

09ARC 6.3 –BUILDING SERVICES – IV (ACOUSTICS)

Written by Administrator

Saturday, 31 October 2009 17:51 -

CONTACT PERIODS : : 3 (LECTURE) PER WEEK

DURATION OF EXAM : 3 HRS

EXAM MARKS□□□□□□ : 100

PROGRESSIVE MARKS□□ :□□□ 50

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Objective:

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To develop the knowledge and skills required for understanding acoustics in buildings and its integration with architectural design.

Outline:

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Part– A

Introduction to the study of acoustics – nature of sound, basic terminology – frequency, pitch, tone, sound pressure, sound intensity, decibel scale, loudness, threshold of audibility and pain, masking, sound and distance – inverse square law.

Behaviour of sound in enclosed spaces – reflection of sound, nature of reflection from plane, convex and concave surfaces, sound diffraction, Absorption of sound, sound absorption coefficient, reverberation, reverberation time calculation, use of Sabine's and Eyring's formulae, sound absorbents, porous materials, panel or membrane absorbers and cavity or Holmboltz resonators, role of functional absorbers.

Absorption coefficients of indigenous acoustical materials, use of IS code 2526-1963, method of setting out of raked seating.

Acoustical design requirement for halls used for speech, drama and music – general purpose halls used for both speech and music, cinema theatres, open air theatres. Study of auditoria designed and acoustically treated.

Part – B

Introduction to environmental noise control, noise and its classification, outdoor and indoor noise, airborne noise and structure borne noise, impact noise, community and industrial noise. Transmission of noise and transmission loss. Maximum acceptable noise levels. Means of

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noise control and sound insulations. Constructional measures of noise control and sound insulation. Use of sound measuring instrument.

Sources of industrial noise – impact, friction, reciprocation, air turbulence and other noise. Methods of reduction by enclosures and barriers, sources of outdoor noise – air traffic, rail traffic, road traffic and seashore and inland. Traffic planning and design against outdoor noise for air traffic, road traffic and rail traffic.

References:

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- 1) “Environmental Acoustics” by Leslie L Doelle
- 2) “Acoustical Designing in Architecture” by Knudson, Vern
- 3) “Acoustics: Noise and Buildings” by Parich, Peter
- 4) “Architectural Acoustics” by David Egan

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