

RRB Technician Grade I Signal 2025

Technician Grade I Signal · CEN 02/2025 · BasicSci · Question Paper Compilation

Kannada

Single Shift (Set) · BasicSci Section · Official Answer Key

About this Compilation

This booklet compiles all **1 shift papers** of the **RRB Technician Grade I Signal 2025** examination (CEN 02/2025) in **Kannada** (**BasicSci** section only), with the correct option marked as per the official answer key.

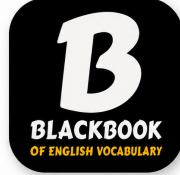
✓ Correct option (highlighted green)

How to use

- Use the **Index** page to jump directly to any set (clickable).
- Questions appear in shift order, numbered 1 onward within each set.
- Diagram and wide-table questions appear at full width at the end of their set.
- The correct answer is highlighted in green with a tick.

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Index — All Sets (click to open)

Set 1

13 Mar 2026

9:00 AM - 10:30 AM

BasicSci

35 Questions • Answer Key

Q1 BasicSci

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

- A. resistance
- B. current ✓
- C. power
- D. voltage

Q2 BasicSci

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

- A. lattice vibrations stop
- B. electrons lose energy
- C. more charge carriers are generated ✓
- D. band gap increases

Q3 BasicSci

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 _____.

- A. doubled
- B. reduced to half ✓
- C. constant
- D. tripled

Q4 BasicSci

One coulomb of charge is approximately equal to the charge of _____.

- A. 6×10^6 electrons
- B. 6×10^{10} electrons
- C. 6×10^{18} electrons ✓
- D. 6×10^{12} electrons

Q5 BasicSci

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?

- A. ಡಯೋಡ್ ಅರ್ಧ ಚಕ್ರದವರೆಗೆ ವಾಹಕವಾಗಿರುವುದರಿಂದ $v_D(t)$ ನ ಸರಾಸರಿ ಮೌಲ್ಯವು ಶೂನ್ಯವಾಗಿರುತ್ತದೆ
- B. ಒಂದು ವೇಳೆ ಡಯೋಡ್ ಓರಿಯಂಟೇಶನ್ ಹಿಮ್ಮುಖವಾಗಿದ್ದರೆ $v_D(t)$ ನ ಸರಾಸರಿ ಮೌಲ್ಯವು ಶೂನ್ಯವಾಗುತ್ತದೆ
- C. $v_D(t)$ ನ rms ಮೌಲ್ಯವು ಮೂಲ ವೋಲ್ಟೇಜ್‌ನ rms ಮೌಲ್ಯಕ್ಕೆ ಸಮನಾಗಿರುತ್ತದೆ
- D. $v_L(t)$ ಮತ್ತು $v_D(t)$ ಗಳ ಸರಾಸರಿ ಮೌಲ್ಯಗಳು ಪರಿಮಾಣದಲ್ಲಿ ಸಮನಾಗಿವೆ ಮತ್ತು ಚಿಹ್ನೆಯಲ್ಲಿ ವಿರುದ್ಧವಾಗಿವೆ ✓

Q6 BasicSci

Which of the following statements correctly describes weight?

- A. weight only shows how heavy something is
- B. weight is measured in kilograms
- C. weight has both magnitude and direction ✓
- D. weight has no direction

Q7 BasicSci

The force on a current-carrying conductor in a magnetic field is maximum when _____.

- A. the magnetic field is zero
- B. the current is parallel to the magnetic field
- C. the current is opposite to the magnetic field
- D. the current is perpendicular to the magnetic field ✓



Q8 BasicSci

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 _____.

A. 1:4

B. 2:1

C. 4:1

D. 1:2

**Q9 BasicSci**

In a parallel connection, if one resistor breaks (open circuit) then _____.

A. the entire circuit stops working

B. other branches keep working



C. battery gets damaged

D. voltage becomes zero

Q10 BasicSci

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 _____.

A. 0.2 n

B. 1.0 n



C. 0.04 n

D. 5.0 n

Q11 BasicSci

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?

A. 2 and ಗೇಟ್‌ಗಳು ಮತ್ತು 1 not ಗೇಟ್

B. 3 and ಗೇಟ್‌ಗಳು ಮತ್ತು 2 not ಗೇಟ್‌ಗಳು

C. 3 and ಗೇಟ್‌ಗಳು ಮತ್ತು 3 not ಗೇಟ್‌ಗಳು

D. 4 and ಗೇಟ್‌ಗಳು ಮತ್ತು 3 not ಗೇಟ್‌ಗಳು

**Q12 BasicSci**

Two resistors $6\ \Omega$ and $3\ \Omega$ are connected in parallel. The total resistance is:

A. $4\ \omega$ B. $2\ \omega$ C. $9\ \omega$ D. $1\ \omega$ **Q13 BasicSci**

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

A. ohm per metre

B. ohm

C. ohm-metre



D. ohm per square metre

Q14 BasicSci

Which of the following is a fundamental (base) quantity in the SI system?

A. mass



B. work

C. pressure

D. force

Q15 BasicSci

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

A. circuit 2



B. both have equal stability

C. cannot be compared

D. circuit 1

Q16 BasicSci

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

A. maximum

B. half of maximum

C. infinite

D. zero



Q17 BasicSci

Which of the following quantities remains the same at all locations in the universe?

