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**BAR-039**

00140

# BACHELOR OF ARCHITECTURE (BARCH)

## Term-End Examination

## June, 2013

## BAR-039 : ARCHITECTURAL SCIENCES AND SERVICES - II (ILLUMINATION AND ACOUSTICS)

*Time : 3 hours* *Maximum Marks : 70*

***Note :*** *Question 1 is compulsory. Answer 5 questions in all. Answer any 2 questions from section B and 2 questions from section C. Use of calculators is permitted.*

### SECTION-A

**1.** Write on **any four** from the following : - **4x3½=14**

(a) hue

(b) chroma

(c) threshold of audibility

(d) Seasonal Affective Disorder (SAD)

(e) sabine's formula

(f) masking of sound

## SECTION - B

(Answer **any two** questions)

2. What are the paths through which noise enters a building ? As an architect, how do you provide sufficient acoustic isolation to prevent externally and internally generated noise from interfering with the designated use of space ? Explain in the context of a modern day residential building with the aid of sketches. **14**

3. (a) A seminar hall has a volume of $2000m^3$ and the total absorption of all acoustic materials without the audience is 80 $m^2$ sabines 7

   Find (1) reverberation time of empty hall in seconds.

   (b) A school auditorium has a capacity of 800 persons. Considering 3.5 cum of volume per person and reverberation time of 1.25s, What would be the total sound absorption area required ? 7

4. (a) What are the important sound absorbers used in acoustic design ? 7

   (b) What is the effect of audience on reverberation time while designing an auditorium ? What are the design considerations to be taken while designing the acoustics of an auditorium ? 7

## SECTION - C

(Answer **any two** questions)

5. (a) A room measuring 10m x 10m has to be illuminated to a level of 200lux by a single electric lamp. The coefficient of utilisation is 0.75 and the maintenance factor is 0.80. Find 7

   (i) The lumen output required for the above lamp.

   (ii) The depreciation factor for the above lamp

   (b) Describe the lumen method for general lighting. 7

6. (a) List the various aspects that a lighting designer would ensure for a light which is adequate and suitable for a visual task ? 6

   (b) In a display window of Height H = 8.66m, of a retail store, luminaire of intensity L is mounted at a distance L = 5m away from the rear. Its light beam is cast at an angle of 45° from the ceiling as shown in the figure 1. 8

   Find the ratio of illumination at $P_1$ and $P_2$

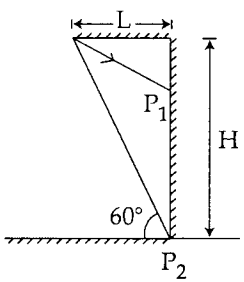


Fig. (1)

7. Define the following : **4x3.5=14**

(a) Illumination

(b) Luminance

(c) Visual performance

(d) Visual acuity