रेलवे भर्ती बोर्ड / RAILWAY RECRUITMENT BOARD
सीईएन ०२ /२०२५ - तकनीशियन ग्रेड I सिगनल और तकनीशियन ग्रेड III
CEN 02/2025 – Technician Grade I Signal and Technician Grade III

RRB TECHNICIAN GRADE I SIGNAL 2025

Technician Grade I Signal | CEN 02/2025

ENGLISH ANSWER KEY

Official Answer Key with Solutions

All 1 Shifts · 13-03-2026 to 13-03-2026

Questions	100
Marking	+1 correct / -1/3 wrong
Duration	90 minutes
Sections	Basic Science & Engineering 35 · Computers 20 · Maths 20 · Reasoning 15 · GA

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.

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Compiled 12 September 2026

INDEX · Click any row to open that paper

RRB Technician Grade I Signal 2025 (English) · 1 shifts

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सीईएन ०२ /२०२५ - तकनीशियन ग्रेड I सिगनल और तकनीशियन ग्रेड III
CEN 02/2025 – Technician Grade I Signal and Technician Grade III

Test Centre Name	iON Digital Zone iDZ Rungta
Test Date	13/03/2026
Test Time	9:00 AM - 10:30 AM
Subject	RRB Technician Grade I Signal

*** 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 : **General Awareness**

Q.1 **Which folk music tradition from West Bengal, associated with spiritual themes, is performed by wandering minstrels?**

Ans
✗ 1. Baul
✗ 2. Pandavani
✗ 3. Bhavai
✓ 4. Alha

Q.2 **Shri C. P. Radhakrishnan was sworn in as ____ Vice President of India.**

Ans
✓ 1. 15th
✗ 2. 13th
✗ 3. 12th
✗ 4. 14th

Q.3 **The Constitution of India prohibits which of the following types of citizenship?**

Ans
✗ 1. Dual citizenship of another country along with Indian citizenship
✗ 2. Citizenship by naturalisation after fulfilling prescribed conditions
✗ 3. Citizenship by registration under statutory provisions
✓ 4. Citizenship by birth within the territory of India

Q.4 **When and where did the first session of the Indian National Congress take place?**

Ans
✓ 1. December 28, 1852, Poona
✗ 2. December 28, 1885, Bombay
✗ 3. January 12, 1885, Calcutta
✗ 4. December 28, 1885, Poona

Q.5 **The Kol Uprising, which resisted British law and order intervention, took place in which region?**

Ans
✗ 1. Bengal
✗ 2. Mysore
✓ 3. Awadh
✗ 4. Chotanagpur

Q.6 **In 2025, which Indian cricketer became the first Indian pacer to play 50 Test matches for the country?**

Ans
- ✗ 1. Bhuvneshwar Kumar
- ✗ 2. Jasprit Bumrah
- ✗ 3. Ishant Sharma
- ✓ 4. Mohammed Shami

Q.7 **Which of the following was NOT a key component of the 1991 industrial reforms in India?**

Ans
- ✗ 1. Abolition of the Monopolies and Restrictive Trade Practices (MRTP) Act
- ✗ 2. Encouraging Foreign Direct Investment (FDI)
- ✗ 3. Expansion of the public sector in key industries
- ✓ 4. Delicensing of industries

Q.8 **As per Article 280(1) of the Constitution, the Finance Commission is to be constituted:**

Ans
- ✓ 1. Every three years
- ✗ 2. Every four years or earlier
- ✗ 3. Every seven years or earlier
- ✗ 4. Every five years or earlier

Q.9 **Pandit Chhannulal Mishra, who passed away at the age of 89, was associated with which of the following Hindustani classical music gharanas?**

Ans
- ✗ 1. Agra Gharana
- ✗ 2. Jaipur-Atrauli Gharana
- ✓ 3. Gwalior Gharana
- ✗ 4. Banaras Gharana

Q.10 **Which of the following pairs of peaks and their approximate heights is matched INCORRECTLY?**

Ans
- ✓ 1. Anaimudi - 2695 m
- ✗ 2. Kanchenjunga - 8598 m
- ✗ 3. Dodabetta - 2637 m
- ✗ 4. Nanga Parbat - 7026 m

Section : **General Intelligence and Reasoning**

Q.11 **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. MHJ
- ✗ 2. TOQ
- ✓ 3. RMO
- ✗ 4. KEH

Q.12 **Refer to the following number and symbol series and answer the question that follows. Counting to be done from left to right only.**

(Left) 1 3 € £ 7 4 6 ¥ 2 8 $ 6 3 1 ◇ 1 3 9 ○ 2 5 ☆7 5 9 (Right)

How many such symbols are there that are immediately preceded by an odd number but not immediately followed by an even number?

