

ACET.

BUILDING SERVICES (3360604)

Sem:- VI

FAQ

Unit - 1 → Introduction to building services.

Q:1 Define 'Building Services' and List various building services.

Ans:- Building services are the systems installed in buildings to make them comfortable, functional, efficient and safe.

- Energy supply - gas, electricity and renewable sources.
- Heating and air conditioning.
- water supply, drainage and plumbing.
- Natural and artificial lighting.
- Ventilation and refrigeration.
- Escalators and lifts.
- Communication lines, telephones and IT networks.
- Fire safety, detection and protection.
- security and alarm systems.
- Anti-termite treatments.
- Damp proofing treatments.
- water proofing treatments.

Q-2 Give classification of building as per NBC-2005.

Ans:-

- Group A - Residential Buildings
- Group B - Educational Buildings
- Group C - Institutional Buildings
- Group D - Assembly Buildings
- Group E - Business Buildings
- Group F - Mercantile Buildings
- Group G - Industrial Buildings
- Group H - Storage Buildings
- Group J - Hazardous Buildings.

Q-3 What is glare? Give its types.

Ans → Excessive contrast or abrupt and large changes in brightness produces the effect of glare. when glare is present the efficiency of vision is reduced and small details in scene can not be perceived.

→ There are three types of glare:

(a) direct glare :- due to light sources within the field of vision.

(b) reflected glare :- due to reflections from light sources or surfaces of excessive brightness.

(c) veiling glare :- where the peripheral field is comparatively very bright.

→ Glare can be minimized in this case either by shielding the open sky from direct light by louvers, deep reveals or curtains, or cross lighting the surroundings to a comparable level.

Q:-4] Define the terms:-

- (1) Luminous flux (2) Lumen (3) Luminous intensity
(4) Illuminance (5) Lux (6) candela (7) visual task

Ans:- (1) Luminous flux (ϕ):-

→ Total quantity of light emitted from a point source of light per second called luminous flux (ϕ)

→ It is denoted by ϕ .

→ It's unit is lumen.

→ 1 lumen = 0.0016 watt.

(2) Lumen:-

→ It is the SI unit of luminous flux.

→ Lumen = candela power \times solid angle.

→ The luminous flux emitted within unit solid angle (1 steradian) by a point source having a uniform intensity of one candela, is called lumen.

(3) Luminous intensity (I):-

→ Amount of luminous flux emitted from a source in any one direction per unit solid angle is called luminous intensity.

→ It is denoted by I

→ It is expressed in candela or Candela power

$$I = \frac{\phi}{\omega}$$

where ϕ = luminous flux

ω = solid angle (in steradian)

(4) Illuminance (E) :-

→ If from a source of light ϕ lumen flux fall on area A , the illuminance is

$$E = \frac{\phi}{A}$$

→ If ϕ is in lumen and area in m^2 , then E is expressed in lumen $/m^2$,
 $1 \text{ lumen}/m^2 = 1 \text{ lux}$.

→ The application of visible radiation to an object is called illumination.

(5) Lux :-

→ If a light source of 1 candela power luminous intensity is placed at the centre of sphere of 1m radius, the illuminance obtained on the interior surface of the sphere is 1 lux.

$$1 \text{ lux} = 1 \text{ m} \cdot \text{candela} = 1 \text{ lumen}/m^2$$

It is the S.I unit of illuminance.

(6) candela (Cd) :-

→ candela is the SI unit of luminous intensity.

$$1 \text{ candela} = 1 \text{ lumen per steradian}$$

candela is also called candle power.

$$\text{Candle power} = \frac{\text{lumen}}{\text{solid angle}} = \frac{\text{lm}}{\text{sr}}$$

(7) visual task :-

→ The ease and certainty with which an eye can see an object is called visual task.

Q-5 Give equation for the calculation of luminous flux.

Ans → Calculation for determining the luminous flux:

$$E_{av} = \frac{\mu \phi}{A}$$

or

$$\phi = \frac{E_{av} \cdot A}{\mu} \dots \dots \text{for new condition}$$

$$\text{and } \phi = \frac{E_{av} \cdot A}{\mu \cdot d} \dots \dots \text{for working condition}$$

where,

ϕ = Total luminous flux of the light sources installed in the room in lumens.

E_{av} = Average illumination level required on the working plane in lux.

A = Area of the working plane in m^2 .

μ = the utilization factor in new conditions

d = maintenance factor.