Important Engineering Question and Answer

Question 1
What are the different types of slumps of concrete?

⇒ a. True slump,

b. Shear slump,

c. Collapse slump

Question 2
What is the slump value of concrete for normal RCC work?

⇒ It is 80 to 150 mm for normal RCC work and 25 to 50 mm for mass concreting.

Question 3
What are the various steps involved in the process of concreting?

⇒ a. Batching

b. Mixing

c. Transportation

d. Placing

e. Compaction

f. Finishing

g. Curing

Question 4
What should be the minimum value of concrete cover?

⇒ It should not be less than double the stirrup bar diameter.

Question 5
Why is the concrete cover value for different RCC Members?

⇒

a. Slab = 20 mm

b. Beam = 25 mm

c. Column = 40 mm

d. Footing = 50 mm

Question 6
What is the standard size of a concrete cube?

⇒ 150mm × 150 mm × 150 mm

Question 7
How many cubes are filled for 1 cubic meter of concrete?

⇒ 1 sample = 3 cube

1-5cum = 1

6 – 15 cum = 2

16 – 30 cum = 3

31 – 50 cum = 4

50 cum and above = 4 plus one additional sample for each 50 additional cum.

Question 8
How much concrete gains strength after seven days?

⇒ 7 days – 65%

Question 9
What is the soundness of cement?
⇒ It is a property that makes sure the cement does not show any considerable expansion once it has been set.

Question 10
What are the names of different tests to check the concrete quality?
⇒ On fresh Concrete

a. Workability

b. Air Content

c. Setting Time

On hardened Concrete

a. Compressive strength

b. Tensile strength

c. Modulus of Elasticity

d. Permeability test

e. In situ test

Question 11
What is the specific gravity of OPC cement?
⇒ 3.1 to 3.16 grams per cubic centimeter

Question 12
What is the specific gravity of PPC cement?
⇒ 3.08 g/cc

Question 13
What are the different field tests of cement?
⇒ Color test, float test, presence of lumps, Manufacturing date, Inside Temperature.

Question 14
How many days of cement last long?
⇒ Three months

Question 15
What is the normal consistency of OPC Cement?
⇒ 25 to 35%

Question 16
What should be the PH value of water used in concrete?
⇒ No less than 6

Question 17
What is the Idle temperature for concreting?
⇒ It should be 26.7°C to 35°C As per the ASTM C1064 code.

Question 18
What is grouting?
⇒ Grouting may be defined as the is the process of inserting material into cavities, concrete cracks, rock mass, soil, and masonry structure to increase their load-bearing capacity. The material used for this work is known as grout. Or It is a concrete fluid form applied to fill up the voids.

Question 19
What is shotcrete?
⇒ Shotcrete is the process of spraying and depositing very fine concrete or mortar onto a prepared surface by jetting it with high velocity.

Question 20
What are the different types of shotcrete processes?
⇒ a. Dry Mix Process
b. Wet Mix process

Question 21
What is Gunting?
⇒ The dry mix shotcrete process is called Guniting.

Question 22
Which material is used for filling cracks in masonry structures?
⇒ Plastic Bitumen

Question 23
Which machine is used for testing the compressive strength of concrete?
⇒ UTM (Universal Testing Machine)

Question 24
What is a honeycomb in concrete?
⇒ Honeycombs are voids or cavities on concrete formed due to mortar not filling the spaces between the coarse aggregate particles.

Question 25
What is a projection line?
⇒ A projection line is a way in which the earth is presented on a flat piece of paper.

Question 26
What should be the slope of the staircase?
⇒ 25° to 40°As per IS 456

Question 27
What should be the size of the tread and riser for residential and commercial buildings?
⇒ For residential = Trade 250 mm, riser- 160mm
For commercial = Trade – 270 to 300 mm, Riser = 130 to 150 mm

Question 28
How can we check the level on a construction site?
⇒ We can check the level on the construction site with the help of the spirit level, auto level, and level pipe.