Ans
- ✗ 1. One
- ✗ 2. Three
- ✓ 3. Four
- ✗ 4. Two

Q.13 **Refer to the following number and symbol series and answer the question that follows. Counting to be done from left to right only. All numbers are single-digit numbers.**

(Left) 9 1 @ $ 5 1 # 5 9 $ 1 & 4 + 7 = ! 5 & 4 ? (Right)

How many such symbols are there each of which is immediately preceded by a number and also immediately followed by another number?

Ans
- ✓ 1. THREE
- ✗ 2. FIVE
- ✗ 3. FOUR
- ✗ 4. SIX

Q.14 **Vijay starts from point A and drives 10 km towards North. He then takes a left turn, drives 4 km, turns left and drives 12 km. He then takes a left turn and drives 9 km. He takes a final left turn, drives 2 km and stops at point P. How far (shortest distance) and towards which direction should he drive in order to reach point A again? (All turns are 90 degrees turns only unless specified)**

Ans
- ✗ 1. 4 km to the east
- ✗ 2. 4 km to the west
- ✓ 3. 5 km to the west
- ✗ 4. 5 km to the east

Q.15 **In a certain code language,**

A + B means 'A is the son of B',
A – B means 'A is the brother of B',
A x B means 'A is the wife of B', and
A ÷ B means 'A is the father of B'.

Based on the above, how is L related to P if 'L + M ÷ N x O – P'?

Ans
- ✗ 1. Wife's father
- ✗ 2. Brother's wife's father
- ✓ 3. Brother's wife's brother
- ✗ 4. Wife's brother

Q.16 **Seven people, C, D, E, F, W, X and Y, are sitting around a circular table facing the centre of the table. Only two people sit between C and D when counted from the left of D. X sits to the immediate right of D. Only three people sit between D and E. F sits to the immediate right of W. How many people sit between Y and F when counted from the right of F?**

Ans
- ✗ 1. One
- ✓ 2. Two
- ✗ 3. Three
- ✗ 4. Zero

Q.17 **Refer to the given letter, number and symbol series and answer the question that follows. Counting to be done from left to right only.**

(Left) F 5 @ £ T 7 Y € V D © 3 € 6 % X 1 Z £ € G * (Right)

If all the numbers are dropped from the series, which of the following will be sixth from the left?

Ans
✗ 1. £
✗ 2. T
✓ 3. €
✗ 4. Y

Q.18 **10 is related to 22 following a certain logic. Following the same logic, 24 is related to 50. To which of the given options is 6 related, following the same logic?**
(NOTE: Operations should be performed on the whole numbers, without breaking down the numbers into their constituent digits. E.g. 13 – Operations on 13 such as adding to/subtracting from/multiplying with 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed.)

Ans
✓ 1. 12
✗ 2. 18
✗ 3. 16
✗ 4. 14

Q.19 **What will come in the place of '?' in the following equation, if '+' and '-' are interchanged and 'x' and '÷' are interchanged?**

297 x 11 - 17 ÷ 18 + 91 =?

Ans
✗ 1. 245
✗ 2. 248
✗ 3. 242
✓ 4. 240

Q.20 **Select the triad which follows the same pattern as that followed by the two triads given below. Both triads follow the same pattern.**

HN-JF-MO
MS-OK-RT

Ans
✗ 1. OU-SM-WY
✓ 2. PV-RN-UW
✗ 3. PV-SN-UY
✗ 4. PU-SN-WY

Q.21 **A question is followed by two statements numbered I and II. You have to decide whether the data provided in the statements are sufficient to answer the question. Read both the statements and select the most appropriate answer.**

Six people, A, B, C, D, E and F, are sitting in a straight line, facing north. Who sits to the immediate left of E?
I. B sits fourth to the right of C. Only one person sits between C and F. D sits third to the right of F.
II. C sits at the extreme left end of the line. Only two people sit between C and E. A sits fourth to the left of D.

