

**UNIT-IV**  
**TECHNIQUES FOR REPAIR AND PROTECTION METHODS**  
**PART-A**

1. What is Vacuum concrete?

Only about half of the water added in concrete goes into chemical combination and the remaining water is used to make concrete workable. After laying concrete, water which was making concreting workable is extracted by a special method known as “vacuum method”.

2. What are the equipments used in vacuum concrete?

The equipment essentially consists of:-

- i. vacuum pump
- ii. water separator and
- iii. filtering mat

3. What is Guniting?

Guniting can be defined as mortar conveyed through a hose and pneumatically projected at a high velocity on to a surface.

4. What are the two types of process in Shotcrete?

- a. Wet mix process
- b. Dry mix process

5. What are the stages in dry mix process in shotcrete?

- i. In this process, the concrete is mixed with water as for ordinary concrete before conveying through the delivery pipeline to the nozzle, at which point it is jetted by compressed air, onto the work in the same way as that of wet mix process.
- ii. The wet process has been generally desired in favour of the dry mix process, owing to the greater success of the latter.

6. What is shotcrete?

Shotcrete is a recent development on the similar principle of gunite for achieving greater thickness with small coarse aggregate

7. What are the preliminary investigations before demolition of a structure?

The demolition contractor should have ample experience of the type of work to be offered;

- ☐ Fully comprehensive insurance against all risks must be maintained at all times;
- ☐ An experienced supervisor should be continuously in charge of the work;
- ☐ The contract price should include all safety precautions included in the relevant building regulations;
- ☐ The completion date should be realistic, avoiding and need to take risks to achieve the date.

8. Write about protective clothing given before demolition.

Buildings where chemicals have been stored or where asbestos, lead paint, dust or fumes may be present will require specialized protective clothing, e.g.

9. Give a brief note on shoring and underpinning in demolition.

The demolition contractor has a legal obligation to show technical competence when carrying out the work. When removing sections of the building which could have leave other parts unsafe, adequate temporary supports and shoring etc. must be provided.

10. What are the major factors in selecting a demolition procedure?

Majors factors to be considered in selecting an appropriate technique include:-

- Safety of personnel and public
- Working methods
- Legislation applicable
- Insurance cover

11. Give the categories of demolition techniques.

Demolition techniques may be categorized as:-

- ☐ Piecemeal demolition, using hand-held tools or machines, to reduce the height of the building or structure gradually;

- ☐ Deliberate controlled collapse, demolition to be completed at ground level.

12. Write short notes on demolition by hand.

Demolition of buildings or structure by hand-held tools such as electric or pneumatic breakers, sometimes as a preliminary to using other methods, should be carried out, where practicable, in the reverse order to the original construction sequence. Lifting appliances may be necessary to hold larger structural members during cutting and for lowering severed structural members and other debris.

13. In what cases demolition by machine can be done?

Simple roof structures supported on wall plates should normally be demolished to the level of wall plates by hand, but if this may involve unsafe working, then demolition totally by machine may be appropriate.

14. Write short notes on balling machine. Balling machines generally comprise a drag-line type crawler chassis fitted with a lattice crane jib. The demolition ball, with a steel anti-spin device, is suspended from the lifting rope and swung by the drag rope.

15. How are explosives used for demolition of a structure?

If explosives are to be used for demolition, the planning and execution, include pre-weakening, should be under the control of a person competent in these techniques. For large demolition, the competent person is likely to be an experienced explosive engineer; for smaller work, a shot-firer may be sufficient.

16. What is a hydraulic pusher arm?

Articulated, hydraulically-powered pusher-arm machines are normally mounted on a tracked or wheeled chassis, and have a toothed plate or hook for applying a horizontal force to a wall. The machine should stand on a firm level base and apply force by a controlled movement of the pusher arm.

17. What is pre-weakening?

Buildings and structures normally have structural elements designed to carry safely the loading likely to be imposed during their life.

As a preliminary to a deliberate controlled collapse, after loads such as furnishings, plant and machinery have been removed, the demolition contractor may be able to weaken some structural elements and remove those now redundant. This pre-weakening is essentially a planned exercise and must be preceded by an analysis of its possible effects on the structure until it collapses, to ensure that the structural integrity of the building is not jeopardized accidentally. Insufficient information and planning relating to the structure may result in dangerous and unsafe work

18. What is deliberate collapse?

The deliberate collapse of the whole or part of a building or structure requires particularly high standards of planning, supervisions and execution, and careful consideration of its effect on other parts of the structure or on adjacent buildings or structures. A surrounding clear area and exclusion zone are required to protect both personnel and property from the fall of the structure itself and debris which may be thrown up by the impact.

19. How can you develop a demolition strategy?

The strategy will need to take into account the method of construction used for the original building and its proximity to other buildings, structures and the general public. These factors, together with location, the cost and availability of tipping and disposal and the desirability and economics of reuse, must be taken into account in the development of an appropriate strategy for the demolition of a structure.

20. What are nibblers?

Nibblers use a rotating action to snap brittle materials such as concrete or masonry. In either case, material should be removed from the top of walls or columns in courses not greater than 600mm in depth, steel reinforcement should be cut separately as necessary.

21. What are the considerations before demolition?

Considerations should be given to:-

- ☐ Conducting a site and building survey, with a structural bias;
- ☐ The examination of drawings and details of existing construction where available;
- ☐ The preparation of details and drawings from site survey activities where no such information is available;
- ☐ Establishing previous use of premises, especially with regard to flammable substances or substances hazardous to health or safety;
- ☐ Programming the sequence of demolition work;
- ☐ The preparation of a Method Statement.

### **PART-B**

1. Briefly explain about vacuum concrete.
2. Explain in detail about Guniting.
3. Explain Rust Eliminators
4. Describe the preliminary procedures in demolition of a structure.
5. Explain the demolition process of a damaged structure.
6. Describe in detail about the various demolition techniques.
7. Describe in detail about the impulsion method of demolition of structures.