Question 29
What is the minimum reading that we can read on dumpy-level staff?
⇒ 5 mm

Question 30
What is the Full form of BHK?
⇒ Bedroom, hall, and kitchen

Question 31
What is the Full Form of FAR?
⇒ Floor Area Ratio

Question 32
What is the formula of FAR?
⇒ FAR = Total covered area of all floors of the building/ plot area

Question 33
How many levels are involved in the construction of a building?
⇒ NGL, GL, FGL, Plinth level, FFL, Sill Level, Lintel Level

Question 34
What should be the compressive strength of First-class Brick?
⇒ It should not be less than 105 kg/cm2

Question 35
What is the standard size of a Brick?
⇒ 19 × 9 × 9 cm

Question 36
What various tests are done to check the quality of Bricks?

⇒ a. Crushing strength
b. Water absorption
c. Shape, and size
d. Hardness
e. Efflorescence
f. Soundness
g. Color
h. Structure

Question 37
What are the different types of bonds used in brick masonry?
⇒a. Header bond
b. Stretcher bond
c. English bond
d. Flemish bond

Question 38
What are the types of Stonemasonry?

⇒ a. Rubble Masonry
b. Ashlar Masonry

Question 39
What should be the standard height of the Floor?
⇒ 3 meters

Question 40
What are the different types of foundations?
⇒ Shallow Foundation, Deep Foundation

Question 41
When is Pile Foundation used?
⇒ When the soil bearing capacity is less than 24 kN/m3

Question 42
What is the bearing capacity of soil?
⇒ It is the soil's ability to bear the load coming over its unit area without causing unreasonable settlement.

Question 43
What is the Full Form of DPC?
⇒ Damp Proof Course

Question 44
What is soil stabilization?
⇒ It is the process that improves the physical properties, such as increasing the shear strength, bearing capacity, resistance to erosion, dust formation, and frost heaving.

Question 45
What are the standard methods of demolition?
⇒ a. Hydro-demolition
b. Pressure Bursting
c. Dismantling

Question 46
What is the minimum curing period for concrete?
⇒ As per IS 456 – 2000, Seven days with OPC Cement and ten days If exposed to hot weather.

Question 47
What is the allowable % of silt in the sand?
⇒ It should not be more than 6%

Question 48
What is the value of the fineness modulus of sand?
⇒ It ranges between 2.2 to 3.2
Fine sand = 2.2 to 2.6
Medium Sand = 2.6 to 2.9
Course sand = 2.9 to 3.2

Question 49
What is the size of sieves used in the finesse modulus of the sand test?

⇒ 4.75mm, 2.36mm, 1.18mm, 0.6mm. 0.3mm, 0.15mm

Question 50
What should be the thickness of the internal plaster?
⇒ Internal Plaster = 12 mm and External Plaster = 15 to 20 mm

Question 51
What should be the minimum thickness of the Slab?
⇒ 125 mm

Question 52
What is the Carpet area?
⇒ An area on which we can spread a carpet or net useable space refers to a carpet area.

Question 53
What is the built-up area?
⇒ Built-up Area = Carpet area + External Walls + Balconies + Service Shaft
Usually, it is 10% more than the carpet area.

Question 54
What is a super built-up area?
⇒ Super built-up area = Built-up area + common areas
Usually, it is 10 to 40% more than the carpet area.

Question 55
What is the de-shuttering time for the column?
⇒ 16-24 hours

Question 56
What are the different grades of HYSD bars?
⇒ Fe 250, Fe 415, Fe 500

Question 57
What is 415 in Fe415?
⇒ Tensile strength in N/mm2 of the bar.

