

TWO MARKS QUESTIONS AND ANSWERS

UNIT-I CONCRETE TECHNOLOGY

1. What is cement?

Cement is a substance which acts as a binding agents for materials .It is obtained by burning the mixtures of calcareous material such as lime stone and argillaceous materials such as clay at very high temperature.

2. What are activities normally followed during concreting?

- i. Batching
- ii. Mixing
- iii. Transporting
- iv. Placing
- v. Compacting
- vi. Curing

3. Define Screeding.

It is the leveling operation that removes lumps and hollows and provides a true and uniform concrete surface.

4. What are the methods of curing?

Depending upon the type of construction work , the concrete is cured by any of the following methods.

1. By ponding
2. By using wet sacks & sprinkling water frequently
3. By steam
4. By alternating current
5. By chemicals

5. What are the type of cement?

1. Acid-resistance cement
2. Blast-Furnace cement
3. Colored cement
4. Expanding cement
5. High alumina cement
6. Hydrophobic cement
7. Low heat cement
8. White cement

6. Manufacture of Portland cement.

There are three main operations involved in the manufacture of ordinary or Portland cement.

1. Mixing of raw materials
 - a)Dry process
 - b)Wet process
2. Burning
3. Grinding

7. What are the various type of testing for cement?

- a) Field Tests for cement
 1. Color test
 2. Physical properties
 3. Presence of lumps
 4. Strength

- b) Laboratory Tests for cement

1. Chemical composition
2. Fineness
3. Compressive strength
4. Tensile Strength
5. Consistency
6. Setting times
7. Soundness

8. Define workability.

Workability of concrete is defined as the ease with which can be mixed, transported and placed in position so that the concrete remains homogenous.

9. What are the factors affecting workability?

1. Water content
2. Mix proportions
3. Size and shape of aggregates
4. Grading of aggregate
5. Use of admixtures

10. What are the properties of cement?

The important properties of good cement are

- It gives strength to the masonry
- It is easily workable
- It is an excellent binding material
- It offers good resistance to the moisture.
- It should be free from lumps.
- It possesses a good plasticity.
- It stiffens or hardens easily.

11. What are the properties of cement concrete?

- It has high compressive strength.
- It is free from corrosion and there is no appreciable effect of atmospheric agents on it.
- It hardens with age and the process of hardening continues for a long time after the concrete has attained sufficient strength.

12. What are the Non-Destructive testing Methods?

- 1.1, Rebound hammer test Method
2. Pulse Velocity Method

13. Techniques of measuring pulse velocity through concrete.

1. Direct transmission
2. Indirect transmission
3. Surface transmission

14. Factors affecting the measurement of pulse velocity

1. Smoothness of contact surface under test
2. Influence of path length On pulse velocity
3. Temperature of concrete
4. Moisture condition of concrete
5. Presence of reinforcing steel.

15. Define Mix Design?

Mix design can be defined as the process of selecting suitable ingredients of concrete and determining their relative proportions with the object of producing concrete of certain minimum strength and durability as economically as possible.

16. What are the Object of Mix design?

The first object is to achieve the stipulated minimum strength and durability. The second object is to make the concrete in the most economical manner.

17. What are the various method of proportioning?

1. Arbitrary proportioning
2. Fineness modulus method
3. Maximum density method
4. Surface area method
5. Indian Road Congress ,IRC 44 method
6. High strength concrete mix design
7. Mix design based on flexural strength

18. What is concrete chemicals?

Chemicals are not used as admixtures but used to enhance the performance of concrete, or used in concrete relative activities in the field of construction. Such chemicals are called concrete chemicals.

19. Name some concrete chemicals?

1. Concrete curing compound.
2. Polymer Bonding agent
3. Mould Releasing agent
4. Floor hardeners and Dust proofers
5. Guniting Aid

20. What are the Vibrators used for compacting?

1. Internal or immersion Vibrators
2. Surface Vibrators
3. Vibrating table.

UNIT-II CONSTRUCTION PRACTICES

1. Define specification

The drawings of a structure will show the proportions and relative positions of its various parts. It is not possible to furnish the data regarding the quality of material and workmanship on the drawing due to the shortage of space. Hence, this information regarding the quality of materials and workmanship is conveyed in a separate document, which is known as specification.

