Code No. 3025

FACULTY OF ENGINEERING
B.E. 3/4 (Civil) I-Semester (Supplementary) Examination, June/July 2011
TRANSPORTATION ENGINEERING

Time : Three Hours]

[Maximum Marks : 75

Answer **ALL** questions from Part-A.

Answer any **FIVE** questions from Part-B.

PART—A (Marks : 25)

1. Write the need for integration of horizontal and vertical alignment. 2

2. What are the studies required to improve intersections at grade ? 2

3. Differentiate between Bitumen and Tar. 2

4. Write the importance of softening point of Bitumen in Bituminous Road Construction. 2

5. Write the importance of 85th and 98th percentile speeds in traffic engineering. 3

6. Write any three functions of ballast and state its cross slope specification when crushed stone used. 3

7. Draw a typical schematic view of imaginary surfaces with reference to runway, take-off and approach. 3

8. Write the dimensions of Rail sections of BG and MG, as per Indian Standards. 3

9. Determine Airport reference temperature for the following data :—

    Mean of maximum daily temperatures = 51°C

    Mean of average daily temperatures = 41°C. 2

10. State the concept of layer theory used for design of pavements. 3

PART—B (Marks : 50)

11. (a) Write any six salient features of Lucknow Road Development Plan. 5

    (b) A vehicle is travelling at an average speed of 120 km/hr, on a downward gradient of 2%, with total reaction time as 2·5 seconds and the coefficient of longitudiual friction between vehicle tyres and surface of pavement as 0·35. Determine safe-stopping sight distance. 5

12. (a) Determine practical capacity of the weaving section of a Rotary from the following traffic data :—

   Width of weaving section = 14·6 m

   Average entry width of the rotary = 10·2 m

   Length of weaving section between the ends of the channelizing islands = 57·2 m

   Proportion of weaving traffic = 0·71.

   6

   (b) Explain the concept of signal design.

   4

13. (a) Write the different methods employed for compaction of subgrade soil and state how it is useful for determination of CBR value.

   5

   (b) What are the drainage considerations adopted for design of flexible pavement layers with reference to IRC-37—2002. Draw a typical sketch showing drainage blanket and drawdown drain.

   5

14. (a) Derive an expression for determination of superelevation provided for geometric design of railway track. Use standard notations.

   5

   (b) Draw the following fixtures used in railway track and write their standard dimensions :—
   (i) Metal key
   (ii) Canted bearing plate.

   5

15. (a) Write various types of aircrafts and their characteristics used for various components of airport.

   5

   (b) Write the method of orientation of runway using wind rose diagram and how it is prepared.

   5

16. (a) State critical locations on rigid pavement slab considered for design and write why warping stress at the corner region is not considered in IRC method of rigid pavement design.

   5

   (b) Distinguish between cutbacks and emulsions used as highway materials with reference to their basic properties.

   5

17. Write short notes on any **FOUR** of the following :—
   (a) The phenomenon of curling of concrete pavement slabs
   (b) Corrections to basic runway length
   (c) Construction methods of Railway
   (d) Critical combination of stresses due to wheel load and temperature stresses in rigid pavement
   (e) Water absorption and soundness of road aggregates.

   4×2·5=10