**Environmental Engineering LAB VIVA Questions :-**

1. List out Experiments on Water?
2. What is Reagents?
3. Explain Acidity Test?
4. Types of Acidity?
5. Explain Alkaline Test?
6. List out materials contributed towards Alkalinity?
7. How to do know about Acidity or Alkalinity of water?
8. Explain Chloride Test?
9. Effects of Chloride presence in Water?
10. Explain Total Hardness Test?
11. Hardness of water caused due the presence of which material?
12. Explain pH Test?
13. Explain Electrical Conductivity Test?
14. Explain Turbidity Test?
15. How to measure Turbidity of water?
16. What is Coagulant? Explain with Example?
17. What is the use of Chlorine?
18. How to determine Total Solids in water?
19. How to determine Total Dissolved Solids?
20. How to determine Total Fixed and Volatile Solids?
21. Explain DO Test?
22. Explain BOD Test?
23. What is the use of Flame Photometer?
24. What is need to UV Test?
25. What is Residual Chlorine?
26. Effects of Fluoride presence in Water?
27. The acceptable value of pH of potable water?
28. Water with hardness upto 50 ppm is known as?
29. Bleaching Powder is mixed in water for?
30. Potable water means?

## **Building Construction and Materials LAB VIVA Questions :-**

1.Types of Foundation
2.Brick Masonary v/s Stone Masonary
3.Types of bonds used in Brick Masonary
4.Classification of Stone Masonary
5.General Principles of Supervision of Masonary Work
6.Plastering v/s Pointing
7.Scaffolding
8.Lintel v/s Arches
9.Staircase
10.Quality of Bricks
11.Characteristics of Good Stone
12.Characteristics of Good Timber
13.Cement, Types of Cement
14.Ingredients of Cement
15.Types of Bricks
16.Distemper v/s Snowcem
17.PVC v/s Stoneware
18.Seasoning of Timber
19.Tests on Bricks
20.Construction Joints

SURVEYING LAB VIVA Questions with Answers :-

1. What is the fundamental difference between surveying and leveling?

In surveying the measurements are taken in horizontal plane, but in leveling they are taken in the vertical plane.

2. What is the fundamental difference between plane surveying and geodetic surveying?

In Plane surveying, the curvature of the earth is not considered. But in Geodetic surveying, the curvature of the earth is considered.

3. What do you mean by terms “topographical map” and cadastral map?

A map which shows the natural features of a country such as rivers, hills, roads, railways, villages, towns, etc. is known as topographical map, and one which shows the boundaries of estates, fields, houses, etc. is known as a cadastral map.

4. What is the main principle of surveying?

The fundamental principle of surveying is to work from the whole to the part.

5. How is a chain folded and unfolded?

In order to fold the chain, a chainman moves forward by pulling the chain at the middle so that two halves come side by side. Then he places the pair of links on his left hand with his right hand until the two brass handles appear at the top.

To unfold the chain: A chain man holds the two brass handles in his left hand and throws the bunch with his right hand. Then one chain man stands at a station holding one handle and another chainman moves forward by holding the other handle.

6. In a chaining operation, who is the leader and who is the follower?

The chain man at the forward end of the chain who drags the chain is known as the leader and the one at the rear end of the chain is known as the follower.

7. While chaining a line, if you have to measure through a steep sloping ground, what method should you apply?

The stepping method.

8. Two stations are not intervisible due to intervening high ground. How will you range the line?

The ranging is to be done by the reciprocal method.

9. What do you mean by normal tension?

The tension at which the measured distance is equal to the correct distance (i.e; when sag correction is neutralized by pull correction) is known as normal tension.

10. What do you mean by RF?

The ratio of the distance on the drawing to the corresponding actual length of the object is known as RF.

11. What is the difference between plain scale and diagonal scale?

The plain scale represents two successive units. The diagonal scale represents three successive units.

12. What is hypotenuse allowance?

When one chain length is measured on slopping ground then it shows a shorter distance on the horizontal distance is known as the hypotenusal allowance.

13. How many ranging rods are required to range a line?

At least three ranging rods required for direct ranging and at least four for indirect ranging.

14. What is the length of one link in a 20m chain?

The 20m chain is divided in to 100 links. So, one link is 0.2m. i.e; 20cm. long.