Ans
✗ 1. The data in both Statements I and II put together (and not independently) are sufficient to answer the question.
✓ 2. The data in Statement I alone is sufficient to answer the question while data in Statement II is not.
✗ 3. The data in Statement II alone is sufficient to answer the question while data in Statement I is not.
✗ 4. The data in both Statements I and II put together are NOT sufficient to answer the question.

Q.22 **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 which follows the same logic.**
MAKE – MEKA – AEMK
LOAD – LDAO - ODLA

Ans
✗ 1. RENT – RTEN – ENRT
✗ 2. WIND – WDNI – IDWN
✗ 3. VIEW – WVIE – EWIV
✓ 4. GROW – ROWG – ORGW

Q.23 **19 is related to 64 following a certain logic. Following the same logic, 28 is related to 91. To which of the following is 44 related, following the same logic?**

(NOTE: Operations should be performed on the whole numbers, without breaking down the numbers into their constituent digits. E.g. 13 – Operations on 13 such as adding / subtracting / multiplying etc. to 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed.)

Ans
✗ 1. 113
✓ 2. 131
✗ 3. 139
✗ 4. 193

Q.24 **LF 58 is related to ID 49 in a certain way. In the same way, YK 36 is related to VI 27. To which of the following is RO 61 related, following the same logic?**

Ans
✗ 1. OM 52
✗ 2. OG 55
✗ 3. OH 59
✓ 4. OV 53

Q.25 **Each of M, N, O, P, Q, R and S plays a game on a different day of a week starting from Monday and ending on Sunday of the same week. M plays the game on Wednesday. Only two persons play the games between M and Q. O plays the game on the day immediately before R but not on Thursday. Only two persons play the games between N and S. N does not play the game on the last day. On which day does P play the game?**

Ans
✗ 1. Friday
✓ 2. Monday
✗ 3. Thursday
✗ 4. Tuesday

Section : **Basics of Computers and Application**

Q.26 **Which of the following best describes the role of PCB in a computer system?**

Ans
✗ 1. A physical board connecting electronic components
✓ 2. A software tool for virus removal
✗ 3. An input device for transferring data
✗ 4. A protocol used in wireless networks

Q.27 **What is the difference between Reply and Forward in email?**

Ans
✓ 1. Reply sends your response only to the original sender, while Forward sends the email to a new recipient.
✗ 2. Reply deletes the original message, while Forward saves it.
✗ 3. Reply sends the email to all contacts, Forward sends it to none.
✗ 4. Reply encrypts the email, Forward does not.

Q.28 **In a switched Ethernet LAN, which switching method begins forwarding a frame as soon as the destination MAC address is read, resulting in the lowest latency but higher risk of forwarding corrupted frames?**

Ans
✗ 1. Token Passing
✓ 2. Store-and-Forward Switching
✗ 3. Cut-Through Switching
✗ 4. Fragment-Free Switching

Q.29 **Consider the following statements regarding inserting and deleting rows and columns in tables in MS Word 2021:**
New rows can be inserted only at the end of a table using the Tab key.
The Layout tab under Table Tools allows users to insert or delete rows and columns at any position within the table.
The Right-click context menu provides quick options for inserting and deleting rows or columns.
Which of the above statements is/are correct?

Ans
✗ 1. Statement 1, Statement 2, and Statement 3
✗ 2. Statement Only 2 and Statement 3
✓ 3. Statement Only 1 and Statement 2
✗ 4. Statement Only 1 and Statement 3

Q.30 **In R1C1 reference style, how is the cell located at column E and row 8 represented in Microsoft Excel 2021?**

Ans
✗ 1. R8C5
✓ 2. 8R5C
✗ 3. 8RC5
✗ 4. RC85

Q.31 **Where can you find options to change the design template of your presentation?**

Ans
✗ 1. Insert tab
✓ 2. Home tab
✗ 3. View tab
✗ 4. Design tab

Q.32 **You have a large, comma-separated data set pasted into Word, where each line represents a new row and the commas (,) separate the data that should occupy individual cells. To accurately convert this text into a table while ensuring the data is parsed correctly, which sequence of actions must you take while using MS Word in Microsoft 365?**

Ans
✗ 1. Select the entire text, open the Table Properties dialog box, navigate to the Row tab, and specify a fixed row height, which automatically triggers the conversion.
✓ 2. Select the entire text, go to the Insert tab, click Table, and select Quick Tables, then choose the appropriate style.
✗ 3. Select the entire text, go to the Insert tab, click Table, and select Convert Text to Table, then confirm that the separator character is set to Commas.
✗ 4. Select the entire text, go to the Layout tab (under Table Tools), select Text Direction, and choose the Convert Text to Table option.

