

Indian Statistical Institute

Recruitment for the post of Engineering Assistant (Civil) '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.
 - A candidate, applied for the posts reserved for PwBD, will be allowed forty (40) minutes of compensatory time for the Written Test, on production of a valid certificate, to the effect that the candidate has physical limitations to write, from the Chief Medical Officer/Civil Surgeon/Medical Superintendent of a Government Health Care Institution as per the prescribed Proforma.
 - 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.
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Syllabus for Section A

Basic English Language, Arithmetic Aptitude, Analytical Reasoning

Sample Questions for Section A

1. Arrange P, Q, R and S to make a meaningful sentence:

P: showed that 65% of days in December had recorded

Q: “severe” or “hazardous” level of pollution

R: data by the Centre for Science and Environment

S: an analysis of Delhi’s real-time air quality

- (a) PQRS
- (b) SRPQ
- (c) SQPR
- (d) RSQP

2. Choose the correct preposition:

All the office staff sympathised him in his grief.

- (a) with
- (b) for
- (c) to
- (d) at
- (e) None of these

3. Which part of the sentence has errors in it? Choose D if you think that the sentence has no error.

The train had left (A) / when he had reached (B) / the station (C) / No error (D)

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

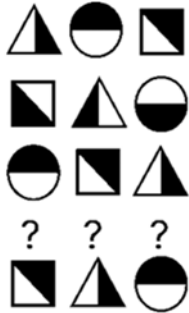
4. Choose the correct option: Stop so many mistakes.

- (a) to make
- (b) make
- (c) making
- (d) makes

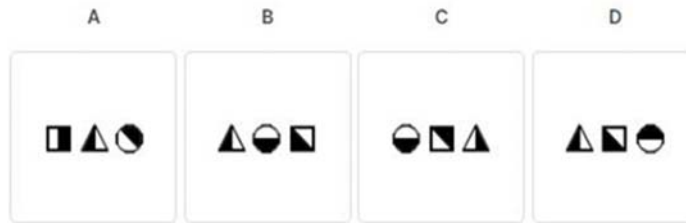
5. Correct the underlined portion of the sentence:
We don't know how did the thief made an escape.
- (a) how the thief does make
 - (b) how was the thief made
 - (c) how the thief made
 - (d) No correction required
6. Look at the number series: 2, 1, $\frac{1}{2}$, $\frac{1}{4}$, Which number should come next?
- (a) $\frac{1}{3}$
 - (b) $\frac{1}{8}$
 - (c) $\frac{2}{8}$
 - (d) $\frac{1}{16}$
7. What is the value of t in the equation: $3t - 11 = (-5)(t - 2)$
- (a) $\frac{1}{8}$
 - (b) $\frac{1}{2}$
 - (c) $2\frac{1}{8}$
 - (d) $13\frac{1}{2}$
8. A tank contains 30 litres more water when it is 50% full than when it is 40% full. What is the capacity of the tank?
- (a) 60 litres
 - (b) 75 litres
 - (c) 300 litres
 - (d) 400 litres
9. If 40% of a number is equal to two-third of another number, what is the ratio of the first number to the second number?
- (a) 3 : 7
 - (b) 2 : 5
 - (c) 7 : 3
 - (d) 5 : 3
10. Ravi and Raju are jogging along the boundary of a square lawn ABCD, with side 10 m. They both start at point A and run clockwise. Ravi runs at 5 m/s and Raju runs at 3 m/s. What will be the distance between them after 20 seconds?
- (a) 0 m
 - (b) 2 m
 - (c) 20 m
 - (d) 40 m

11. If NOIDA is written as OPJEB, then what will be the code for DELHI?
- (a) EFMAK
 - (b) EFAMK
 - (c) EFMIJ
 - (d) EFMIK
12. Paisa : Rupee :: ? : Kilometre
- (a) Metre
 - (b) Hectometre
 - (c) Quintal
 - (d) Decametre
13. Point A is 15 m towards the south of point B. Point C is 8 m towards the east of point B. Point D is 15 m towards the south of point C. Point E is 3 m towards the west of point D. Point F is 6 m towards the south of point E. Point G is 2 m towards the east of point F. what is the shortest distance between A and D?
- (a) 8 m
 - (b) 5 m
 - (c) 6 m
 - (d) 9 m
14. Find the odd one out:
- (a) index
 - (b) glossary
 - (c) book
 - (d) chapter

15.