15. What is the Principle of chain surveying?

The Principle of chain surveying is triangulation.

16. What do you mean by triangulation?

The method of dividing an area into a number of triangles is known as triangulation.

17. Why is the triangle preferred to the quadrilateral?

The triangle is preferred just it is a simple figure which can be drawn by just knowing the lengths of its sides.

18. What is the disadvantage of using ill – conditioned triangles?

The apex point of an ill conditioned triangle is not well defined and sharp. This may cause some confusion while marking the actual point correctly on the map.

19. What is reconnaissance survey?

The preliminary inspection of the area to be surveyed is known as reconnaissance survey.

20. What is an index sketch?

During reconnaissance survey a neat hand sketch is prepared showing the frame work of the survey. This sketch is known as index sketch.

21. What is base line of survey?

Base line is the back bone of the survey. The frame work of the survey is prepared on this line.

22. How is the north line of the chain survey map fixed?

The north line of the chain survey map is fixed by taking the magnetic bearings of the base line by prismatic compass.

23. Suppose you are asked to conduct a chain survey in a crowded town what would you say?

In chain survey, whole area is to be divided into a number of triangles. But the formation of triangles is not possible in a crowded area. So I would reject the proposal.

24. What should be the maximum length of the offset?

The maximum length of the offset should be within the length of the tape used. Generally it should not be more than 15m.

25. How is a station marked on the ground?

The station is marked on the ground by a wooden peg and with a cross on the station point.

26. What is the need of a reference sketch?

If the station peg is removed by someone the station can be located accurately with the help of measurements shown in reference sketch.

27. How will you set up a perpendicular with the help of only a chain and tape?

By forming triangle in the ratio 3:4:5 using the chain and tape.

28. Who are the leader and follower when a line is being chained?

The chain man at the forward end of the chain who drags the chain is known as the leader. The one at the rear end of the chain is known as the follower.

29. Why does the field book open lengthwise?

If the field book is opened lengthwise, it becomes easy to maintain the continuation of a chain line.

30. Why is the scale always drawn in the map?

The paper on which the map is drawn may shrink or expand due to various reasons. If the scale is plotted on the map, then it is also reduced or enlarged proportionately. So the distance on the map measured by this scale remains unaltered.

31. What is it necessary to provide tallies in a chain?

Tallies are provided in a chain for the facility to counting some fractional length of the chain, when the full chain length is not required.

32. What do you mean by the term ideal triangle?

An equilateral triangle is said to be ideal.

**Basics:**

1. What is Surveying?

2. What is Leveling?

3. Objective and Uses of Surveying?

4. Methods of Surveying?

a. Triangulation

b. Traversing

5. Explain:

a. Topographic Map

b. Cadastral Map

c. Engineering Map

d. Military Map

e. Contour Map

f. Geological Map

g. Archeological Map

6. General Principle of Surveying?

**Chain Surveying:**

7. What is Chaining?

8. Instruments used in Chain Surveying?

9. How many links are in 30m Metric Chain? Length of each link?

10. Reciprocal Ranging?

11. What are Corrections?

12. How many ranging rods required for

a. Direct Ranging

b. Indirect or Reciprocal Ranging

13. Principle of Chain Surveying?

14. What is well-conditioned triangle?

15. What is Reconnaissance Survey?

16. What is Index Sketch?

17. How to set Perpendicular Offsets? (900)

18. What is Field Book?

**Compass Surveying**:

19. Principle of Compass Surveying?

20. Explain:

a. True Meridian

b. Magnetic Meridian

c. Arbitrary Meridian

d. Magnetic Bearing

i. Whole Circle Bearing (WCB)

ii. Quadrantal Bearing (QB)

iii. Reduced Bearing (RB)

e. Fore Bearing

f. Back Bearing

g. Magnetic Declination

h. Dip of the magnetic needle

i. Local Attraction

20. What is traversing?

a. Close Traverse?

b. Open Traverse?

21. Check on Closed Traverse

a. Sum of exterior angles?

b. Sum of interior angles?

22. Check on Open Traverse

23. How to adjust Closing Error?

**Plane Table Surveying:**

25. Principle of Plane Table Surveying?

26. Instruments used?

27. What is Orientation?

a. Orientation by Magnetic Needle?

b. Orientation by Backsighting?

