6CE127 Transportation Engineering - II

L-T-P-Cr: 3-1-0-4

Objective: To introduce the elements related to railway engineering and airport engineering. The knowledge of rails, rail joints, geometric design railway tracks, points and crossings. The knowledge of airport elements, design of airport pavements and geometric design of runways and taxiways.

Theory: Railway Engineering

1. Railway Engineering: Role of railways in transportation system, railways and highways comparisons; classification of Indian railways, railway zones in India, railway gauges, creep, coning of wheels and traction resistance 5 Lectures

2. Permanent ways: Rail & rail joints (welding of rails, LWR, SWR, CWR), Sleepers, Ballast, Formation and its drainage, track fitting and fastening, Stresses in railway tracks. 6 Lectures

3. Geometric design of railway track: Alignment and grades, cross section and its elements (at filling & cutting), grade compensation, cant and cant deficiency, negative cant and widening of gauges on curves, curves used for railway track (horizontal and vertical curves), level crossing. 8 Lectures

4. Points and crossing, Stations and yards, Signals and Interlocking system. 6 Lectures 5. Railway System in the Urban Area: Surface railways, Elevated railways, Underground railway

4 Lectures

Airport Engineering 6. Airport Overview: Air transportation in India, Classification of airports, Airport terminology, Outline of technical planning process, Terminal building, Visual Aids, Orientation of Runway. 6 Lectures 7. Geometric design of Runway &Taxiway, Structural design of airport pavement.

7 Lectures

Scheme of Examination: Class test I/Assignment : 5Marks Class test II/Assignment : 5Marks Mid Semester Examination : 20Marks End Semester Examination : 70 Marks

Text Books: 1. Sexena, S.C. Arora, S. P., A text Book of Railway Engineering, DhanpatRai& Sons, New Delhi. 2. Agarwal, M. M. & Satish Chandra, Railway Engineering, Oxford University Press, New Delhi. 3. Khanna and Arora, Airport planning and design, DhanpatRai& Sons, New Delhi. 4. Rangwala S.C., Airport Engineering, Charotar publishing house Reference Books: 1. Mundary, J.S. Railway Track Engineering, Tata McGraw Hill, New Delhi. 2. Hay, W. W., Railroad Engineering, John Wiley and Sons, New York 3. SaxenaS.C.,Airport Engineering(Planning and Design),CBS Publications & Distributors, New Delhi 4. Horonjeff .R and Francis X.McKelvey, Mc Grow Hill, New York

Expected Outcome: The students should be able to carry out railway track design, signal design, should have awareness of railway track materials and construction. The students should be able to plan and design the airport elements.