Reg. No. _____

Karunya University

(Declared as Deemed to be University under Sec.3 of the UGC Act, 1956)

End Semester Examination – November / December 2009

Subject Title: HIGHWAYS AND RAILWAYS ENGINEERING **Time : 3 hours**
Subject Code: CE264 **Maximum Marks: 100**

(IRC 37-2001 Permitted)

Answer ALL questions

PART – A (10 x 1 = 10 MARKS)

1. State the objectives of IRC.
2. Classify urban roads.
3. Define grade compensation.
4. Define stopping sight distance.
5. Name the various factors that affect the design of flexible pavement.
6. Name the various components of a pavement.
7. Define sleeper density.
8. Name the various types of rails used in Indian railways.
9. State the objects of signaling.
10. Define turn out.

PART – B (5 x 3 = 15 MARKS)

11. Brief the role of transportation in national development.
12. Name the various factors that affect super elevation.
13. Compare rigid and flexible pavement.
14. Compare highway and railway transportation.
15. What are the basic requirements to be provided in a railway station?

PART – C (5 x 15 = 75 MARKS)

16. Write short notes about the following
    a. CRRI b. Factors controlling selection of highway alignment

(OR)

17. Explain the various highway cross sectional elements.

18. A vertical summit curve is formed at the intersection of two gradients 3% and – 5%. Design the length of summit curve to provide a stopping sight distance for a design speed of 80 kmph. Coefficient of friction = 0.35, and reaction time of driver = 2.5 secs. Assume any other data if required.

(OR)

19. Calculate the length of transition curve from the following data
    Design speed = 65 kmph, Radius of circular curve = 220m, Allowable rate of introduction of super elevation = 1 in 150, Width of pavement including extra widening = 7.5 m. Assume any other data if required.

20. A two lane two way carriageway carries traffic of 1500 cv/day. The rate of growth of traffic is 5% per annum. The design life is 15 years. The vehicle damage factor is 2.5. The CBR value of soil is 6%. Design the flexible pavement.

(OR)

21. Briefly outline the IRC method for designing rigid pavement.

22. Draw a typical cross section of a railway track and explain the functions of various components of a railway track.

(OR)

23. Write short notes on the following:
    a. Selection of gauge (5)
    b. Requirements of good sleepers (5)
    c. Coning of wheels (5)

24. With a neat sketch explaining various types of signal.

(OR)

25. Write short notes about the following (8+7)
    a. Track circuiting b. Gradients used in railways