Choose the correct option to complete the sequence



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

Syllabus for Section B

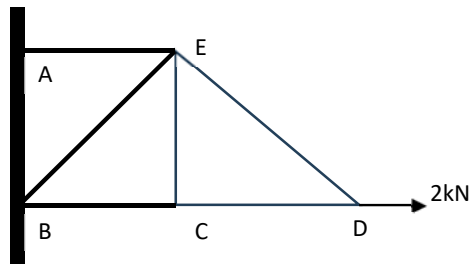
- Components of a residential building and their functions, Introduction to Industrial buildings and types. Building Planning – Basic requirements, elements, introduction to various building area terms, computation of plinth area, carpet area
- Building materials – Bricks, properties and specifications, Cement – Types, properties, grades, other types of cement and uses, Cement mortar – Constituents, Preparation, Concrete – PCC and RCC, Grades, Steel – Use of steel in buildings, Types, Modern construction material
- Surveying – principle and objectives, Instruments used, Horizontal measurements, Ranging (direct ranging only), Instruments used for ranging, Leveling – principles, Instruments, Preparation of level book, Modern surveying instruments – EDM, Total Station, GPS
- Building Construction – Foundations, Classification, Bearing capacity of soil and related terms (definition only), Masonry works – classifications, definition of different technical terms, Brick masonry – types, bonds, general principle, Roofs – functional requirements, basic technical terms, roof covering material, Floors – function, types, flooring materials (brief discussion), Plastering and painting – objectives, types, preparation and procedure of application

- Basic Infrastructure services – air conditioning & purpose, fire protection & materials, Ventilation, necessity & functional requirements, Lifts, Escalators
- Concrete Technology-Ingredients of Concrete, water-cement ratio, properties of fresh and hardened concrete, concrete mix design
- Need of Measurement in engineering and science, unit of a physical quantities - fundamental and derived units, systems of units (FPS, CGS and SI units)
- Engineering Drawing - Dimensioning Technique, Scales, Drawing of full section, half section, partial or broken out sections, General arrangement Drawing (Plan, Elevation, Section etc.), Reinforcement detail drawing
- Structural Mechanics - Properties of materials, Simple stresses and strains, Shear force and bending moment, Moment of inertia, Bending stresses in beams, Shear stresses in beams, Slope and deflection, Analysis of trusses, beams, slabs, columns and foundations
- Basic Reinforced Concrete design of structural elements using Limit State Method, Basic Steel design
- Repair and Maintenance of Buildings, Crack control, Plumbing services, Corrosion and its control
- Building Water Supply, Basics of waste water engineering, Sewerage system, Building Drainage
- Basic Soil Mechanics – Physical and index properties, Relationships, Gradation of soil, Permeability, Seepage, Compaction, Consolidation

Sample Questions for Section B

1. The ratio of strengths, in bending, of solid shaft to hollow shaft, both having outside diameter D and hollow shaft having inside diameter $D/2$, is
 - (a) $1/4$
 - (b) $1/2$
 - (c) $1/16$
 - (d) $15/16$

2. In the following structure, zero force member is



- (a) AE.
 - (b) BC.
 - (c) EC.
 - (d) ED.
3. The approximate strength of concrete at 28 days as percentage of strength at one year is
- (a) 98.
 - (b) 90.
 - (c) 80.
 - (d) 75.
4. Lower water-cement ratio in concrete
- (a) Increases the compressive strength.
 - (b) Increases permeability of concrete.
 - (c) Increases shrinkage and creep.
 - (d) Reduces frost-resistance of concrete.
5. The standard size of a concrete cube for compressive strength test is
- (a) 50mm.
 - (b) 100mm.
 - (c) 150mm.
 - (d) 200mm.
6. The item of work NOT included in the plinth area estimate is
- (a) Wall thickness
 - (b) Room area
 - (c) Verandah area
 - (d) Courtyard area
7. The main reinforcement in cantilever verandah should be
- (a) At the top of slab.
 - (b) At the bottom of slab.
 - (c) Both at top and bottom of the slab.
 - (d) Only at the corner of the slab.

8. The quantity of seepage of water through soil is proportional to
- (a) Coefficient of permeability of soil.
 - (b) Total head loss through the soil.
 - (c) Neither (a) nor (b).
 - (d) Both (a) and (b).
9. For completion of a project, the critical path of the network represents
- (a) Minimum time.
 - (b) Maximum time.
 - (c) Maximum cost.
 - (d) Minimum cost.
10. B.O.D. of treated water should be
- (a) 10 ppm.
 - (b) 20 ppm.
 - (c) 5 ppm.
 - (d) Nil.