28. Methods of Plane Tabling? What is the need of

a. Radiation?

b. Intersection?

c. Traversing?

d. Resection?

**Leveling:**

29. Uses of Leveling

30. Datum Surface or Line

31. Reduced Level?

32. Line of Collimation?

33. Bench-marks (BM)

a. GTS Bench-marks

b. Permanent Bench-marks

c. Arbitrary Bench-marks

d. Temporary Bench-marks

34. Backsight Reading (BS)

35. Foresight Reading (FS)

36. Intermediate sight Reading (IS)

37. Change Point?

38. Instruments used in Leveling?

39. Types of Leveling?

a. Simple Leveling

b. Differential Leveling

c. Fly Leveling?

d. Profile Leveling?

e. Check Leveling?

40. Need of Reciprocal Leveling?

41. Methods of Calculation of Reduced Level

a. Height of Instrumentation method

b. Rise-and-Fall method

42. Arithmetical Check?

**Contouring:**

43. What is Contour Map?

44. Contour Line?

45. Contour Interval?

46. Horizontal Equivalent?

47. Object of preparing Contour Map

48. Uses of Contour Map

**Computation of Area:**

49. Trapezoidal Rule?

50. Simpson’s Rule? Limitation?

Soil Mechanics & Foundation Engineering LAB VIVA Questions :-

1. Properties of Soil

2. Tests on Soil at Laboratory

3. Atterberg Limits

4. Earth Pressure Theories

5. Active Earth Pressure v/s Passive Earth Pressure

6. Mohr’s Circle

7. Shear Strength of Soil

8. Friction Angle

9. Coulomb’s Law

10. Tests to get Shear Strength

11. Soil Exploration

12. Types of Foundations

13. Factors affecting Slope Stability

14. Bearing Capacity of Soil

15. Terzaghi’s Analysis

SOIL MECHANICS LAB VIVA Questions:-

1. What Is Meant By Elastic Limit?

The maximum extent to which a solid may be stretched without permanent alteration of size or shape

2. State The Applications Of Modulus Of Elasticity?

Modulus of elasticity is related to the flexibility of the material. The value of modulus of elasticity is pretty important in case of deflection of different materials used in building construction.

3. What Is Meant By Poisson Ratio?

Poisson’s ratio, named after Siméon Poisson, is the negative ratio of transverse to axial strain. When a material is compressed in one direction, it usually tends to expand in the other two directions perpendicular or parallel to the direction of flow.

4. What Is Punching Shear?

Punching shear is a type of failure of reinforced concrete slabs subjected to high localized forces. In flat slab structures this occurs at column support points.

5. The Standard Sand Now A Day’s Used In India Is Obtained From?

Ennore (madras)

6. What Is Soil Analysis?

Soil analysis is the testing of soil to determine the nutritional and elemental composition of soil. It is generally tested for knowing the contents of nitrogen, potassium and phosphorus.

7. What Is The Difference Between Sill Beam, Tie Beam And Plinth Beam?

Sill beam: – flexural member

Tie beam: – fully compression member

Plinth beam: – loading from bottom (soil mass) is UDL so

Main reinforcement is in top of beam.

8. The Foundation In Which A Cantilever Beam Is Provided To Join Two Footings, Is Known As?

Strap footing

9. The Foundations Are Placed Below Ground Level, To Increase?

Strength

Work ability

Stability of structure

10. What Are The Causes Of Failure Or The Error Made In The Design Of The Failed Wall Is?

The main reason of failure of a wall is overturning.

11. What Is The Difference Between Grade Beam And Plinth Beam?

Plinth beam is a part of a structure can transfer loads to the adjacent columns, grade beam is a type of foundation system used to distribute the weight of a building over unstable soil. The grade beam may sit directly on the loose soil.

PERMEABILITY TEST:

1) List ‘k’ values for different types of soils.

2) How permeability test is done in the field?

3) Mention other permeability tests that can be done in the lab.

4) What is the application of permeability of soils?

5) Derive the expression for ‘k’ by falling head method.

6) Is hydraulic gradient constant in variable head test? Why?

7) How will you reduce observed permeability to permeability at standard temperature?

8) What is the necessity of two methods for determination of ‘k’ in lab?

9) Estimate discharge velocity in constant head test conducted. What is seepage velocity?

