a business environment, everyone within your organisation can edit the linked file. To change these permissions, click on the arrow at the right of the attachment name to display a drop-down menu with a variety of permission options. Which of the following is NOT a permission option?

- Ans**
- ☐ 1. Can View
  - ☐ 2. Can Edit
  - ☒ 3. Can ReView
  - ☐ 4. Can Delete

**Q.70** Which of the following is NOT a type of system software?

- Ans**
- ☐ 1. Utility software
  - ☒ 2. Microsoft Office
  - ☐ 3. Operating system
  - ☐ 4. Firmware software

**Q.71** When did the British Navy take over Rangoon in British India?

- Ans**
- ☐ 1. February 1826
  - ☐ 2. May 1822
  - ☒ 3. May 1824
  - ☐ 4. February 1813

**Q.72** Which of the following file formats can be used while saving a workbook in MS Excel 2019 that is compatible with all other spreadsheet software programs?

- Ans**
- ☒ 1. Comma-separated values (.csv)
  - ☐ 2. Microsoft Excel Spreadsheet Beta (.xlsb)
  - ☐ 3. Portable Document Format (.pdf)
  - ☐ 4. Microsoft Excel Spreadsheet XML (.xlsx)

**Q.73** Which of the following statements correctly describes the energy band diagram for conductors, semiconductors, and insulators?

- Ans**
- ☐ 1. Conductors have a wide forbidden gap, semiconductors have no forbidden gap, and insulators have a narrow-forbidden gap.
  - ☐ 2. Conductors have a wide forbidden gap, semiconductors have a narrow-forbidden gap, and insulators have no forbidden gap.
  - ☒ 3. Conductors have no forbidden gap, semiconductors have a narrow-forbidden gap, and insulators have a wide forbidden gap.
  - ☐ 4. Conductors have a narrow-forbidden gap, semiconductors have no forbidden gap, and insulators have a wide forbidden gap.

**Q.74** The first and last terms of an A.P. are 18 and 48. If the sum of its terms is 396, then the number of terms will be?

- Ans**
- ☐ 1. 9
  - ☒ 2. 12
  - ☐ 3. 15
  - ☐ 4. 10

**Q.75** Refer to the following word series and answer the question that follows.

CAB BIT YET AFT

In each of the words, each vowel is changed to the second letter following it in the English alphabetical order and each consonant is changed to the letter immediately preceding it in the English alphabetical order. In how many letter-clusters thus formed will NO vowel appear?

- Ans**
- ☐ 1. Four
  - ☐ 2. Three
  - ☐ 3. Two
  - ☒ 4. One

**Q.76** Which of the following is an example of high precision but low accuracy?

- Ans**
- ☐ 1. Scoring randomly on different parts of the target
  - ☐ 2. Hitting the centre of a target multiple times
  - ☒ 3. Hitting the same point far from the centre repeatedly
  - ☐ 4. Hitting different points on a target but near the centre

**Q.77** Which of the following statements for Piezoelectric transducer is correct?

- Ans**
- ☒ 1. Piezoelectric transducer can be used for the measurement of dynamic displacement only.
  - ☐ 2. Piezoelectric transducer cannot be used for the measurement of both static and dynamic displacement.
  - ☐ 3. Piezoelectric transducer can be used for the measurement of static displacement only.
  - ☐ 4. Piezoelectric transducer can be used for the measurement of both static and dynamic displacement.

**Q.78** Which factor does NOT affect the magnitude of motional EMF in a conductor?

- Ans**
- ☐ 1. The angle between the conductor's velocity and the magnetic field
  - ☐ 2. The length of the conductor
  - ☒ 3. The resistance of the conductor
  - ☐ 4. The speed of the conductor

**Q.79** A disturbance from the equilibrium exchange rate gives rise to automatic forces that push the exchange rate back towards the equilibrium level is known as the:

- Ans**
- ☐ 1. stable foreign exchange market
  - ☐ 2. elastic foreign exchange market
  - ☐ 3. unstable foreign exchange market
  - ☒ 4. fixed foreign exchange market