2. Define masonry. What are the types of stone masonry?

Masonry is defined as the construction of building units bonded together with mortar. The building units may be stones, bricks or precast blocks of concrete. Depending upon the type of building units used, masonry may be of the following types

1. Stone masonry
2. Brick masonry
3. Hollow concrete blocks masonry
4. Reinforced brick masonry
5. Composite masonry

3. Define the following terms

- Course - It is a horizontal layer of masonry unit.
- Header - It is a full stone unit or brick which is so laid that its length is perpendicular to the face of the wall.

Stretcher – It is full stone unit or brick which is so laid that its length is along or parallel to the face of the wall.

Header course - A course of brick work showing only headers on the exposed face of the wall are known as header course or heading course.

4. Compare English bond and Flemish bond

- English bond is stronger than Flemish bond for walls thicker than $1\frac{1}{5}$ brick
- Flemish bond gives more pleasing appearance than the English bond
- Broken bricks can be used in the form of bats in Flemish bond. However, more mortar is required
- Construction with Flemish bond requires greater skill to comparison to English bond

5. State the advantages of hollow concrete block masonry

- Concrete blocks are regular in size, requiring no dressing work. Hence construction is very rapid.
- Blocks are light and therefore easy to handle.
- There is great saving in the material.
- Hollow blocks are structurally stronger than bricks.
- Thinner walls can be easily constructed, resulting in increase in the floor area.

6. What are the factors affecting the choice of a flooring materials

- Initial cost
- Appearance
- Cleanliness
- Durability
- Damp resistance
- Sound insulation
- Smoothness
- Hardness

7. What are the various types of flooring?

- Mud flooring and muram flooring
- Brick flooring
- Flag stone flooring
- Cement concrete flooring
- Terrazzo flooring

8. What are ill effects of dampness in buildings?

The following are ill effects of entry of dampness

- Dampness gives rise to breeding of mosquitoes and create unhealthy living conditions
- Travel of moisture through walls and ceiling may cause unsightly patches
- Moisture travel may cause softening and crumbling of plaster, specially lime mortar
- The wall decoration is damaged, which is very difficult and costly to repair

9. Briefly explain the expansion joints

These joints are provided to allow the expansion of the slab due to rise in slab temperature. Expansion joints also permit construction of the slab and help to reduce the warping stresses. The gap width for this type of joint is 20mm to 25mm

10. State briefly the requirements of good foundation?

Foundation should be constructed to satisfy the following requirements

- The foundations shall be constructed to sustain the dead and imposed loads and to transmit these to the sub-soil in such a way that pressure on it will not cause settlement which would impair the stability of the building or adjoining structures.
- Foundation base should be rigid so that differential settlements are minimized, specially for the case when super-imposed loads are not evenly distributed.
- Foundation should be taken sufficiently deep to guard the building against or distress caused by swelling or shrinkage of the sub – soil
- Foundations should be located that its performance may not be affected due to any unexpected future influence.

11. What are the types of foundations?

Foundations may be broadly classified under two heads

1. Shallow foundations

- (a) Spread footings
- (b) Combined footings
- (c) Strap footings
- (d) Mat foundation

2. Deep foundations

- (a) Pile foundation
- (b) Pier foundation
- (c) Caisson or well foundation

12 What is meant by shoring? What are the types shoring?

Shoring is the construction of a temporary structure to support temporarily an unsafe structure. Shores may be of the following types

1. Raking Shores
2. Flying Shores
3. Dead shores

13. State briefly the essential requirements of a good roof

- It should have adequate strength and stability to carry the superimposed dead and live loads
- It should effectively protect the building against rain, sun, wind, etc and it should be durable against the adverse effects of these agencies.
- It should be water proof, and should have efficient drainage arrangements.
- It should be fire resistant

14. Differentiate between comfort air conditioning and industrial air conditioning.

Comfort air conditioning – In this, the system aims at giving maximum human comfort to the occupants/users of the conditioned space.