Question 58
What is the formula to calculate the unit weight of steel bars?
⇒ D2/162.2

Question 59
What is the density of steel?
⇒ 7850 kg/m3

Question 60
What is the full form of a TMT bar?
⇒ Thermo-mechanically treated Bar

Question 61
What are the advantages of TMT steel?
⇒
High yield strength
Good weldability
Great ductility
Better corrosion resistance

Question 62
What is the maximum allowed height for free fall of concrete?
⇒ Not more than 1.5 meters

Question 63
What is the minimum diameter of bars for columns?
⇒ 12 mm

Question 64
What is the minimum diameter of the bar for stirrups?
⇒ 8 mm

Question 65
How many bars should be provided in a circular column?
⇒ Minimum 6 numbers

Question 66
What are the various methods of RCC Design?
⇒ Working stress Method
Ultimate load method or load factor method
Limit state method

Question 67
Why are stirrups provided in columns?
⇒ To hold the main bar and resist shear stress.

Question 68
What is the Full form of BBS?
⇒ Bar Bending Schedule

Question 69
What is the value of Hook length?
⇒ 9d or 75 mm

Question 70
What is the value of the crank length for the slab?
⇒ 0.45D, where D is the depth of the slab

Question 71
What is lap length?
⇒ The length used to overlap two bars to transfer stresses from one bar to another safely refers to lap length.

Question 72
What is the value of lap length?
⇒ For compression = Equal to Ld (development length) but not less than 24d
For Tension
Flexural Tension = Ld (development length) or 30d which is greater
Direct Tension = 2Ld (development length) or 30d which is greater
d = diameter of bar

Question 73
What is the development length?
⇒ The minimum length of the bar is required to be embedded in concrete to safely transfer stresses from the bar to the concrete.

Question 74
What is the difference between development length and lap length?
⇒ Lap length transfer stresses from one bar to another, whereas development length transfers stress from steel bars to concrete.

Question 75
What is the general % of steel for different RCC members?
⇒ For lintel, slab = 0.7 – 1.0 %
For Beam = 1.0 – 2.0 %
For Column = 1.0 – 5.0 %
For Footing = 0.5 to 0.8%

Question 76.
How can you determine if a slab is one-way or two-way?
⇒ If the longer span to shorter span ratio is greater than two = One-way slab
If the longer span to shorter span ratio is less than or equal to two = Two-way slab.

Question 77

What are the various diameter bars used in construction?

⇒8mm
10mm
12mm
16mm
20mm
25mm
32mm
40 mm

Question 78

Which diameter bar lapping should not be allowed?

⇒ If the bar diameter is more than 36 mm, lapping should not be allowed.

Question 79

What is the suitable lapping zone for the beam?

⇒ For top reinforcement at mid-span
For bottom reinforcement – near the end of the beam or l/4 distance from the column face.

Question 80

What is the suitable lapping zone for the column?

⇒ Midsection of the column

Question 81

What should be the spacing of the chair?

⇒ Maximum 1 meter or one number per square meter

Question 82

What should be the minimum diameter of reinforcement for the chair?

⇒ No less than 12 mm

Question 83

Why is steel used with concrete?

⇒ Because steel has better bonding with the concrete, it expands and contracts at the same rate due to temperature.

Question 84

What is Shear Force?

⇒ It is a force acting in the direction parallel to the body's cross-section or surface. Such as air pressure flow over an airplane wing.

Question 85

What is Bending Moment?

⇒ It is a reaction induced in the structural member due to the externally applied force, causing the member to bend.

Question 86

What is a Negative Bending moment?

⇒ A moment that produces tension on the top part and compression at the bottom part of a beam is called the negative bending moment.

Question 87

What is a Moment of Inertia?

⇒ It expresses a body's tendency to oppose angular acceleration.

I = L/w

I = Inertia

L = angular momentum

W = angular velocity.

Question 88

What are the equations of Equilibrium?

⇒ $\Sigma Fx = 0 = 0$, $\Sigma Fy = 0$ and $\Sigma M = 0$.

Question 89

What is a zero-force member?