Q.33 **Clip art includes:**

Ans
✓ 1. Sound files
✗ 2. Only charts
✗ 3. Animated GIFs & drawings
✗ 4. Only videos

Q.34 **An email containing sensitive information is received from a client. It needs to be forwarded to a colleague for further action. What measures should be taken to safeguard the sensitive information during this process?**

Ans
✗ 1. Call your colleague and verbally share the sensitive information.
✓ 2. Forward the email as is.
✗ 3. Redact the sensitive information before forwarding.
✗ 4. Delete the mail containing sensitive information

Q.35 **Which of the following statements about Power Saving Mode in MS Word is TRUE?**

Ans
✗ 1. Power Saving Mode in Word automatically converts all documents to plain text to save energy.
✓ 2. MS Word has a dedicated "Power Saving Mode" that reduces CPU usage and disables editing features
✗ 3. MS Word automatically adjusts performance and reduces background operations when the computer's power-saving mode is enabled
✗ 4. Enabling Power Saving Mode in Word disables printing and spell-checking permanently

Q.36 **In MS PowerPoint, which feature enables inserting tables from MS Word or MS Excel?**

Ans
✗ 1. Insert > Table
✗ 2. File > Import
✗ 3. Insert > Object
✓ 4. Home > Table

Q.37 **Windows comes with a _____ that displays currently opened programs. It also allows users to access any specific programs.**

Ans
✗ 1. start menu
✓ 2. task manager
✗ 3. taskbar
✗ 4. file explorer

Q.38 **The system software component ____ is responsible for booting up the computer system.**

Ans
✓ 1. CGI/ETF
✗ 2. CLI/GUI
✗ 3. BIOS/UEFI
✗ 4. HDMI/VGA

Q.39 **Which of the following is a correct combination of commonly used Internet services and their primary functions?**

Ans
✗ 1. Email – remote access; WWW – file encryption; FTP – managing hardware drivers
✗ 2. FTP – transferring files; VoIP – voice communication; Email – sending and receiving messages
✗ 3. WWW – file transfer; Email – real-time video calling; Telnet – sending photos
✓ 4. FTP – browsing websites; Email – live chatting; VoIP – printing files

Q.40 **Which shortcut allows you to select an entire sentence in MS Word 365 without dragging the mouse?**

Ans
✗ 1. Ctrl + Click anywhere in the sentence
✓ 2. Ctrl + Shift + →
✗ 3. Ctrl + Shift + End
✗ 4. Ctrl + Click

Q.41 **In MS Excel, which option allows you to insert a new column between column B and C?**

Ans
- ✗ 1. Select Column C → Press Delete
- ✗ 2. Use "Clear Contents" option
- ✗ 3. Right-click on Column B header → Delete
- ✓ 4. Right-click on Column C header → Insert

Q.42 **What shortcut key is used in Windows OS to navigate between open programs?**

Ans
- ✗ 1. Alt + Ins
- ✗ 2. Alt + F4
- ✗ 3. Alt + Del
- ✓ 4. Alt + Tab

Q.43 **How can a user attach a file to an e-mail in most e-mail clients?**

Ans
- ✗ 1. Go to the Edit menu and select 'Add File'
- ✓ 2. Click the 'Send' button and select a file
- ✗ 3. Click the 'Attach File' or paperclip icon and select a file
- ✗ 4. Press Ctrl + A to attach a file

Q.44 **Which toolbar in Excel or Office applications allows you to draw shapes, arrows, and flowchart elements?**

Ans
- ✗ 1. Standard Toolbar
- ✓ 2. Formatting Toolbar
- ✗ 3. Drawing Toolbar
- ✗ 4. Formula Toolbar

Q.45 **What factors should be considered for optimal document printing results?**

Ans
- ✗ 1. Printer selection, paper type, print quality, color options, and page range settings affect printing outcomes and resource efficiency.
- ✗ 2. Default printing settings are always appropriate.
- ✓ 3. All documents print identically regardless of settings.
- ✗ 4. Printing settings have no impact on final results.

