

FAQs

1. What do you mean by concrete?

Concrete is the proper mix proportion of cement, fine aggregate and coarse aggregate with the designed water-cement ratio.

2. What are the reasons for using steel as an only material in RCC structures?

- a. Steel has more tensile strength than that of other materials
- b. Coefficient of thermal expansion of steel is almost same as that of concrete
- c. There is perfect bond between them.

3. Explain the term: characteristic strength of materials?

In the case of strength the characteristic value is determined from test results using statistical principles, and is normally defined as the value below which not more than 5% of the test results fall.

4. What do you mean by factor of safety?

The ratio between ultimate stress and working stress is factor of safety

5. Write the factor of safety for concrete and steel used in working stress method?

- a. For concrete: 3.0
- b. For steel: 1.8

6. Explain the concept behind the working stress method of design.

In working stress design, sometimes referred to as modular ratio or elastic design, the stresses in the structure at working loads are not allowed to exceed a certain proportion of the yield stress of the construction material, i.e. the stress levels are limited to the elastic range. By assuming that the stress– strain relationship over this range is linear, it is possible to calculate the actual stresses in the material concerned. However, although it modelled real building performance under actual conditions, this philosophy had two major drawbacks. Firstly, working stress design methods sometimes tended to overcomplicate the design process and also led to conservative solutions. Secondly, as the quality of materials increased and the safety margins decreased, the assumption that stress and strain are directly proportional became unjustifiable for materials such as concrete, making it impossible to estimate the true factors of safety.

7. Explain the concept behind the ultimate load design method.

Load factor or plastic design was developed to take account of the behaviour of the structure once the yield point of the construction material had been reached. This approach involved calculating the collapse load of the structure. The working load was derived by dividing the collapse load by a load factor. This approach simplified methods of analysis and allowed actual factors of safety to be calculated.