**Q.80** The magnetic field inside a long straight solenoid carrying current is \_\_\_\_\_.

- Ans**
- ☐ 1. non-uniform
  - ☐ 2. strongest at the ends
  - ☒ 3. uniform
  - ☐ 4. zero

**Q.81** The Gita is incorporated in the Mahabharata primarily to give an integrated view of \_\_\_\_\_.

- Ans**
- ☐ 1. universe
  - ☐ 2. happiness
  - ☐ 3. Moksha
  - ☒ 4. Dharma

**Q.82** Let  $C_1$  and  $C_2$  be two circles which do not externally touch and intersect each other and  $O_1$ , and  $O_2$  be the centers of the circles, respectively. Let AB be the common transverse tangent to the circles such that P, Q are the points of tangency respectively to  $C_1$ ,  $C_2$ . Let R be the point of intersection of  $O_1 O_2$  and AB. If  $\angle PO_1 R = 60^\circ$ , find  $\angle QO_2 R$  and  $\angle QRO_2$ , respectively.

- Ans**
- ☐ 1.  $45^\circ$  and  $45^\circ$
  - ☒ 2.  $60^\circ$  and  $30^\circ$
  - ☐ 3.  $20^\circ$  and  $70^\circ$
  - ☐ 4.  $40^\circ$  and  $50^\circ$

**Q.83** A particle of mass  $m$  starts from rest and moves with a constant acceleration  $a$  along a straight line. What is the relationship between the distance travelled  $x$  and the kinetic energy  $K$  of the particle?

- Ans**
- ☐ 1.  $K \propto x^2$
  - ☐ 2.  $K \propto \sqrt{x}$
  - ☒ 3.  $K \propto x$
  - ☐ 4.  $K \propto x^3$

**Q.84** When p-n junction diode is biased, which of the following statements is correct?

- Ans**
- ☐ 1. Depletion layer gets narrower only when diode is forward biased and remains constant when it is reverse biased.
  - ☒ 2. Depletion layer gets wider when it is reverse biased.
  - ☐ 3. Depletion layer gets narrower when it is reverse biased.
  - ☐ 4. Depletion layer gets wider only when diode is forward biased and remains constant when it is reverse biased.

**Q.85** A machine performs work  $W$  in time  $t$ , and its power output is  $P$ . If the machine's power output is doubled, how much time will it take to perform the same amount of work?

- Ans**
- ☒ 1.  $t/2$
  - ☐ 2.  $t/4$
  - ☐ 3.  $2t$
  - ☐ 4.  $t$

**Q.86** In the following number-pairs, the second number is obtained by applying certain mathematical operations to the first number. Which numbers should replace X and Y so that the pattern followed by the two numbers on the left side of :: is same as that on the right side of ::?

(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 to 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed.)

X : 130 :: 34 : Y

- Ans**
- ☐ 1. X=29, Y=185
  - ☐ 2. X=28, Y=190
  - ☒ 3. X=26, Y=170
  - ☐ 4. X=24, Y=160

**Q.87** Select the correct order of steps to add a textbox without using a mouse.

- i) When you are finished typing and want to switch back to editing text in your document, press Esc.
- ii) Press the arrow keys to select the text box that you want, and then press Enter.
- iii) Press and release Alt, N, and then press X.
- iv) Type the text that you want.

- Ans**
- ☐ 1. iv, iii, ii, i
  - ☐ 2. i, ii, iii, iv
  - ☒ 3. iii, ii, iv, i
  - ☐ 4. ii, iii, i, iv

**Q.88** In August 2024, Indian Council of Medical Research (ICMR) and Panacea Biotech announced the initiation of the first-ever Phase 3 clinical trial for which of the following vaccines in India?

- Ans**
- ☐ 1. Typhoid
  - ☐ 2. Malaria
  - ☒ 3. Dengue
  - ☐ 4. Hepatitis

**Q.89** A mass of 0.005 kg is measured using a scale with an uncertainty of 0.0001 kg. If the mass is used in a calculation where the uncertainty in derived quantity needs to be calculated, what is the maximum possible percentage uncertainty in the derived quantity if the quantity is proportional to  $m^2$ ?