Section : **Mathematics**

Q.46 **The number of elements in the Power set P(S) of the set S = {1, 2, 3, 4, 5, 6 ,7, 8} is:**

Ans
- ✗ 1. 258
- ✗ 2. 247
- ✗ 3. 250
- ✓ 4. 256

Q.47 **The following table represents the marks obtained by six students in an aptitude test. Study the data carefully and answer the questions given below by matching the following types.**

Student	A	B	C	D	E	F
Marks	48	50	52	55	60	65

Match the following (standard deviation values are rounded off to two decimal places):

A. Standard deviation of entire dataset — I. 5.88

B. Standard deviation of only the middle four values (B, C, D, E) — II. 3.77

C. Standard deviation of only first three values (A, B, C) — III. 4.08

D. Standard deviation of only last three values (D, E, F) — IV. 1.63

Ans

✗ 1. A – II, B – IV, C – I, D – III

✓ 2. A – I, B – II, C – III, D – IV

✗ 3. A – II, B – IV, C – III, D –I

✗ 4. A – I, B – II, C – IV, D – III

Q.48 **The coordinates of the centroid of the triangle ABC whose vertices are A(-16, 13), B(-2, -9) and C(2, 13), is**

Ans

✗ 1. $\left(-\frac{16}{3}, \frac{15}{3}\right)$

✓ 2. $\left(-\frac{16}{3}, \frac{17}{3}\right)$

✗ 3. $\left(-\frac{17}{3}, \frac{17}{3}\right)$

✗ 4. $\left(-\frac{14}{3}, \frac{18}{3}\right)$

Q.49 A hemispherical bowl has $\frac{992\pi}{3}$ cm^3 of water in it. If a ball of radius the water level is raised up to the height of the bowl without any extra What is the radius of the bowl?

Ans

✗ 1. 8 cm

✗ 2. 6 cm

✓ 3. 2 cm

✗ 4. 4 cm

Q.50 **A cylindrical pillar is 28 cm in diameter and 25 m in height. Find the cost of painting the curved surface of the pillar at the rate of ₹50 per m^2.**

$(\text{Use } \pi = \frac{22}{7})$

Ans

✓ 1. ₹1100

✗ 2. ₹1072

✗ 3. ₹1138

✗ 4. ₹1080

Q.51 Find the coordinates of a point P on the x-axis which is equidistant from the points A(2,3) and B(–4,5).

Ans

✔ 1. $(3,0)$

✘ 2. $(\frac{1}{4}, 0)$

✘ 3. $(-\frac{7}{3}, 0)$

✘ 4. $(-7,0)$

Q.52 If the roots of the equation $x^2 - 5x + 6 = 0$ are α and β, find the value

Ans

✘ 1. 12

✘ 2. 6

✔ 3. 5

✘ 4. 13

Q.53 If the sum of the 8th and the 12th terms of an AP is 100, and the 20th term is 95, then what is the 7th term?

Ans

✔ 1. 36.5

✘ 2. 38.5

✘ 3. 39.5

✘ 4. 37.5

Q.54 The angles of a triangle are $(2x+5)^\circ$, x° and $(3x-17)^\circ$. Find the va of x.

Ans

✘ 1. 48

✘ 2. 32

✔ 3. 24

✘ 4. 40

Q.55 If a = 18 and d = 30, then sum of first 6 terms of the A.P. is?

Ans

✘ 1. 555

✔ 2. 558

✘ 3. 561

✘ 4. 559

Q.56 A kite is flying in the sky. A person is holding the kite with 40 m long tightly stretched string. Find the height of the kite (in meters) if the angle made by the string with the horizontal is 30 degrees.

Ans

✘ 1. 15

✘ 2. 10

✔ 3. 30

✘ 4. 20

Q.57 In a test, Chris has to answer two questions. The probability that he will answer the first question correctly is $\frac{1}{5}$. If he answers the first question correctly, the probability that he will answer the second question correctly is $\frac{5}{6}$. If Chris does not answer the first question correctly, the probability that he will answer the second question correctly is $\frac{1}{4}$. Find the probability that Chris will answer the second question INCORRECTLY.

[Note: Assume that each question will be answered— either correctly or incorrectly.]

