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[Civil Engineering Interview Questions](#)

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Q1. [What is OSHA?](#)

OSHA aka “Occupational Safety and Health Administration” is a US-based agency of labour that originally has the power to examine the workplaces. The main aim of the OSHA is to ensure the safety of working men and women by checking the condition of workplaces. OSHA also provides training, education and assistance to the people. OSHA’s safety laws and regulation results in reducing the injury rates and injury cost. A main advantage of OSHA is that it does not have any bad effect on the employment, sales, firm survival and credit rating.

Q2. [What is a projection line?](#)

Projection lines are the lines that help in 2D drawing. It is used to create new geometry and the constraints will remain active if the projection lines are off.

Q3. [What are various steps involved in the concreting process?](#)

The various steps are:

- **Batching:** Batching is the measurement of the different material that is needed to make the concrete. Batching can be done with two methods, the first is Volume batching and the other is Weight batching. In Volume batching, the measurement is taken in the form of volume, and in weight batching, the measurement is taken in the form of weight.
- **Mixing:** To get good concrete, mixing of the materials is done. It is done in dry condition and then in wet condition. There are two ways of mixing, one is Hand mixing and the other is Machine mixing.
- **Transportation and placing of concrete:** After the concrete is prepared, it should be transported to a place where it has to be used. Concrete should be dropped on its ultimate destination as much as possible.
- **Compaction of concrete:** After the concrete is placed, it may have an air bubble in it. These air bubbles

may reduce the strength by 30%. Here, the process of compaction is utilized which reduces the air bubble. Compaction can be done by two methods: - By vibrators and by hand

- **Curing:** To complete the hydration process, curing is performed. Curing is the process that allows the concrete to keep the moisture for a while.

Q4. List out the reinforcements that are used in the process of prestressing.

The below reinforcement are used:

1. **Spalling reinforcements:** Spalling stress is the stress which is established behind the loaded area of anchor blocks. As a result, surface concrete breaks apart. Poisson's effects strain interoperability or the stress trajectory shapes are the main reason for this type of stress.
2. **Equilibrium reinforcement:** When prestressing loads are applied on many anchorages consecutively, equilibrium reinforcement is used.
3. **Busting reinforcement:** Busting reinforcement is required to reduce the stress in such a case where the stress trajectories are concave toward the line of action of load.

Q5. List some critical elements for a landfill?

The critical elements for a landfill to keep it secure and to minimize the possibility of wastes escaping to groundwater beneath a landfill are:

- A bottom liner
- A leachate collection system
- A cover
- The natural hydrogeologic setting.

Q6. What is segregation?

Segregation is defined as the particles are segregated in concrete based on size, shape, density, and other properties. There are internal as well as external reasons for the segregation in concrete. The Internal reason is when concrete is not proportioned properly. Some of the external reasons are Vibration, Improper transportation, Adverse weather condition and Placement.

Q7. What is RERA?

Real Estate Act was implemented in 2016 by the parliament of India under which the safety of home-buyer is ensured. It also helps in improving the investment in the real estate industry. Under this act, authorities are established under the name of Real Estate Regulatory Authority (RERA) in every state for regulation of the real

estate sector. This authority also acts as an adjudicating body for disputes.

Q8. How soundness of cement is described?

Soundness is defined as the ability of the cement to maintain its volume. Volume change can cause the expansion in the structure and as a result, minor cracks in the structure occur. The reason for the volume change is the presence of the excess lime or unburnt lime while the cement is manufactured. As a result, oxidation of lime occurs and it converts to calcium carbonate. The volume of calcium carbonate is greater than and therefore it leads to crack.

Q9. Describe what is fatigue?

Fatigue or material fatigue is a phenomenon where a structure is failed due to cyclic load. It can even occur when a good stress range is far below the static material strength. Fatigue is the main reason for the failure of a mechanical structure.

Q10. List some of the common types of roof?

Some of the common types of roof are:

1. Gable
2. Hip
3. Mansard
4. Gambrel
5. Flat
6. Skillion
7. Jerkinhead
8. Butterfly
9. Bonnet
10. Saltbox
11. Sawtooth
12. Curved
13. Pyramid
14. Dome
15. Combination

Q11. What is the nominal mix of M20?

