BCE Assignment-2

Name : Shreerang Mhatre
Rollno : 111056
Div : 11
Batch : K3

Q1) Differentiate between Shallow Foundation & Deep Foundation

Ans:

Sources	Shallow Foundation	Deep Foundation
① Defination	Foundation which is placed near the surface of earth or transfer the loads at shallow depth is called the shallow fond.	Foundation which is placed at a greater depth or transfer the loads to deep stata is called deep foundation.
② Cost	A shallow depth foundation is cheaper	Deep foundations are more expensive.
③ Mechanism of load transfer	Shallow foundations transfers loads mostly by end bearings	Deep foundations rely both on bearing & skin friction with few expeption like end-bearings pile.
④ Advantages	Construction materials are available, less labor is needed, construction procedure is simple at affordable cost.	Foundation can be provided at a greater depth, provides lateral support & resists uplift, effective when foundation at shallow depth is not possible.

Q2) Describe in short 'smart materials used in Engineering'.

Ans: Smart materials are materials that are manipulated to respond in a controllable & reasonable way, modifying some of their properties as a result of external stimuli such as certain mechanical stress or a certain temperature among others.

The main advantage of smart Materials is that they give a material new capabilities without the need of sensors actuators or electronics

- Types of smart materials are:-

① Piezoelectrics, shape memory alloys
② Magnetostrictive, shape memory polymers
③ Hydrogels, electroactive polymers
④ Bi-component fibers.

Q3) Determine the carpet area per floor of a two storey building from the following data.

a) Plot area = $600m^2$
b) FSI allowed = 1.0
c) Ratio of carpet area/built-up area = 0.7

Ans: Plot area = $600m^2$, FSI = 1.0

$$\therefore FSI = \frac{\text{Built up area}}{\text{Plot area}}$$

$$= \frac{\text{Built up area}}{600}$$

Built up area = $600m^2$

Built up area for each storey = 600/2 = 300 M^2

$$\frac{\text{Carpet area}}{\text{Built up area}} = 0.7$$

$$\frac{\text{Carpet area}}{200} = 0.7$$

$\therefore$ Carpet area = 210 M^2

$\therefore$ The carpet area per floor is 210 M^2

(Q4) Briefly discuss the role of an Engineer to achieve sustainable development.

Ans: The role of engineers in achieving Sustainable dev are-

a) As companies build a more positive and sustainable work culture, engineers play an important role in sustainable developments building projects that preserve natural resources are cost efficient and support human & natural environments.

b) To boast the nation's Sustainable development goals (SDG's) engineers remain key contributions in the vast chain of modern production & consumption of natural resources to deliver goods, products, and solutions for the larger society.

c) They must focus on incorporating sustainibility by design across business and operations and significantly research and development to enable sustainibility in product solutions.

Q5) It is proposed to plan a bunglow. As civil engineering students discuss the planning principles to be followed for the planning of the bunglow.

Ans: There are 9 Principles of building planning.

1. Aspect: It refers to the planned arrangement of the doors and windows of the external walls to get sunlight, breeze and a good view scenery.
2. Prospect: It presents a good and pleasing apperance when seen from outside.
3. Furniture requirement: It is the functional requirement of a room decides the required furniture.
4. Roominess: It is obtained by getting the minimum dimensions of a room from maximum benifit of a room without cramping the plane.
5. Grouping: It means setting different rooms of a building according to their inter-relationship of variation and transition.
6. Circulation: The way people move through and interact with a building.
7. Sanitation: It is the process of disposing of human excreta in a manner that protects public and environmental health.
8. Eligance: The planning of elevation and layout of the plan to give an impressive appearance to the building.
9. Privacy: Every rooms should have certain privacy which can be secured.

(10) Flexibility: The ability of a building to continously adapt its space layout and even its structure to evolving needs.

(11) Design economy: The value created by those employed in design sector in a wide variety of industries.

(12) Practical considerations: The strength, stability, convinence and comfort of the occupants of the building.

Q6) Explain briefly following terms used in building bylaws:

a) Open space requirement -

→ As per national building code (NBC) norms, the minimum exterior, open spaces around buildings that are 55 meters or more should be 16M. on side where no habitable rooms face a minimum space of a meters shall be left for higher above 27 meters.

b) Setback Distance -

Setback distance can be explained as the minimum open space required around any building or structure. Municipal regulations provide that a specific distance should be maintained between a building and the boundary of the plot on which the building is being constructed. A minimum

distance of 10 feet shall be required between all main residential buildings established on the same lot or parcel of land.

c) Floor space index (FSI) -

FSI is the maximum permissible floor area that a builder can build on a particular plot/piece of land. FSI is the ratio of building floor covered area to area available on the land. FSI varies from place to place under the rules and regulations set by the city's administration.