- A. weight
- B. apparent weight
- C. gravitational force
- D. mass

**Q18 BasicSci**

For a R-L-C series circuit connected to the input signal $4V_p$ -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 $R=10\Omega$.

- A. 1.414a
- B. 0.14 a
- C. 0.71 a
- D. 0.071a

**Q19 BasicSci**

Which symbol is used to represent a resistor in a circuit diagram?

- A. arrow mark
- B. zig-zag line
- C. circle with pointer
- D. two parallel plates

**Q20 BasicSci**

Magnetic flux depends on :

- A. only angle
- B. only area
- C. area, magnitude of b and its orientation
- D. only magnetic field

**Q21 BasicSci**

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

- A. 2 m/s^2
- B. 9.8 m/s^2
- C. 19.6 m/s^2
- D. 4.9 m/s^2

**Q22 BasicSci**

Which of the following correctly defines the electric field at a point?

- A. energy per unit area
- B. energy available per unit charge
- C. force acting per unit charge
- D. force acting per unit mass

**Q23 BasicSci**

Ohm's law may NOT hold true when ____.

- A. the conductor is metallic
- B. the temperature of the conductor remains constant
- C. the material obeys linear v-i relation
- D. the temperature of the conductor increases

**Q24 BasicSci**

Port 0 of the 8051 microcontroller differs architecturally from the other ports primarily because:

- A. ಇದು ಬಿಟ್-ಅಡ್ರೆಸ್‌ಬಲ್ ಅಲ್ಲ
- B. ಇದು ಆಂತರಿಕ ಪುಲ್-ಅಪ್ ರೆಸಿಸ್ಟರ್‌ಗಳನ್ನು ಹೊಂದಿರುವುದಿಲ್ಲ
- C. ಇದು ಮೆಮೊರಿ ವಿಸ್ತರಣೆಗೆ ಮಾತ್ರ ಮೀಸಲಾಗಿದೆ
- D. ಇದು ಔಟ್‌ಪುಟ್ ಪೋರ್ಟ್ ಆಗಿ ಕಾರ್ಯನಿರ್ವಹಿಸಲು ಸಾಧ್ಯವಿಲ್ಲ



Q25 BasicSci

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

- A. half
- B. four times
- C. double
- D. one-fourth

Q26 BasicSci

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?

- A. 10 w
- B. 5 w
- C. 15 w
- D. 30 w

Q27 BasicSci

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?

- A. not ಗೇಟ್ (ಇನ್ವರ್ಟರ್)
- B. and ಗೇಟ್
- C. or ಗೇಟ್
- D. xor ಗೇಟ್

Q28 BasicSci

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:

- A. ಪರಿಣಾಮಾತ್ಮಕ ಬೇಸ್ ಅಗಲವು ಕಲೆಕ್ಟರ್ - ಬೇಸ್ ವೋಲ್ಟೇಜ್‌ನೊಂದಿಗೆ ಕಡಿಮೆಯಾಗುತ್ತದೆ
- B. ಸಂಗ್ರಾಹಕ ಪ್ರದೇಶದಲ್ಲಿ ಹೋಲ್ ಗತಿಶೀಲತೆ ಹೆಚ್ಚಾಗುತ್ತದೆ
- C. ಡಿಪ್ಲಿಷನ್ ಪ್ರದೇಶದ ವಿಸ್ತರಣೆಯಿಂದಾಗಿ ಸಂಗ್ರಾಹಕ ರೋಧವು ಕಡಿಮೆಯಾಗುತ್ತದೆ
- D. ಎಮಿಟ್ಟರ್ ಇಂಜಕ್ಷನ್ ದಕ್ಷತೆಯು ಕಡಿಮೆಯಾಗುತ್ತದೆ

Q29 BasicSci

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 _____.

- A. 8 ms
- B. 4 ms
- C. 16 ms
- D. 2 ms

Q30 BasicSci

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

- A. ಇಂಟರ್‌ನಲ್ ರಾಮ್, ಆಕ್ಷಿವ್ ಹೈ
- B. ಎಕ್ಸ್‌ಟರ್ನಲ್ ಪ್ರೋಗ್ರಾಂ, ಆಕ್ಷಿವ್ ಹೈ
- C. ಎಕ್ಸ್‌ಟರ್ನಲ್ ಪ್ರೋಗ್ರಾಂ, ಆಕ್ಷಿವ್ ಲೋ
- D. ಇಂಟರ್‌ನಲ್ ರಾಮ್, ಆಕ್ಷಿವ್ ಲೋ

Q31 BasicSci

Which device converts mechanical energy into electrical energy through electromagnetic induction?

- A. battery
- B. electric motor
- C. electric generator
- D. capacitor

Q32 BasicSci

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 _____.

- A. 20 ω
- B. 5 ω
- C. 15 ω
- D. 10 ω



Q33 BasicSci

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

- A. mercury
- B. graphite
- C. iron rod
- D. plastic

**Q34 BasicSci**

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 _____.

- A. $2\pi r b$
- B. $2\pi r^2 b$
- C. $\pi r^2 b$
- D. br

**Q35 BasicSci**

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?

- A.
- B.
- C.
- D.