To produce good quality concrete, it is very important to have a basic knowledge of the relative proportion of the material used to make this. As per the codebook, the prescribe concrete mix ratio of M20 is 1:1.5:3

1. Cement = 1 Part
2. Sand = 1.5 Part
3. Aggregate = 3 Part
4. Dry material Required = 1.57 cu.m

Q12. What happens when sugar is added to concrete?

The principle that works here is the glucose catalytic principle. As the sugar has a polyhydroxy group and its surface has a strong polarity, it is good in the absorption of the solid-liquid component.

Functions of Sugar in Concrete:

- Sugar helps in retarding action on Concrete.
- Sugar boosts the Flowability and Compactness.
- Sugar reduces the Hydration Heat and Temperature Cracks.
- It boosts the Later Strength of Concrete.

Q13. What is chuting of concrete?

Chute is used to transport the concrete from where the mixing is done. Usually, it transports the concrete from the ground where the mixer machine is installed to a lower lever-like foundation. But sometimes, instead of being a part of a mixer machine, it can become a part of the transporting process like truck-mixed concrete or discharging plant mixed. And then with the help of a pump or any other lifting method, it is used to transport concrete to a greater height.

The chute is made of metal with a uniform slope. The slope should be flatter so that concrete does not segregate or separate during sliding. Chute slope can be adjusted for concrete mix. Sometimes the chute has a fixed shape. In that case, the mix must be adjusted so that it can slide without segregation.

Q14. What is the green building?

Green building or green construction or sustainable building refers to the method of constructing a higher building which is eco-friendly and costs less to maintain. There are many processes to construct a green building like planning, design, construction, operation, maintenance, renovation and demolition. The green building complements the classical building for durability, economy, utility, comfort.

Q15. What is a lintel?

A lintel is a type of beam used to support the wall. It takes the load from the high wall and transfers it to the masonry walls. Lintel's width is always the same as wall width. It can be used as an enlivening compositional component.

Q16. What is difference between one way and two way slab?

In reinforced concrete construction, the slab is widely used in forming floors and roofs. A slab has a smaller depth in comparison to its span and width. A slab is supported by a masonry wall, column, or beam. The differences between one way and two-way slab are:

One-way slab

In a one-way slab, support is given by a beam on two opposite sides of the slab.

For one-way slabs, the main reinforcement is provided along one direction only

The ratio of longer span to smaller span is greater than or equal to 2.

In this, a slab can bend only in one direction i.e. along in a shorter span.

Loads can be carried along one direction only.

Chajjas and verandahs are an example of One-way slabs.

Two-way slab

In this, support is given by beam to all the four sides of the slab.

For one-way slabs, the main reinforcement is provided along both directions.

The ratio of longer span to smaller span is less than 2.

In this, a slab can bend only in both directions.

Loads can be carried along with both the directions.

It can be seen in big companies where it is used to construct floors.

Q17. What is singly and Doubly Reinforced beam?

A Singly reinforced beam as the name suggests is a beam that can reinforce longitudinally only in the stress zone. Reinforcement carries the bending moment and the stress caused due to bending moment whereas concrete carries the compression. It is necessary to link the stirrups and because of this, it is not possible to provide the reinforcement only in the tension zone. Therefore, two rebars are being used to tie the stirrups in a compression zone

In addition to the tension reinforcement, the doubly reinforced beam also possesses compression reinforcement (on both sides of the beam). So, a beam is considered a doubly reinforced beam if it has both tension in the steel and the compression zone. The doubly reinforced beam is given when the depth/dimensions are limited as reinforcement only on the tension side is not able to endure the bending moment. Thus, a doubly reinforced beam is used in these situations to increase the strength of a beam.

Q18. What is workability of concrete?

The workability of concrete defines the properties of a fresh concrete mixture. It defines how a new fresh concrete can be mixed, placed, consolidated, and finished without segregation. It is a very important property of

concrete as it tells about the strength. It also affects the quality, appearance, finishing operation, and also the cost of labor.