⇒ It is a structural member in a truss that is neither in tension nor in compression and doesn't support any loading but helps in the stability of the truss.

Question 90

How many types of beams are based on supports?

⇒ There are 5 types of beams based on supports as follows:

a. Simply supported

b. Cantilever

c. Overhanging

d. Continuous

e. Fixed

Question 91

How can you identify zero-force members?

⇒ **At two-member joint**

If two non-collinear members meet at a joint that doesn't have any load, both are zero-force members.

At three-member joint

When three members of the truss meet at the joint that doesn't have any load, two of which are collinear, and the third member is a zero-force member.

Question 92
What are the various types of load?

⇒ The various types of load are as follows:

a. Concentrated or point load

b. Uniformly Distributed Load (UDL)

c. Uniformly Varying Load (UVL)

Question 93

What is reinforced concrete?

⇒ Reinforced concrete has steel bars or mesh in them, which gives extra strength to the construction.

Question 94
What is the Slenderness ratio?
⇒ The ratio of structural elements (column) length to its least radius of gyration.

Question 95
Where does the maximum bending moment occur on a beam?
⇒ Where shear force changes sign

Question 96
What it is called If the material has all identical properties?
⇒ Isotropic

Question 97
Where does the maximum bending moment occur on a fixed-end beam due to a moving load?
⇒ At supports

Question 98
Where does the maximum bending moment occur on a cantilever beam?
⇒ Maximum at the fixed end and zero at the free end.

Question 99
What is the Point of Contrafexure?
⇒ The point at which the bending moment changes sign +ve to -ve or vice versa is called the point of contra flexure.

Question 100
What is the value of bending moment at the point of contra flexure?
⇒ Zero

Question 101
How can you determine a bending moment is positive or negative?
⇒ With the help of sign convention, the clockwise moment is positive, and the anticlockwise moment is negative. Its direction is opposite to the direction of the force.

Question 102
How many types of supports are used in the Structure?
⇒ There are 4 types of support as follows:
Simple Support
Pinned Support
Roller Support
Fixed Support

Question 103
what is equal to the rate of change of bending moment?
⇒ Shear force

Question 104
What is the modulus of rigidity?
⇒ The shear stress to shear strain ratio is known as the modulus of rigidity.

Question 105
What is the density of sand?
⇒ Dry =1600 kg/m3
River Sand = 1760 to 2000 kg/m3

Question 106
What is the density of aggregate?
⇒ 2400 – 2900 Kg/m3

Question 107
What is the density of brick?
⇒ 1600 to 1920 Kg/m3

Question 108
How many cement bags are in one cubic meter?
⇒ 28.8 bags

Question 109

How can you calculate the volume of concrete?

⇒ It can be determined by multiplying the length, width, and height or depth of the member.

Question 110

How can you calculate materials quantity for M15 grade concrete?

⇒ It can be determined with 1.54 divided by the sum of M15 grade concrete ratio(1:2:4).

1.54/7 = 0.22 cum

Cement = 0.22 × 1 = 0.22 cum

Sand = 0.22 × 2 = 0.44 cum

Aggregate = 0.22 × 4 = 0.66 cum

Question 111

What is 1.54?

⇒ It is the dry volume of one cubic meter of concrete.

Question 112

What is the full form of BOQ?

⇒ Bill of Quantities

Question 113

What is an estimate?

⇒ It is a probable work cost usually prepared before the construction start.

Question 114

What are the types of estimates?

⇒ There are 8 types of estimates as follows:

a. Approximate or rough estimate

b. Cubical Content estimate

c. Detailed estimate

d. Quantity estimate

e. Revised estimate

f. Annual repair and Annual Main tenancy estimate

g. Supplementary estimate

h. Extension and improvement estimate

Question 115

What are contingencies?

⇒ It refers to the incidental expenses of a miscellaneous character that can't be classified under any specific item.

