23/11/13

Roll No. | | | | | | | | | | |

B.E / B.Tech (Full Time) DEGREE END SEMESTER EXAMINATIONS, NOV / DEC 2013

CIVIL ENGINEERING BRANCH

Seventh Semester

CE 9405 RAILWAYS AND AIRPORTS ENGINEERING

(Regulation 2008)

Time: 3 Hours *Graph sheet be given on demand* Max. Marks 100

Instructions: Answer ALL Questions.
Draw neat sketches wherever required.

PART - A (10 x 2 = 20 Marks)

1. What is creep of rails? What are its effects on railway tracks?
2. The ruling gradient of a broad gauge track is 1 in 250. A curve of 3° is superimposed on the above track section. What should be the actual ruling gradient?
3. Compare any two basic plannings for MRTS (Mass Rapid Transit System) and suburban railways.
4. What is track circuiting? What is its function?
5. State any two modern methods in railway track construction.
6. Enumerate any two types of railway track maintenance and state the function of any one of them.
7. State any four elements of airport architecture.
8. What is meant by zoning law? Why is it important for an airport area?
9. List any four factors which differentiate the design of highway and runway flexible pavements.
10. State any four components of a runway geometric design.

PART – B (5 x 16 = 80 marks)

11. (i) Derive an equation for the super-elevation with reference to the gauge, speed and radius of curvature of a railway track. (8)

    (ii) A 6° curve branches off from a 3° main curve in an opposite direction in the layout of a broad gauge yard. Determine the speed restriction on the main line if the speed of the branch line is limited to 35 km/h. Cant deficiency is 75mm. (8)

12. a) Explain the following stations and yards with neat sketches: (16)

    (i) A crossing station
    (ii) A junction station.
    (iii) A terminal station
    (iv) A typical marshalling yard.

OR

12. b) (i) Draw a neat sketch of a left hand 'points and crossings' and show its different parts. (8)

b) (ii) Illustrate with a neat sketch, locations and functions of various signals in a railway station yard. (8)

13. a) Discuss different stages of railway track construction with neat sketches. (16)

OR

b) Explain with neat sketches how surface and sub-surface water can be intercepted and removed from a railway track. (16)

14. a) Discuss any eight factors to be taken into consideration for selection of a suitable site for an international airport. (16)

OR

b)(i) Illustrate with neat sketches limiting heights of objects in the approach and turning zones of an instrument runway. (10)

b)(ii) Define the clear zone in an airport and state its importance. (6)

15. a) Table below gives the average wind data of an airport site when the wind intensity is above 6 km/h. Draw a suitable wind rose diagram and find out orientations of two best runways. Determine the percentage of time in a year during which the runways could be used for flights if the maximum deviation of landing and takeoff is permitted upto 33.75°: (16)

Wind Direction	Percentage	Wind Direction	Percentage
N	6.6	S	7.7
NNE	10.3	SSW	14.3
NE	8.1	SW	10.6
ENE	3.9	WSW	5.7
E	1.8	W	3.9
ESE	0.9	WNW	0.5
SE	0.4	NW	0.3
SSE	4.1	NNW	4.2

OR

b) (i) An airport is proposed at an elevation of 400m above mean sea level. The mean of average daily temperatures of the hottest month are 44.8°C and 26.2°C respectively. The maximum elevation difference along the proposed profile of the runway is 6.3m. Determine the actual length of the runway if the basic length of the runway is 1260m. (8)

b) (ii) Draw neat sketches of the following with reference to an instrument runway and state their significance: (8)

- Safety area
- Cross section of a typical runway.