10) Time interval for flow from h1 to h0 should be same as that from h0 to h2. Why?

FIELD DENSITY –SAND REPLACEMENT METHOD (IS 2720 PART XXVIII-1974)

11) Depth of hole made in field is limited to 15 cm. Why?

12) Explain core cutter method for determination of in-situ density of soil.

13) Explain the significance of in-situ density soil density determination.

COMPACTION TEST (IS 2720 PART VII-1974)

14) What is the approximate value of degree of saturation at OMC?

15) How does amount of compaction affect maximum dry density and OMC?

16) What is the procedure for conducting modified proctor test?

17) What is the use of proctor’s needle? How is it used for compaction control in the field?

18) Explain how soil compaction is achieved?

CALIFORNIA BEARING RATIO TEST

19) How correction for initial concavity is done in load-penetration curve?

20) What is the application of CBR test results?

21) Write the procedure to find expansion ratios for a soaked test.

22) What is the need for adding surcharge weights?

CONSISTENCY LIMITS (IS 2720 PART V-1972, IS 9259-1979)

23) Draw plasticity chart and mark the soil tested and classify soil.

24) What is activity number?

25) Why clay exhibit plasticity while silt does not?

26) Indicate engineering uses of IP , IT , IL and IC

27) Is soil fully saturated at shrinkage limit?

28) Explain the one point method for liquid limit determination.

29) If the plastic limit is greater than or equal to liquid limit, how will you report IP of the soil?

30) If plastic limit can’t be determined for sandy soil, how will you report plasticity index?

31) Whether oven drying of sample before test is permitted? If not why?

32) Find compression index of given normally sensitive clay. What is the use of it?

33) How will you differentiate organic and inorganic soil using liquid limit test?

ENGINEERING GEOLOGY Lab Viva Questions:-

1. The shape of the Earth is:

Geoid

2. Age of the Earth is

4.6 billion years

3. Sial and Sima are separated by

Conrad discontinuity

4. Morhorovicic discontinuity is found between

Crust and Mantle

5. Mantle and Core are separated by

Gutenberg discontinuity

6. The term ‘NiFe’ refers to

Core of the Earth

7. The plastic layer of the mantle is called

Asthenosphere

8. The composition of Sial is

Granitic to grano dioritic

9. The composition of Sima is

Basaltic

10. The polar and equatorial diameter of the Earth is

12,713 km and 12,756 km

Geomorphology :