Industrial air conditioning – In this, the conditioning creates, controls and maintains such an environment inside the conditioned space, that would suit best to the needs of the industry

15. Define air conditioning

Air conditioning may be defined as the process of treating air so as to control simultaneously its temperature, humidity, purity and distribution to meet the requirements of the conditioned space.

16. What are the requirements of a good acoustic material?

- It should have high coefficient of absorption
- It should be efficient over a wide range of frequencies
- It should be relatively cheap and easily available
- It should give pleasing appearance after fixing
- It should be self supporting, and should afford easy fixing

17. What are the causes of fire?

Most fires are caused by carelessness. Common instances of carelessness are.

- Careless discarding of lighted ends of cigarettes, matches etc
- Smoking in unauthorized places.
- Indifferent maintenance of machinery including overloading and under or over lubricating of bearings
- Incorrect storage of materials
- Un- approved equipment and layout

18. Write a short note on fire hazards

Fire safety of buildings should be considered from three aspects

- 1) Possibility of loss or damage to life, referred to as personal hazard
- 2) Possibility of fire occurring and spreading inside the building itself, referred to as internal hazard

- 3) Possibility of fire spreading from an adjoining building or buildings or from across a street or road, referred to as exposure hazard.

19. State briefly the essential requirements of form work

A good form work should satisfy the following requirements

- It should be strong enough to withstand all loads coming on it, such a dead load of concrete and live load during its pouring, compaction and curing.
- It should be stiff enough so that deflection is minimum
- It should be as light as possible
- This form work should rest on non –yielding supports

20. What is meant by deshuttering?

It is the process of removal of formworks after the maturity period of concrete.

21. Classify various types of stone masonry

Depending upon the arrangement of stones in the construction degree of refinement used in shaping the stone and finishing adopted stone masonry can be classified as follows.

- (a) Rubble Masonry
- (b) Ashlar Masonry

UNIT-III SUB STRUCTURE CONSTRUCTION

1. What is meant by diaphragm wall?

Diaphragm wall are structure elements, which are constructed underground to prevent the seepage into the excavated area.

2. What are the common uses of diaphragm wall walls?

- ✓ To provide structural support for the construction
- ✓ To provide retaining wall
- ✓ To provide deep diaphragms

3. List out the advantages of tunnel boring machines

- ✓ There is very less danger of fall outs in machine bored tunnels, since adjacent or surrounding rocks are undistributed as no blasting is done.
- ✓ Mucking is also safe and convenient, since muck is conveyed from the face to the rear of the machine and is loaded automatically by means to the rear of the machine and is loaded automatically by means of belt conveyors.
- ✓ Higher speed of excavation.
- ✓ Reduction in the tunnel supports requirement.
- ✓ Less manpower requirement.

4. List out the types of well point systems

1. Pumping from open sumps
2. Pumping from well points

Well point systems are installed in two ways:

- a) Line system
 - b) Ring system
3. Pumping from bored wells

5. List out the types of piles

- (a) Driven piles – Timber, recast concrete, Prestressed concrete, steel H-section, Box and tube
- (b) Driven and cast-in place piles
- (c) Bored piles
- (d) Composite piles

6. What are problems normally developed during deep excavations?

- To prevent the collapsing of sides of the trenches
- To prevent water oozing or coming out from the sides and bottom of the trenches

7. What are the remedial measures to avoid the problems deep excavation?

- Providing shoring for the trenches
- Dewatering of the trenches

8. What is caisson? What are the types of caisson?

Caisson has come to mean a box like structure, round or rectangular, which is sunk from the surface of either land or water to some desired depth. Caissons are of three types:

- (a) Box caisson
- (b) open caisson
- (c) Pneumatic caissons

9. What do you mean by Sheet piles?

Sheet piles are thin piles, made of plates of concrete, timber or steel, driven into the ground for either separating members or for stopping seepage of water. They are not meant for carrying any vertical load. They are driven into ground with help of suitable pile driving equipment, and their height is increased while driving, by means of addition of successive instalments of sheets.