- Ans**
- ☐ 1. 2%
  - ☐ 2. 10%
  - ☒ 3. 4%
  - ☐ 4. 0.1%

**Q.90** Convert decimal number 26.85 into binary equivalent.

- Ans**
- ☐ 1. 1001.111010
  - ☐ 2. 11001.110110
  - ☒ 3. 11010.110110
  - ☐ 4. 11010.101010

**Q.91** What happens if you enter a date that MS-Excel does NOT recognise?

- Ans**
- ☒ 1. MS-Excel treats it as a text.
  - ☐ 2. MS-Excel displays an error message.
  - ☐ 3. MS-Excel automatically corrects the format.
  - ☐ 4. MS-Excel deletes the content.

**Q.92** Which of the following malware symptoms indicate that your computer may be infected?

- I. Slow computer performance
- II. Erratic computer behaviour
- III. Unexplained data loss
- IV. Frequent computer crashes

- Ans**
- ☐ 1. I and II only
  - ☐ 2. II, III and IV only
  - ☐ 3. III and IV only
  - ☒ 4. I, II, III, and IV

**Q.93** The INF file processing functions provide setup and installation functionality that includes which of the following actions?

- 1. Opening and closing an INF file
- 2. Retrieving information about an INF file
- 3. Retrieving information about source files and target directories for copy operations
- 4. Performing the installation actions specified in an INF file section

- Ans**
- ☐ 1. 3 and 4 only
  - ☐ 2. 1, 2 and 3 only
  - ☒ 3. 1, 2, 3, and 4
  - ☐ 4. 1 and 2 only

**Q.94** Which of the following combinations represents a derived unit?

- Ans**
- ☐ 1. Metre, Kilogram, Ampere
  - ☐ 2. Metre, Second, Kilogram
  - ☐ 3. Kelvin, Mole, Ampere
  - ☒ 4. Volt, Newton, Joule

**Q.95** In a parallel circuit, if one of the resistors R1 is removed, the total resistance of the circuit will \_\_\_\_.

- Ans**
- ☐ 1. be zero
  - ☒ 2. increase
  - ☐ 3. decrease
  - ☐ 4. remain the same

**Q.96** The minimum value of  $8x + 14 + 3x^2$  is:

- Ans**
- ☐ 1.  $-\frac{28}{3}$
  - ☐ 2.  $-8\frac{2}{3}$
  - ☐ 3.  $\frac{28}{3}$
  - ☒ 4.  $8\frac{2}{3}$

**Q.97** Who among the following won the Vigyan Shri Award 2024?

- Ans**
- ☐ 1. Purabi Saikia
  - ☒ 2. Rohit Srivastava
  - ☐ 3. Vivek Polshettiwar
  - ☐ 4. Bappi Paul

**Q.98** In an intrinsic semiconductor, fermi energy level \_\_\_\_.

- Ans**
- ☐ 1. lies below the valance band
  - ☐ 2. in the middle of the conduction band
  - ☒ 3. lies mid-way between the conduction band and valance band
  - ☐ 4. lies above the conduction band

**Q.99** The area of the four walls of a room is  $780 \text{ m}^2$  and its length is twice its breadth. If the height of the room is 13m, then the area of its floor is equal to:

- Ans**
- ☐ 1.  $150 \text{ m}^2$
  - ☒ 2.  $200 \text{ m}^2$
  - ☐ 3.  $315 \text{ m}^2$
  - ☐ 4.  $295 \text{ m}^2$

**Q.100** Select the most appropriate option to fill in the blanks.  
A thermistor can have region of \_\_\_\_ determined by the construction material or the temperature of the material. The change in temperature can be due to internal effects such as current through the thermistor or due to external effects of \_\_\_\_.

- Ans**
- ☐ 1. negative temperature coefficients; cooling only
  - ☐ 2. positive or negative temperature coefficients; heating only
  - ☒ 3. positive or negative temperature coefficients; heating or cooling
  - ☐ 4. positive temperature coefficients; heating only

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