

# Indian Statistical Institute

Recruitment for the post of Engineer (Electrical) 'A' against  
Advertisement No. REC-10/2023-7, KOL dated 28.10.2023

**Please go through the following before appearing for the Written Test.**

- Duration of the Written Test (MCQ) is **two hours** for the candidates belonging to all the categories, except for PwBD candidates who applied against the posts reserved for PwBD.
  - PwBD candidates will be allowed forty (40) minutes of compensatory time for the Written Test, on production of a valid certificate from the Chief Medical Officer/ Civil Surgeon/ Medical Superintendent of a Government Health Care Institution as per the prescribed Proforma to the effect that the candidate has physical limitations to write.
  - There are two sections (Section A and Section B) in this Written Test. Section A comprises 15 questions, while there are 35 questions in Section B.
  - For each question (either in Section A or B), there are 4 suggested answers ('(a)', '(b)', '(c)' and '(d)'), of which only one is correct. A candidate needs to put one of these four options in the column with the heading "Answer", corresponding to a question. S/he will score four (4) marks for each correctly answered question, zero (0) mark for each incorrectly answered question, and one (1) mark for each unattempted question. Note that the maximum marks that a candidate can score are 60 in Section A and 140 in Section B.
  - If a candidate writes two or more options as answer to a question, it will be treated as a wrong answer and zero (0) mark will be awarded for this question.
-

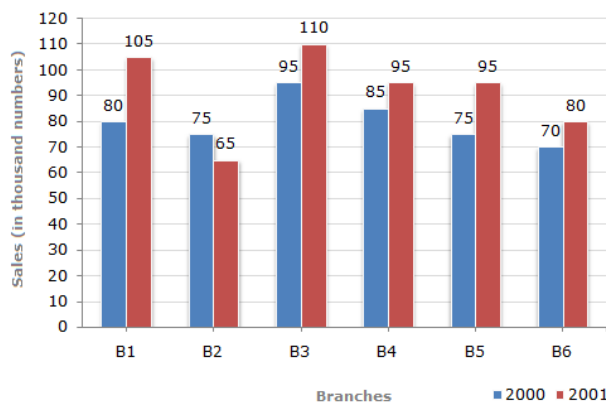
## Syllabus for Section A

Basic English Language, Arithmetic Aptitude, Analytical Reasoning

### Sample Questions for Section A

1. Which part of the sentence has errors in it?
  - (a) If one
  - (b) has to live in a society
  - (c) he must conform to its rules
  - (d) No error
  
2. The lecture was boring, everyone was busy on their phone \_\_\_\_\_ the session.
  - (a) in
  - (b) at
  - (c) after
  - (d) during
  
3. Arrange the words below to make a meaningful sentence
  1. him
  2. the
  3. to
  4. charge
  5. handover
  - (a) 42531
  - (b) 41352
  - (c) 45231
  - (d) 52431
  
4. The first and the last parts of the sentence are numbered 1 and 6. The rest of the sentence is split into four Parts named P, Q, R and S. These four parts are not given in proper order. Read the parts and find out which of the four combinations is correct.
  1. The symptoms of
    - P. and certain other changes
    - Q. what is popularly called
    - R. serious forgetfulness, confusion
    - S “serility” include
  6. in personality behaviour.
  - (a) QSRP
  - (b) PQRS
  - (c) SRQP
  - (d) QPSR

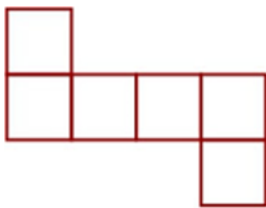
5. It \_\_\_\_\_ raining continuously since yesterday.
- has been
  - had been
  - would have been
  - is
6. The sum of three numbers is 98. If the ratio of the first to second is 2:3 and that of the second to the third is 5:8, then the second number is:
- 30
  - 20
  - 48
  - 5
7. The bar graph given below shows the sales of books (in thousand number) from six branches of a publishing company during two consecutive years 2000 and 2001. Sales of Books (in thousand numbers) from Six Branches - B1, B2, B3, B4, B5 and B6 of a publishing Company in 2000 and 2001.



- What percent of the average sales of branches B1, B2 and B3 in 2001 is the average sales of branches B1, B3 and B6 in 2000?
- 75%
  - 77.5%
  - 82.5%
  - 87.5%
8. A rectangular piece of paper  $11\text{ cm} \times 4\text{ cm}$  is folded without overlapping to make a cylinder of height 4 cm. Find the volume of the cylinder.
- $27\text{ cm}^3$
  - $38.5\text{ cm}^3$
  - $45.75\text{ cm}^3$
  - $30\text{ cm}^3$

9. In a library, 20% books are Italian, 50% of the remaining are in English and the remaining 9000 are in various other languages. What is the total number of books in English?
- (a) 2250
  - (b) 9000
  - (c) 20700
  - (d) 22500

10. The shape below is made up of identical small squares. If the area of the whole shape is 24 cm<sup>2</sup>, what is its perimeter?