10. Write the functions of sheet piles

1. To enclose a site or part thereof to prevent the escape of loose subsoil, such as sand, and to safeguard against settlement.
2. To retain the sides of the trenches and general excavation.
3. To protect river banks.

11. List out the types of cofferdam

1. Cantilever sheet pile cofferdam
2. Braced cofferdam
3. Embankment protected cofferdam
4. Double wall cofferdam
5. Cellular cofferdam

12. What is a box caisson?

A box caisson is open at top and closed at the bottom and is made of timber, reinforced concrete or steel. This caisson is built on land, then launched and floated to pier site where is suck in position. Such a type of caisson is used where bearing stratum is available at shallow depth, and where loads are not very heavy.

13. What is line system? With neat sketches

This system is employed when excavation area is long. The header is laid out along the sides of the excavation, and the pumping is continuously in progress in one length as further points are jettted ahead of the pumped down section and pulled up from the completed and back filled lengths and repeated till entire length is completed. For narrow excavation, like trenches, header is laid only on one laid, while for wide excavations, the header are required to be placed on both sides of the area

14. What is ring system? With neat sketches

When excavation is done in area of appreciable width, line system is inadequate. The ring system is used in such condition and the header main surrounds the excavations completely. This system is used for rectangular excavations such as for piers or basements.

15. Where are grout anchors used in constructions?

In most cases, however anchorages may be embedded below ground level, with backstays connecting them to adjacent towers, or they may constitute the end abutments of the end spans. In addition to stability sliding, the anchorage structure must also be checked for stability against tilting and overturning.

16. What is Dewatering?

Dewatering is the removal of water from solid material or soil by wet classification, centrifugation, filtration, or similar solid-liquid separation processes, such as removal of residual liquid from a filter cake by a filter press as part of various industrial processes

17. What is cofferdam?

A type of water-tight enclosure used to create a dry foundation for building bridges and other structures over water

18. Where is method of Underpinning?

1. Pit Method
2. Pile Method
3. Miscellaneous Method

UNIT-IV SUPER STRUCTURE CONSTRUCTION

1. List out the types of domes?

1. Ribbed domes
2. Schwedler domes
3. Three way grid domes
4. parallel lamella domes
5. Geodesic domes

2. What are the erection methods of domes?

The erection of the domes can be done by following methods

1. Element method
2. Block method
3. Lift up method

3. List out the components of cable stayed bridges?

1. Inclined cable
2. Towers
3. Orthotropic deck

4. What are the erection methods of launching of heavy deck?

1. Balanced cantilever erection method
2. Progressive placing method
3. Span by span (or) Steeping form work method
4. Incremental launching method

5. What are the types of shells?

1. Barrel shells
2. Butterfly shells
3. Continuous cylindrical shells
4. Corrugated shells
5. Cylindrical shells
6. Multiple cylindrical shells
7. North light cylindrical shells

6. What are the methods of transporting light weight component?

There are totally four methods of transporting light weight components on tall structures

1. Cable ways
2. Rope ways
3. Belt conveyors
4. Hoists

7. List out the advantages of cable suspension bridges?

1. They require only cables and small light pieces of other materials
2. They can therefore be made of very large spans in place where, owing to the difficulty of transport, no other form of bridge would be economically feasible
3. They are most suitable for rocky gorges where intermediate supports are difficult to construct
4. They are light in weight
5. They present better architectural effect
6. The construction of towers in bed of river is avoided

8. List out the types of cable suspension bridges?

A suspension bridge with light load does not require stiffening. Under heavy loads the cable have to be stiffened so that they may not be put to large changes in shape.