A provision of 3 to 5% of the estimated cost is provided to meet the cost of unexpected items.

Question 116

What is work charged establishment?

⇒ It refers to the establishment which is charged to work directly. 1.5 to 2 % of the estimated cost is provided to avoid excess of the administratively approved estimate.

Question 117

What is rate analysis?

⇒ It is the process of fixing the rate of an item which is known as rate analysis.

Question 118

What is SOR?

⇒ A schedule or rates list of different work items is prepared after analyzing the rate of these items. This document is called the **schedule of rates**.

Question 119

What are the different methods of building estimates?

⇒ These 2 methods of building estimates as follows:

a. Longwall short wall method

b. Centreline method

Question 120

What is the full form of DPR?

⇒ Detailed Project Report

Question 121

What is the formula to calculate the volume of trapezoidal footing?

⇒

$V = H/3 (1 + A2 + \sqrt{A1 \times A2})$

A1 = Area of lower part

A2 = Area of upper part

H = Height of trapezoidal

Question 122

What is QA & QC?

⇒ Quality Assurance means the implementation of proactive methods that propose to prevent defects.

Quality Control means the method of examining the output to identify defects and correct them.

Question 123

What is Surveying?

⇒ The branch of science helps determine the relative positions above or beneath the earth's surface through direct and indirect measurements of distance, direction, and elevation.

Question 124

What are the primary two divisions of surveying?

⇒ The primary 2 divisions of surveying are as follows:

a. Plane Surveying

b. Geodetic Surveying

Question 125

What is the principle of surveying?

⇒ Always work from the whole to the part.

Location of a point by measurement from two points of reference.

Question 126

What is the various instrument used for linear measurement?

⇒ Chain, tape, arrow, Pags, ranging rod, offset rods, plumb Bob

Question 127

What are the various types of chains practiced in surveying?

⇒ The various types of chains practiced in surveying are as follows:

a. Metric chain

b. Surveyor chain

c. Gunter's chain

d. Engineer's chain

e. Revenue chain

Question 128

What is Ranging?

⇒ The process of fixing intermediate points during chaining to maintain the direction of the work is known as range.

Question 129

What is compass surveying?

⇒ Compass surveying is the part of surveying in which a compass defines the direction of the survey line, and its length by tape or chain is known as compass surveying.

Question 130

What are the different types of compasses?

⇒ The different types of compasses as follows:

Prismatic Compass

Surveyor's compass

Question 131

What is traverse?

⇒ A series of connected lines whose length and direction are known is called a Traverse.

Question 132

What are the different types of traverse

There are 2 types of traverse as follows:

a. Open Traverse

b. Closed Traverse

Question 133

What is Meridian?

⇒ The fixed reference line is known as the meridian.

Question 134

What are the types of meridians?

⇒ The types of meridians are as follows:

a. True Meridian

b. Magnetic Meridian

c. Arbitrary Meridian

Question 135

What do you understand by bearing a line?

⇒ It is a horizontal angle that it makes with a reference line or meridian.

Question 136

What are the different systems of designation of bearing?

⇒ a. WCB (Whole circle bearing)

b. QB (Quadrantal or Reduced Bearing)

Question 137

In which system does the prismatic compass works?

⇒ WCB (Whole circle bearing) system

Question 138

In which system does the surveyor compass work?

⇒ QB (Quadrantal or Reduced Bearing) system

Question 139

What is a reduced level

⇒ It is the height of the point relative to the datum.

Question 140

What is a benchmark?

⇒ Fixed point of known elevation.

Question 141

What is Leveling?

⇒ It is the method of surveying to determine the relative position of the points on the earth's surface.

Question 142

What is the name of various parts of the dumpy level?

⇒ The name of various parts of the dumpy level are as follows:

a. Telescope
b. Eye-piece
c. Object piece
d. Eyepiece focusing screw
e. Objective focusing screw
f. Longitudinal bubble
g. Foot screw