Ans

✔ 1. $\frac{19}{30}$

✘ 2. $\frac{7}{10}$

✘ 3. $\frac{3}{5}$

✘ 4. $\frac{2}{3}$

Q.58 Simplify: $[\{\sin^8\theta - \cos^8\theta\}\frac{1}{\sin^4\theta + \cos^4\theta}] + 2\cos^2\theta$

Ans

✘ 1. 1

✘ 2. 0

✘ 3. 2

✔ 4. −1

Q.59 **The HCF of two numbers, each having three digits, is 19 and their LCM is 760. The number of such pairs is:**

Ans

✔ 1. 0

✘ 2. 1

✘ 3. 2

✘ 4. 3

Q.60 **Simplify (2.5 × 0.48 ÷ 0.6) + (3.5 + 1.6 ÷ 0.8) − (4.8 × 0.25 ÷ 0.8).**

Ans

✘ 1. 7

✔ 2. 5

✘ 3. 8

✘ 4. 6

Q.61 **Find the product of all the possible values of 'a' for $a^2x^2 + a^{3/2}x + 3 = 0$ to be a quadratic equation with discriminant 28a.**

Ans

✘ 1. 14

✘ 2. -12

✔ 3. -28

✘ 4. 0

Q.62 **If X and Y are two sets such that X ∪ Y has 56 elements, X has 45 elements and Y has 33 elements, how many elements does X ∩ Y have ?**

Ans

✘ 1. 25

✘ 2. 13

✔ 3. 22

✘ 4. 19

Q.63 Given that $112^{0.17} = x$, $112^{0.94} = y$ and $x^z = y^6$, then the value of z is close to:

Ans
- ✗ 1. 32.2
- ✗ 2. 34.19
- ✓ 3. 33.18
- ✗ 4. 34.73

Q.64 If E and F are two mutually exclusive events such that $P(E) = \frac{1}{6}$ and $P(F) = \frac{1}{2}$, then find the P(not E and not F).

Ans
- ✗ 1. $\frac{1}{3}$
- ✓ 2. $\frac{2}{3}$
- ✗ 3. $\frac{1}{2}$
- ✗ 4. $\frac{5}{6}$

Q.65 Triangle ABC is similar to triangle PQR. AM and PS are altitudes and AN and PT are medians. If $\frac{AM}{PS} = \frac{3}{5}$, the area of triangle PQR is 150 cm^2 and BC = 6 cm, then the sum of the lengths of AM and QR is:

Ans
- ✗ 1. 28 cm
- ✗ 2. 38 cm
- ✓ 3. 36 cm
- ✗ 4. 24 cm

Section : **Basic Science and Engineering**

Q.66 **Magnetic flux depends on :**

Ans
- ✗ 1. Only angle
- ✗ 2. Area, magnitude of B and its orientation
- ✓ 3. Only magnetic field
- ✗ 4. Only area

Q.67 **A resistor of 10 Ω is connected to a constant voltage source. When another resistor is connected in series with it, the current in the circuit becomes half of its initial value. Assuming the supply voltage remains unchanged, the resistance of the second resistor is _____.**

Ans
- ✗ 1. 10 Ω
- ✗ 2. 15 Ω
- ✗ 3. 20 Ω
- ✓ 4. 5 Ω

Q.68 **If a charge of 3 C is moved across a potential difference of 15 V in 3 seconds, what is the power developed in the process?**

Ans
- ✗ 1. 30 W
- ✗ 2. 10 W
- ✓ 3. 5 W
- ✗ 4. 15 W

Q.69 **An ideal half-wave rectifier supplies a purely resistive load from a sinusoidal source. Let $v_L(t)$ be the load voltage and $v_D(t)$ be the diode voltage, measured with reference to the anode. Which of the following statements is always true over one complete cycle?**

Ans
- ✗ 1. The rms value of vD(t) equals the rms value of the source voltage.
- ✗ 2. The average value of vD(t) is zero because the diode conducts for half the cycle.
- ✓ 3. The average values of vL(t) and vD(t) are equal in magnitude and opposite in sign.
- ✗ 4. The average value of vD(t) becomes zero if the diode orientation is reversed.