- (a) 24 cm
  - (b) 28 cm
  - (c) 48 cm
  - (d) 6 cm
11. If in a certain code, “NATURE” is coded as “MASUQE” then how will “FAMINE” be coded in that code?
- (a) EALIME
  - (b) EBMJND
  - (c) EZNJME
  - (d) EZMHND
12. Find the analogy

Greed : Corruption

- (a) Knowledge : Book
- (b) Sleep : Dream
- (c) Insult : Friendship
- (d) Goodwill : Friendship

13. Four people P, Q, R and S have to sit on the four linearly arranged stools marked 1, 2, 3 and 4. P sits down on stool 4. Q does not want to sit on a stool that is immediately next to P's. Keeping this in mind, in how many different ways could Q, R and S arrange themselves on the remaining stools?

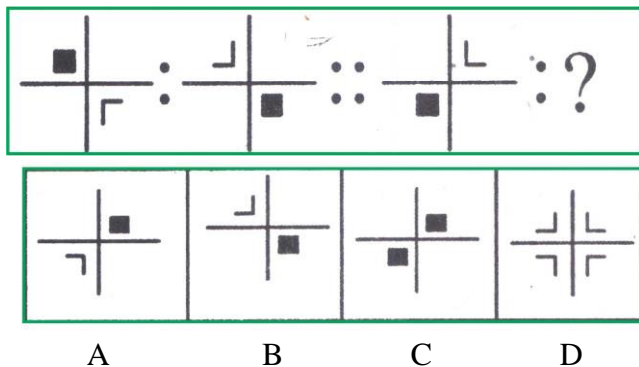
- (a) 6
- (b) 4
- (c) 3
- (d) 2

14. Select the option that is related to the fifth number in the same way as the second number is related to the first number and fourth number to the third number:

139:228 :: 122:211 :: 2:?

- (a) 91
- (b) 198
- (c) 89
- (d) 189

15. Select the correct option.



- (a) A
- (b) B
- (c) C
- (d) D

### Syllabus for Section B

- Electrical Engineering materials, estimation and costing
- Fundamentals of Electrical Engineering
- Electrical Circuits
- Fundamentals of Power Electronics
- Power Supply Systems, conductors and electrical wiring, cables for low voltage applications and their laying

- Distribution transformers and substations, busbar arrangements, distribution system for residential and institutional buildings
- Protective devices for distribution systems
- Protection and safety issues of sensitive laboratory equipments
- Earthing and electrical safety issues
- Motors and pumps for residential applications and their maintenance
- Measurement of electrical quantities, voltage regulation, power factor correction
- Operation, control and protection for elevators
- Basics of air conditioning systems, their operation and maintenance
- Electricity rules and acts
- Electricity tariffs, load distribution, load balancing and energy efficiency
- Solar Photovoltaic systems
- Batteries for PV and other low voltage applications

### **Sample Questions for Section B**

1. According to IS Specification, IS: 4648-1968, the maximum load in a lighting sub-circuit is restricted to
  - (a) 500W
  - (b) 1000W
  - (c) 800W
  - (d) 2000 W
  
2. Which one of the following properties of the insulating material is not acceptable?
  - (a) High insulation resistance
  - (b) Low dielectric strength
  - (c) Free from porosity
  - (d) Non-hygroscopic
  
3. For the same power transmission, the same power loss, the same power factor and the same maximum voltage between conductor and earth, the ratio of copper requirement for AC 3- $\phi$ , 4-wire system to AC 1- $\phi$ , 2-wire system is
  - (a)  $\frac{1}{2}$
  - (b) 1
  - (c)  $\frac{5}{4}$
  - (d)  $\frac{1}{3}$

4. RCCB operates when there is
  - (a) Short circuit
  - (b) Over-current
  - (c) Both short circuit and over-current
  - (d) Earth leakage.
  
5. Digit display of  $4^{1/2}$  in digital multimeter means the display range is
  - (a) 00000 to 19999
  - (b) 0000.5 to 4444.5
  - (c) 00000 to 99999
  - (d) 0000.5 to 9999.5
  
6. In 3 phase 11kV supply, the
  - (a) Peak value of voltage between phase and neutral is 11kV.
  - (b) RMS value of voltage between phase and neutral is 11kV.
  - (c) RMS value of voltage between two phases is 11kV.
  - (d) Peak value of voltage between two phases is 11 kV.
  
7. Load factor of which type of the following loads is expected to be the best?
  - (a) Street lighting
  - (b) Residential
  - (c) Shopping mall
  - (d) Academic Institutions
  
8. Two lamps rated 100W, 220V and 100W, 110V are connected in series across a 220V supply. Then
  - (a) The 100W, 110V lamp will glow more brightly.
  - (b) The 100W, 220V lamp will glow more brightly.
  - (c) Both the lamps will glow with equal brightness.
  - (d) Lamps will not glow.
  
9. In split AC (Air Conditioner),
  - (a) Outdoor unit contains compressor and condenser, and indoor unit contains distributor and filter components.
  - (b) Outdoor unit contains compressor and filter components, and indoor unit contains condenser and distributor.
  - (c) Outdoor unit contains compressor, and indoor unit contains condenser, filter and distributor.
  - (d) Outdoor unit contains compressor, condenser and filter, and indoor unit contains distributor.

10. MCB works using

- (a) Magnetic effect of current
- (b) Heating effect of current
- (c) Magnetic and heating effect of current
- (d) Electrostatic effect