1. Unstiffened suspension bridge
2. Stiffened suspension bridge

9. What are the problems occurs in construction of cooling towers?

Some of the problems related to cooling towers include

1. Corrosion of towers
2. Scale formation
3. Clogging of nozzles
4. Fouling

10 List out the advantages of aerial rope ways?

1. Shortest route is taken which consumers less time
2. The loads can be automatically discharge at any height
3. Extremes of weather do not affect the operation
4. Ropeways with sufficient down grade in flavour of the load run without any consumption of power

11. List out the advantages of block method

Advantages

1. Better work control as erection work at high level can be maintained
2. Work efficiency can be enhanced

12. List out the disadvantages of block method

Disadvantages

1. Provision of special device for marking fine adjustments and assembling
2. Longer during for high level work
3. The use of temporary jig is indispensable for securing high precision in ground assembly

13. List out the advantages of element method

Advantages

1. **Little wastage in the transportation of the members**
2. No facility needed for ground assembly
3. Large spans can be easily constructed light hoisting equipment

14. List out the disadvantages of element method

Disadvantages

1. When height of the work increase the cost of temporary support increases
2. Also increase the work safety

15. What are the types of geodesic domes?

1. Frame single layered domes
2. Truss or double layered domes
3. Stressed skin domes
4. Formed surface domes

16. What are articulated structure?

A structure in which relative motion is allowed to occur between parts, usually by means of a hinged or sliding joint or joints

17. What are skyscrapers?

A skyscraper is a tall, continuously habitable building. There is no official definition or height above which a building may clearly be classified as a skyscraper

18. Define offshore platforms

The comparatively flat region of submerged land extending seaward from beyond the region where breakers form to the edge of the continental shelf.

19. What are applications of a clamshell?

- i. Where digging or dumping in a vertical plane i.e., below, at or above ground level is required
- ii. Where material is relatively soft or medium hard
- iii. For digging trenches
- iv. For charging the materials in a bin or a stock pile
- v. Where accurate dumping is required

20. What are the factors affecting the output of a scraper?

- i. Size and mechanical condition of the scraper
- ii. Hauling distance
- iii. Condition of the haul road
- iv. Characteristics of soil and work area
- v. Efficiency

UNIT-V CONSTRUCTION EQUIPMENT

1. What are the factors to be considered while selecting a tractor?

- Size of the dozer for a given job
- The type of work expected from the tractor dozer
- Example: bulldozing, ripping, land clearing, pulling a scraper
- The type and condition of hauled road
- Gradient of the haul road
- Distance to be moved
- Type of work expected to be taken from the equipment after the present job is completed

2. What are the advantages of crawler tractors?

- More tractive effort, hence can also operate on loose or muddy soil.
- In absence of tyres, can easily operate in rocky conditions, as there is no danger for the damage of the tyres.
- Where maintenance of haul roads is difficult, it can be easily travel, specially in rough terrains
- Crawler tractors are more compact and powerful and hence can handle difficult jobs as well

3. What are the advantages of wheeled tractors?

- Can travel at higher speeds during the operation and also from one job to another
- Can travel long distance at its own power, whereas crawler mounted needs trailers
- When work is spread over long area, these are found to be producing more output.
- Ease in operation. Operator feels less fatigue.

4. What are the applications of a bulldozer?

- Land clearing
- Stripping
- Side hill cuts
- Ditching
- Spreading
- Dozing rocks and frozen ground
- Maintaining haul roads

5. What is a scraper?

Scrapers are the device to scrap the ground and load it simultaneously, transport it over the required distance, dump at desired place and then spread the dumped material over the required area in required thickness level, and return to the pit for the next cycle.

