

R23ES01 JNTUGV - R 23

1ST YEAR 1ST SEMESTER

Basic Civil & Mechanical Engineering (Common to all branches of engineering)

Unit 1 & 2 short and long answers

1. What is the role of civil engineers in the society?

- Main role of Civil engineers is in surveying, planning, designing, estimation and execution of structures.
- To solve different engineering problems with the help of field experience, laboratory techniques, numerical methods, mathematical models, using computer and information technology.
- To implement management techniques for better management of man, material, machine and money.
- To carry out soil investigation for design of foundations of structures.
- To invite tenders and to select contractor for the work.

2. What are the various disciplines of civil engineering?

- Structural Engineering
- Geotechnical Engineering
- Transportation Engineering
- Hydraulics and Water Resources Engineering
- Environmental Engineering

3. What are the different types of cement?

- 1) Ordinary Portland Cement
- 2) Portland Pozzolana Cement
- 3) Rapid Hardening cement
- 4) Extra Rapid Hardening Cement
- 5) Quick Setting Cement
- 6) Low Heat Cement
- 7) Sulphate Resisting Cement

4. What are the different tests used on cement?

- 1) Fineness Test
- 2) Consistency Test
- 3) Setting Time Test
- 4) Strength Test
- 5) Soundness Test
- 6) Heat of Hydration Test

- 7) Tensile Strength Test
- 8) Chemical Composition Test

5. What are the different types of bricks?

- a) Sun-dried bricks
- b) Concrete bricks
- c) Lime bricks
- d) Engineering bricks
- e) Fly ash bricks

6. What are the types of aggregates ?

- 1. Fine aggregates
 - a) Sand
 - b) crushed stone
 - c) ash or cinder
 - d) surkhi
- 2. Coarse aggregates
 - a) Rounded
 - b) Irregular
 - c) elongated (long)
 - d) flaky (flat)

7. What are the tests on aggregates ?

- a) Aggregate Abrasion Value (AAV)
- b) Aggregate Crushing Value (ACV)
- c) Ten Percent Fines value (TFV)
- d) Aggregate impact value (AIV)
- e) Magnesium sulphate soundness value.
- f) Particle size distribution.
- g) Water absorption.

8. What are the different factors to be considered in building planning?

- a) Purpose and functionality
- b) Site selection
- c) Building regulations
- d) Space requirements
- e) Safety and security
- f) Energy efficiency

9. What is the importance of surveying in civil engineering?

- a) Surveying lays the foundation for constructing projects of any scale, guiding the placement of lines and points during project execution.

- b) The determination of land size and boundaries hinges on surveying; without it, these critical aspects remain uncertain.
- c) Surveying is indispensable for assessing the engineering and economic feasibility of a project, providing essential insights
- d) Hydrographic and oceanographic charting and mapping rely on surveying techniques for their accurate execution.
- e) Surveying serves as the fundamental method for creating precise topographic maps of Earth's land surface.

10. What are the objectives of surveying?

- a) To generate a comprehensive plan or map that accurately depicts the relative positions of objects upon the Earth's surface.
- b) To collect essential data for the earthwork.
- c) To measure the area and volume of the site.
- d) To construct any structure on the ground according to its drawing.
- e) To determine field parameters and properties, for planning and execution of various projects.
- f) To estimate the quantity of the products to be used and their cost.
- g) To solve measurement problems optimally

11. What are the types of leveling?

1. Direct leveling
 - a) Simple leveling
 - b) Differential leveling
 - c) Fly leveling
2. Precise leveling
3. Profile leveling
4. Reciprocal leveling
5. Check leveling
6. Stadia leveling

12. What are the uses of total station?

- a) Modern Surveying: A total station is an electronic/optical instrument used in modern surveying.
- b) Excavations: Total Station is also used by archaeologists to record excavations.
- c) Measurements of Scenes: Total Station is used by police, crime scene investigators, private accident Reconstructionists and insurance companies to take measurements of scenes.
- d) Angle and Distance Measurement: A total station can measure angles and distances electronically and process trigonometrically to give us, at a minimum, position coordinates in space.
- e) Data Processing: The total stations can also be used to show the map on the touch-screen of the instrument immediately after measuring the points. This process is called "data processing".
- f) Mining: A total station is used to record the absolute location of the tunnel walls, ceilings (backs), and floors as the drifts of an underground mine are driven.

The recorded data are then downloaded into a CAD program, and compared to the designed layout of the tunnel.

- g)** Meteorology: Meteorology also use total stations to track weather balloons for determining upper-level winds. It is also used to track ceiling balloons to determine the height of cloud layers.

13. What are the characteristics of contours?

- a)** Must close on themselves, on or off the map
- b)** Perpendicular to the direction of max. slope
- c)** Slope between them is assumed uniform
- d)** The distance between them indicates the steepness of the slope, gentle or steep
- e)** Irregular signify rough, smooth signify gradual slopes
- f)** Concentric closed contours: hills or depression
- g)** They do not cross each other, only in special cases
- h)** They do not branch into contours of the same elevation
- i)** They do not cross building
- j)** They cross horizontal man made surfaces in parallel lines

14. What are the errors in surveying?

These are the following different sources of errors:

- Natural errors
- Instrumental errors
- Personal errors

15. What are the terms used in leveling?

- a) Level line
- b) Horizontal line
- c) Vertical angle
- d) Datum surface
- e) Bench mark
- f) Line of collimation
- g) Back sight
- h) Fore sight
- i) Height of instrument
- j) Station
- k) Change of point

Long answer questions:

1. Explain different tests to be conducted on cement?
2. Explain the factors to be considered in building planning?
3. Explain the layout of residential building in detail?
4. Explain the principles of electronic theodolite
5. Describe the method of reciprocal leveling?