Heavily reinforced section and thin inaccessible section demands more workability rather than a mass concrete body. It determines the work needed to get a freshly mixed concrete without disturbing homogeneity.

In terms of compaction, workability can define the amount of useful work required to give full compaction.

Q19. Why do longitudinal cracks develop on concrete pavements?

The longitudinal cracks can be developed on concrete pavements due to several reasons. Some of these reasons are:

- late or shallow saw cutting of longitudinal saw cut joints
- inadequate base support under the concrete slab
- high level of built-in warping and curling
- the use of aggregates with a high coefficient of thermal expansion (CTE).

Q20. What is braced excavation?

Braced excavation is a method that supports the ground around foundation excavations where deep excavations with straight vertical faces are laterally supported by a sheeting and bracing system until the structure is built.

Q21. What is the indication of shear slump and collapse slump in slump tests?

Collapsed Slump: The ratio of water to cement is too high. It indicates the batch will not repair at the designed compressive strength

Shear Slump: It indicates the poor durability of concrete at 28 days. It further goes for a trial to test the cohesion of the mixture

Q22. What is the tallest man made structure in the world?

Burj Khalifa in Dubai is the tallest man-made structure in the world with a height of 2716 feet.

Q23. Why are steel plates inserted inside bearings in elastomeric bearings?

Steel plates are inserted to enhance the compression stiffness of elastomeric bearing. Steels plates restrict the bulging of the bearing ball. It also reduces the deflection and as a result tensile stress is induced. Conversely, it

limits the thickness of the steel plates

Q24. What are common methods of curing the concrete?

There are six methods of curing the concrete which is described below: -

- **Shading:** This method protects the concrete surface by locking the evaporation of water. It protects the surface from wind and heat. In cold conditions, it also prevents the surface from freezing.
- **Using wet gunny bags or paper:** To avoid water loss, wet gunny bags are used to cover the concrete surface.
- **Sprinkling water:** Water is sprinkled over the concrete surface with the help of a nozzle. In comparison with the above, this method is not very effective because it is really hard to keep the concrete moist all the time.
- **Ponding:** This method is very effective and it is used for curing the floors, pavements and slabs. This method occurs in three steps. Firstly, the concrete surface is covered with a moist wrapper for a day. After that, wrappers are removed and clay puddles are constructed around the area. At last, water is filled.
- **Membrane curing:** In this method, the concrete surface is covered with material like waterproof membranes, bitumen emulsion, rubber latex emulsion, water repellent, plastic films, wax etc. Covering these materials protects the surface from dehydration.
- **Steam curing:** Steam curing is the method in which the temperature of the concrete is increased in wet condition. Concrete can achieve its strength in a very short time and thus the process of curing can be finished earlier.

Q25. What is guniting?

The guniting is an extensively used process to repair the concrete work which has been damaged due to some reason like inferior work. It provides an impervious layer.

It is the most effective process to repair the damage in a structure that occurred due to inferior work or any other reason. It also provides an impervious layer to the structure. Guniting is made up of sand and cement. It is in the ratio of 3:1. A cement gun applied this mixture under a pressure of about 20 to 30 N/cm².

Guniting is useful in many applications like slope stabilization and rehabilitation purposes. Guniting can also be used for the construction of retaining walls. Tunnel construction, swimming pool construction and fluid tank construction

Q26. What is difference between slab and beam?

The differences between slab and beam are as follows:

S.
N. **Beam**

1. It is a linear structural element where perpendicular loads known as flex load are applied along with the axis.

Slab

It is a flexural component that distributes the load horizontally to one or more directions within a single plane.

S.
N. Beam

2. A beam is the most common example of a structural element in bending.
3. It is the most direct solution to the most common structural problems of transferring horizontal loads of gravity to the load elements.

Slab

While the resistance to bending of a slab is similar to that of a beam, it differs from that of a comparable series of independent beams in continuity in both directions.

A slab is used when concentrated loads result in a perpendicular bending located in the first direction of extension causing torsion in the slab.

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