Q.70 **A 5 kg object experiences a gravitational force of about 49 N on Earth. This implies the value of g used is approximately:**

Ans
- ✗ 1. 9.8 m/s^2
- ✓ 2. 2 m/s^2
- ✗ 3. 19.6 m/s^2
- ✗ 4. 4.9 m/s^2

Q.71 **If the mobility of the holes is reduced to half its original value, keeping other parameters constant, then the conductivity of a p-type semiconductor is _____.**

Ans
- ✗ 1. Reduced to half
- ✗ 2. Tripled
- ✗ 3. Doubled
- ✓ 4. Constant

Q.72 **A logic function is given by F = ABC + DE. You are allowed to use only two input AND gates and NOT gates. How many minimum number of two input AND gates and how many minimum number of NOT gates are required to implement this function?**

Ans
- ✗ 1. 3 AND gates and 3 NOT gates
- ✓ 2. 2 AND gates and 1 NOT gate
- ✗ 3. 4 AND gates and 3 NOT gates
- ✗ 4. 3 AND gates and 2 NOT gates

Q.73 **When several resistors are connected in series, which physical quantity has an identical value across each resistor?**

Ans
- ✗ 1. Current
- ✓ 2. Voltage
- ✗ 3. Resistance
- ✗ 4. Power

Q.74 **If a uniform magnetic field is parallel to the plane of a surface, the magnetic flux through the surface is _____.**

Ans
- ✗ 1. zero
- ✓ 2. maximum
- ✗ 3. infinite
- ✗ 4. half of maximum

Q.75 **The SI unit of specific resistance (resistivity) is _____.**

Ans
- ✓ 1. ohm
- ✗ 2. ohm-metre
- ✗ 3. ohm per metre
- ✗ 4. ohm per square metre

Q.76 If a charge of 2 C placed in an electric field experiences a force of 10 N, what is the magnitude of the electric field at that point?

Ans

✔ 1. $2\ \frac{N}{C}$

✘ 2. $3\ \frac{N}{C}$

✘ 3. $5\ \frac{N}{C}$

✘ 4. $4\ \frac{N}{C}$

Q.77 Which of the following materials acts as a good insulator in electric circuits?

Ans

✔ 1. Iron rod

✘ 2. Mercury

✘ 3. Plastic

✘ 4. Graphite

Q.78 Ohm's law may NOT hold true when ____.

Ans

✔ 1. The temperature of the conductor remains constant

✘ 2. The conductor is metallic

✘ 3. The material obeys linear V–I relation

✘ 4. The temperature of the conductor increases

Q.79 Which device converts mechanical energy into electrical energy through electromagnetic induction?

Ans

✘ 1. Electric generator

✘ 2. Capacitor

✔ 3. Electric motor

✘ 4. Battery

Q.80 In 8051 microcontroller, PSEN is an ____ output signal used as a read strobe for accessing the ____ memory.

Ans

✘ 1. active low, external program

✘ 2. active low, internal ram

✘ 3. active high, internal ram

✔ 4. active high, external program

Q.81 The resistivity of a semiconductor decreases with the increase in temperature because:

Ans

✔ 1. Band gap increases

✘ 2. Lattice vibrations stop

✘ 3. More charge carriers are generated

✘ 4. Electrons lose energy

Q.82 Two conductors of the same material have lengths L and 2L and equal resistance. The ratio of their cross-sectional areas (A_1:A_2) is _____.

Ans

✘ 1. 4:1

✘ 2. 1:4

✘ 3. 2:1

✔ 4. 1:2

Q.83 **Which of the following statements correctly describes weight?**

Ans
- ✔ 1. Weight has no direction
- ✘ 2. Weight only shows how heavy something is
- ✘ 3. Weight has both magnitude and direction
- ✘ 4. Weight is measured in kilograms

Q.84 **Which of the following correctly defines the electric field at a point?**

Ans
- ✘ 1. Energy per unit area
- ✘ 2. Energy available per unit charge
- ✘ 3. Force acting per unit charge
- ✔ 4. Force acting per unit mass

Q.85 **When the two inputs of a 2-input NAND gate are tied together to form a single input A, the resulting circuit behaves as which logic gate?**

Ans
- ✘ 1. XOR gate
- ✔ 2. AND gate
- ✘ 3. OR gate
- ✘ 4. NOT gate (Inverter)

Q.86 **Which of the following quantities remains the same at all locations in the universe?**

Ans
- ✘ 1. Gravitational force
- ✔ 2. Weight
- ✘ 3. Apparent weight
- ✘ 4. Mass

Q.87 **In a parallel connection, if one resistor breaks (open circuit) then ____.**

