

ESE 2019
Prelims Paper-I



GENERAL STUDIES & ENGINEERING APTITUDE

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GENERAL STUDIES & ENGINEERING APTITUDE

PRACTICE QUESTION BOOK

*UPSC Engineering Services
Preliminary Examinations Paper-I*



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Preface

Engineering Services Exam (ESE) is one of most coveted exams written by engineering students aspiring for reputed posts in the country. As all the senior engineering posts come under the Government of India, ESE is conducted by the Union Public Services Commission (UPSC), and therefore the standards to clear this exam too are very high. To clear the ESE, a candidate needs to clear three stages – ESE Prelims, ESE Mains and Personality Test.

This practice question book is an endeavour by IES Master to help ESE aspirants clear the Paper-1 i.e. General Studies & Engineering Aptitude of the very first stage i.e. ESE Prelims. The Paper-1 carries 200 marks, and should not be taken lightly. With more than 3,000 practice questions sorted topic-wise, students will get a chance to quickly brush through all the topics in a short span. Practising as many questions possible will help candidates in going through whatever they have learned so far, and will count as a round of revision. The detailed solution for each question will help them identify their strengths and weaknesses, and build confidence before taking the real ESE Prelims. The detailed solutions will also help candidates in understanding the appropriate methods in answering a question and improve their speed and accuracy.

IES Master feels immense pride in bringing out this book as every care has been taken to build upon the exam preparedness of a student right up to UPSC standards. The credit for flawless preparing of this Practice question book for ESE aspirants goes to the entire team of IES Master Publications. Teachers, students, and professional engineers are welcome to share their suggestions to make this book more valuable.

Mr. Kanchan Kumar Thakur
Director–IES Master



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General Studies and Engineering Aptitude Prelims Paper-I (ESE-2018)

GENERAL PRINCIPLES OF DESIGN, DRAWING AND SAFETY

1. **Statement (I)** : Lifts and external staircases are provided with access from the lobby area of each floor in multistorey blocks. The external staircase must be accessible through self-closing, 180°-swing unlocked doors (with provision for locking at appropriate conditions).
- Statement (II)** : Such staircases should not be inadvertently subjected to spreading of smoke, but must yet provide unhindered exit from the lobby of each floor.
2. Consider the following provisions regarding safety on highways, where major improvement works may also be in progress :
1. Highly visible barricades to avoid falling of vehicles in deep interspaces ahead (including drainages)
 2. Wire-net provisions to ward off road slippages
 3. Signages for wild-animals crossing (like deer, elephant etc.)
 4. Signages on minor gradients
- Which of the above are relevant ?
- (a) 1, 2, 3 and 4 (b) 1, 2 and 4 only
(c) 1, 3 and 4 only (d) 1, 2 and 3 only
3. Consider the following statements regarding Ergonomic Design :
1. Reducing the stress on the spinal cord and providing for lesser fatigue-causing sitting arrangements.
 2. Arrangements of keys on the computer keyboard towards optimizing finger stress level.
 3. Catering to increasing demand to produce more pleasing objects.
- Which of the above statements are correct?
- (a) 1 and 2 only (b) 2 and 3 only
(c) 1 and 3 only (d) 1, 2 and 3
4. Consider the following statements regarding a Grillage Foundation :
1. It is provided for heavily loaded isolated columns.
 2. It is treated as a spread foundation.
 3. It consists of two sets of perpendicular placed steel columns.
- Which of the above statements are correct?
- (a) 1 and 2 only (b) 1 and 3 only
(c) 2 and 3 only (d) 1, 2 and 3

ANSWERS

General Principles of Design, Drawing and Safety

1. (b)
2. (d)

3. (a)

4. (a)

SOLUTIONS

GENERAL PRINCIPLES OF DESIGN, DRAWING AND SAFETY

1. (b)

The external staircase provided in a multistory building is generally used for fire escape, hence it should be assessable through self closing, 180 degree swing unlock doors. Also, it should not be subjected to spreading of smoke.

2. (d)

For highway safety minor gradient throughout the project is required to improve the drainage system. But signage on minor gradient is not required. Hence, option d is correct

3. (a)

Ergonomics is the process of designing or arranging workplace, products and systems so they fit the people who use them.

In another word it is the applied science of equipment design, as for the workplace, intended to maximize productivity by reducing operator fatigue and discomfort.

So, option (a) & (b) are correct. Option (c) is related to asthetic design.

4. (a)

- Grillage foundation is special type of isolated footing (spread foundation) generally provided for heavily loaded steel stanchions and used in location of poor bearing capacity.
- The load of the column is distributed or spread to a very large area by means of two or more rolled steel sections (generally I section), each layer laid at right angle to each other. Both the layers of the joists (not column) are then embedded in cement concrete.

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