The scrapers are of three types

- (a) Towed type
- (b) Self propelled or motorized
- (c) Self loading or elevating scraper

6. What are the advantages of elevating scraper?

- Better loading ability in loose free flowing materials
- Good finishing ability
- Can be operated independently
- Pusher tractor dozer is not required
- Smooth and complete unloading of bowl by reversing the elevator rotation.
- Pulverizing and mixing action by the elevator places material in uniform and homogeneous state for compaction

7. List out the types of excavators.

Excavators are of following four types based on the type of carriers on which they are mounted

1. Crawler mounted excavator
2. Truck mounted excavator
3. Self propelled
4. Excavators barge or rail

8. What are the advantages of trencher?

- It is faster and cheaper method of trenching
- It digs only as much as is necessary. A 10cm pipe can be installed in a 15cm wide slot cut by a trencher
- It is a continuous process and is not like that of backhoe excavator i.e. dug lift-dump
- Horizontal distance to be covered
- ontal distance to be covered
- Time period of lifting operations
- Utilization factors and
- Degree of mobility required

9. List out the construction equipment.

- Bull Dozers
- Graders
- Skimmers
- Scrapers
- Loaders

10. Write short note on skimmers.

These excavators are rigged using a universal power unit for surface stripping and shallow excavation work up to 300 mm deep where a high degree of accuracy is required. They usually require attendant haulage vehicles to remove the spoil and need to be transported between sites on a low loader. Because of their limitations and the availability of alternative machines, they are rarely used today.

11. What is dredging?

Dredgers are used for excavation from riverbed, lake or sea for purpose of deepening them. Dredging is an important operation in navigation canals, harbours, dams etc.

12. What is motor grader?

Motor graders are used for leveling and smoothing the earthwork, spreading and leveling the base courses in the construction of roads and airfield. It can be used for land reclamation, snow clearance, gravel road repairing, mixing of stabilizing materials such as tar, asphalt, cement and lime, maintaining quarry roads etc.

13. List out the material handling devices

1. Lifting and lowering devices (Vertical motion)

- (a) Block and tackle
- (b) Winches
- (c) Hoists
- (d) Elevators
- (e) Pillar crane
- (f) Overhead cranes

2. Transportation devices (horizontal motion)

- (a) Wheel barrows and hand truck
- (b) Narrow-gauge mine rail road
- (c) Tractors and trailers
- (d) Skids
- (e) Pipe line

3. Combination devices (Lifting and lowering plus Transportation)

- (a) Spiral chute
- (b) Lift track
- (c) Crane truck
- (d) Forklift truck
- (e) Conveyors of various types

4. Aerial transport

- (a) Cable ways
- (b) Rope ways

14. How pumps are classified? Give example.

Pumps are of following types

1. Positive displacement pumps: These may be

- (a) Reciprocating pumps
- (b) Rotary pumps: These may be gear pumps, vane pumps, screw pumps etc

2. Rotodynamic pumps: These may be volute pumps, circular pumps, diffuser pumps, vertical turbine pumps, and centrifugal mixed flow and propeller types of pumps.

15. What is meant by ‘Transit mixer’?

- Dry mix material are fed into the truck mixers for a dry batching plant, after measuring the quantities of various constituents other than water, i.e. aggregate, sand and cement.
- Transit mixers transport it to the work site and mix it during the journey using its own water supply. These transit mixers are provided with a suitable water system having sufficiently large water tank, a meter and a pump for supplying water for mixing and cleaning the drum.

16. What are the factors affecting the selection of a drilling equipment?

Major factors affecting the selection of drilling equipment are mentioned hereunder:

- (a) Nature of terrain
- (b) Required depth of holes
- (c) Rock hardness
- (d) The purpose for which holes are required to be drilled i.e fro blasting or grouting or for exploration purposes.
- (e) The size of the project.

17. What are applications of a hoe?

- i. For digging trenches, footings or basements
- ii. To dug materials which are hard
- iii. Where close trimming is required during excavation
- iv. Where excavation is required below the ground level and then dumping is done at a short range.

18. List out the applications of a motor grader.

- i. Land clearance
- ii. Snow clearance
- iii. Material mixing