Ans
- ✘ 1. Other branches keep working
- ✔ 2. The entire circuit stops working
- ✘ 3. Voltage becomes zero
- ✘ 4. Battery gets damaged

Q.88 **Which of the following is a fundamental (base) quantity in the SI system?**

Ans
- ✔ 1. Mass
- ✘ 2. Force
- ✘ 3. Work
- ✘ 4. Pressure

Q.89 **Two resistors 6 Ω and 3 Ω are connected in parallel. The total resistance is:**

Ans
- ✘ 1. 4 Ω
- ✘ 2. 1 Ω
- ✘ 3. 9 Ω
- ✔ 4. 2 Ω

Q.90 **Which symbol is used to represent a resistor in a circuit diagram?**

Ans
- ✘ 1. Arrow mark
- ✘ 2. Two parallel plates
- ✔ 3. Zig-zag line
- ✘ 4. Circle with pointer

Q.91 **The force on a current-carrying conductor in a magnetic field is maximum when ____.**

Ans
- ✔ 1. The current is parallel to the magnetic field
- ✘ 2. The current is opposite to the magnetic field
- ✘ 3. The current is perpendicular to the magnetic field
- ✘ 4. The magnetic field is zero

Q.92 **A circular loop of radius r is placed in a uniform magnetic field $\vec{B}$. If the plane of the loop is perpendicular to the field, the magnetic flux through the loop is _____.**

Ans
- ✘ 1. 2πr2B
- ✘ 2. 2πrB
- ✔ 3. Br
- ✘ 4. πr2B

Q.93 **Two transistor biasing circuits have stability factors $S_1 = 101$ and $S_2 = 15$. Which circuit offers better thermal stability?**

Ans
- ✘ 1. Both have equal stability
- ✔ 2. Circuit 1
- ✘ 3. Circuit 2
- ✘ 4. Cannot be compared

Q.94 **In a PNP transistor, an increase in collector–base reverse bias causes a slight increase in collector current even when the emitter current is held constant. This occurs primarily because:**

Ans
- ✔ 1. The emitter injection efficiency decreases
- ✘ 2. The effective base width decreases with collector–base voltage
- ✘ 3. The collector resistance decreases due to depletion region expansion
- ✘ 4. Hole mobility increases in the collector region

Q.95 **Port 0 of the 8051 microcontroller differs architecturally from the other ports primarily because:**

Ans
- ✘ 1. It cannot function as an output port
- ✘ 2. It is reserved only for memory expansion
- ✘ 3. It is not bit-addressable
- ✔ 4. It does not contain internal pull-up resistors

Q.96 **If the time/div knob of the CRO is on 2 ms/div and the positive half cycle of the periodic triangular signal occupies 2 unit of the X-axis, then the time period of the signal is _____.**

Ans
- ✘ 1. 16 ms
- ✔ 2. 2 ms
- ✘ 3. 8 ms
- ✘ 4. 4 ms

Q.97 **A straight conductor of length 1 m carrying a current of 5 A is placed perpendicular to a magnetic field of 0.2 T. The force acting on the conductor is _____.**

Ans
- ✘ 1. 5.0 N
- ✔ 2. 0.2 N
- ✘ 3. 0.04 N
- ✘ 4. 1.0 N

Q.98 **For a R-L-C series circuit connected to the input signal 4Vp-p,1KHz periodic sinusoidal ac signal and the voltage drop across the resistor R measured with the help of CRO displays a sine wave occupying 2 units total height and volts /div knob at 1V ,then the RMS current for the circuit is approximately _____ if R=10Ω.**

Ans
- ✗ 1. 0.14 A
- ✗ 2. 1.414A
- ✓ 3. 0.71 A
- ✗ 4. 0.071A

Q.99 **If the potential difference across a resistor is doubled while resistance remains constant, the power consumed becomes _____.**

Ans
- ✓ 1. half
- ✗ 2. one-fourth
- ✗ 3. four times
- ✗ 4. double

Q.100 **One coulomb of charge is approximately equal to the charge of _____.**

Ans
- ✗ 1. 6×1018 electrons
- ✗ 2. 6×106 electrons
- ✓ 3. 6×1010 electrons
- ✗ 4. 6×1012 electrons

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