11. The process of disintegration and decomposition is called

Weathering

12. The process of Erosion includes

Disintegration

13. Frost action takes place due to

Freezing of water

14. Which minerals are highly susceptible to chemical weathering?

Ferromagnesian Minerals

15. Which are characteristic functions of the geomorphic agents?

Erosion, Transportation and Depositional works

16. William Morris Devis has recognised the stages involves in a cycle of river erosion are

Initial stage, Youth stage, Mature stage and Old stage

17. In which stage of erosional cycle maximum changes occur

Mature stage

18. Waterfalls and Gorges are characteristic features of the river in

Initial stage

19. Pot holes are formed generally by

Abrassion or Corrosion

20. Chemical erosion by river water is known as

Corrosion

21. The transportation by Creeping and Rolling is known as

Traction

22. The plain land produced by the river action is

Pene plain

23. Deltas are formed in

Old Stage of the River

24. The transportation through lifts and falls of materials is known as

Saltation

25. Which type of drainage pattern develops in folded or tilted beds?

Trellis pattern

26. Canyon is

A deep valley with steep near vertical sides

27. Pass is

An opening between the Mountains

28. Aeolian topography is created by the geological action of

Wind

29. Yardang topography associated with

Wind action

30. Which instrument is used to measure the wind velocity?

Anemometer

31. Loess is

Homogeneous and un-stratified deposit of silt

32. A Crescent shaped dune with two tapering arms is known as

Barchan

33. Wind ripples are generally formed by

Saltation movement of sand grains

34. A normal sand-dune is characterized by

Gentle windward and steeper leeward sides

35. Blow-outs are

Broad shallow depression in desserts

36. When one wing of a Barchan is missing, then it is known as

Seif

37. The space between the dunes is known as

Gassis

38. Chinook is a local hot wind which flows mostly in

USA and Canada

39. Which abrasion is more effective in rounding the sand grains

Wind abrasion

Wind abrasion

40. “Lag-Gravel” is

The coarse sediments left behind where wind has removes the finer grain sizes

41. Glaciers are formed by

Compaction and Re-crystallisation of snow

42. Ne’ve’ or Flrn are

Granular ice mass

43. The polar glaciers are

Below the freezing point throughout the year

44. The Karst topography developed due to the action of

Groundwater

45. Which process is mainly responsible for development of the Karst topography?

Chemical Process

46. The columns of limestone that hang from the ceiling downwards are known as

Stalactites

47. Stalagmites are

Rising up vertically from the floor of the cavern

48. Blind valleys are found in

Karst topography

49. Drip-stones are

Columns formed by joining of Stalactite and Stalagmite

50. ‘Terra rossa’ is

Residual red soil occurring on limestone in Karst region

51. The difference between lake and basin is

Lakes commonly occur above the mean-sea level while basins have their bottoms below the water table.

52. Dhands are

Small lakes of Aeolian origin

53. A narrow strip of water joining the two water bodies is called

Strait

54. The ocean which is between Africa and Australia

Indian Ocean

Crystallography & Mineralogy :

55. The faces, edges and solid angles have a definite relationship with each other. This relationship is expressed by

Euler’s formula

56. Euler’s formula is

F+A = E+2

57. Centre of symmetry is

Repetition is with respect to a point

58. Axis of Symmetry

Repetition is with respect to a line

59. Plane of Symmetry

Repetition is with respect to a plane

60. Which instrument is used to measure the interfacial-angle of crystals

Goniometer

61. Which crystal system is having maximum of classes

Hexagonal system

62. In which crystal system majority of minerals crystallizes.

Monoclinic system

63. The Isometric system is characterised by

4 axes of 3 fold symmetry

64. What is the normal interfacial angle in dodecahedron form of cubic system?

600

65. Gyroidal class belongs to

Isometric system

66. The cleavages in twinned crystals are

In different directions

67. Butterfly twinning is seen in

Gypsum

68. Pericline twin is found in

Plagioclase

69. The degree of transparency of a mineral is known as

Diaphaneity

70. Give an example of a mineral in which cleavage is absent

Quartz, Corundum

71. Hardness of human nail varies between

1.5 to 2.5

72. Hardness is which kind of property

Anisotropic (A mineral may show different values in different directions.)

73. The tendency of a crystallized mineral to break along certain directions yielding more or less smooth, plane surface is

Cleavage

74. The behaviour of a mineral towards the forces that tend to destroy it is called

Tenacity

75. A Mineral is

Naturally occurring inorganic substance with definite chemical composition

76. The external appearance of a Mineral is known as

Habit/ Form

77. The powered form of a mineral is

Streak

78. Shining property of a Mineral is

Lustre

79. Form in which neither a crystal face nor a cleavage is seen in

Amorphous

80. Quartz shows which lustre

Vitreous

81. Which mineral shows silky lustre

Asbestos, Gypsum

82. Mica is

Flexible and elastic

83. Kyanite shows which form

Bladed

84. Structure or form which depicts leaf like sheets is

Lamellar

85. Muscovite mica shows which structure

Foliated

86. Which form resembles human kidney

Reniform?

87. chromite shows which type of structure

Granular

88. Colour changing phenomenon which involves oxidation is

Tarnish (A phenomenon of change of original colours of minerals to some secondary colours at its surface due to oxidation at the surface)

89. Diamond shows which type of lustre

Adamantine

90. Streak is an important diagnostic property of

Coloured minerals

91. Generally which minerals give streak

Coloured and opaque

92. Hardness of a mineral depends upon

Chemical composition and atomic constitution

93. The scale of hardness is

Mohs (It was in 1822 that Austrian mineralogist F. Mohs proposed a relative, broadly quantitative “scale of hardness” of minerals assigning values between 1 to 10)

94. Which mineral group is abundantly found in the Earth’s crust

Feldspar group (Second abundant is Silicate or Quartz group)

95. Feldspar is found majority in which kind of rock

Igneous rocks

96. Acicular habit shown in

Natrolite

97. Violet colour of Amethyst is due to

MnO2

98. The mineral which can be cut and powdered are known as

Sectile

99. Opaque minerals indicate their origin from a

Rapidly cooled silicate melt

100. Orpiment and Realgar are Sulphides of

Arsenic

Optical Mineralogy :

101. In natural light, the elctro-magnetic vibrations are:

Always perpendicular to the direction of light-wave prorogation

102. Refractive index depends upon

Nature of the substance and Kind of light used

103. The refractive index of Canada balsam is

1.54

104. Plane polarised light can be produced by

Nicol prism, Reflections, Absorption

105. Backe-line method is used to determine the

Refractive index

106. Which property determines the colour

Wavelength

107. The wavelength varies from slightly more than …. at the red end to about …. at the violet end

7000 Å and 4000 Å respectively.

108. The isotropic substance has

A single refractive index

109. Double refraction phenomenon shown by

Anisotropic substance

110. The angle between the reflected and refracted ray is 900, stated by

Brewster’s law

111. Which crystal systems are optically uniaxial

Hexagonal and Tetragonal

112. Which crystal systems have two optic axis

Orthorhombic, Monoclinic and Triclinic

113. Uniaxial crystal are positive if

Ordinary ray has the greater velocity than the Extraordinary ray

114. The difference between the maximum and minimum indices of a particular mineral is known as

Birefringence

115. What is the birefringence of Quartz mineral

0.009

116. Birefringence is used to determine

Thickness of section

117. Bereck compensator is an optical device which is made up of

Calcite

118. The order of interference colour is determined by

Quartz plate

119. A Polaroid is a

Light filter

120. Biaxial minerals show

Symmetrical extinction

121. Complete extinction occurs only when the section is

Perpendicular to optic symmetry

122. Which is also known as Glimmer plate

Gypsum plate

123. Amorphous substance are

Anisotropic

124. Orthoclase is distinguished from Quartz in thin section by

Low refractive index, Type of twinning and Negative sign

125. The Michael-Levy method is used to determine the extinction angle of

Plagioclase

126. Which plate is generally used to determine the optical sign of plagioclase

Selenite plate

127. The Orthopyroxenes show interference colour of

1st order

128. Which type of extinction is often shown by Quartz mineral

Wavy

129. Calcite is characterised by

Rhombohedral cleavage, low interference colour and optically negative character

130. Calcite and Magnesite can be distinguished from one another in thin section

Magnesite is never twinned

**Concrete Technology LAB VIVA Questions:-**

1. List out various tests on Cement?

2. List out various tests on Fine Aggregate?

3. List out various tests on Coarse Aggregate?

4. List out various tests on Bitumen?

5. What do you know about NDT?

6. List out various equipment used in NDT?

7. Vicat Apparatus is used for?

8. Initial Setting Time of Cement?

9. Final Setting Time of Cement?

10. List out Grades of Cement available in Market?

11. Apparatus used for Soundness of Cement?

12. Equipment used for Abrasion Test?

13. Equipment used for Attrition Test?

14. Workability Means?

15. List out Workability Tests?

16. Slump value required for RCC Slab?

17. What is Segregation of concrete?

18. List out various sizes of Coarse Aggregate used in Concrete?

19. Equipment used to test Compressive Strength of Concrete?

20. Size of Concrete Cubes?

21. What is the standard w/c value for nominal mix of concrete?

22. Density of Concrete?

23. No. of Cube samples required for testing Compressive Strength for 100 m3 of concrete?

24. List out Shape Tests on Coarse Aggregate?

25. Aggregate Impact value of material A is 15 and that of B is 35. Which one is better for surface course?

26. The abrasion value found from Los Angeles test for two aggregates A and B are 50% and 38% respectively. Which aggregate is harder?

27. Two materials have abrasion values 3 and 10 respectively. Which one is harder and why?

28. Define flash and fire points of Bitumen?

29. Define specific gravity?

30. What do you understand by the term 80/100 bitumen?

31. What is softening point?

32. If material A has softening point of 56 and B has 42 which binder is good and why?

33. List the factors that affect the result of a ductility test?

34. Explain the significance of ductility test?

35. Explain the term viscosity?

36. Explain aggregate crushing value. How would you express?

37. Aggregate crushing value of material A is 40 and that of B is 25. Which one is better and why?

38. How is aggregate impact value expressed?

39. Aggregate impact value material A is 20 and that of B is 45. Which one is better for surface course? Why?

40. Explain ductility of Bitumen and its significance?