

Reg. No. \_\_\_\_\_

# Karunya University

(Karunya Institute of Technology and Sciences)

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

## End Semester Examination – April/May 2011

Subject Title: HIGHWAYS AND RAILWAYS ENGINEERING

Time: 3 hours

Subject Code: CE264

Maximum Marks: 100

### Answer ALL questions

#### PART – A (10 x 1 = 10 MARKS)

1. How are rural roads classified?
2. State the basic requirements of an ideal alignment between two terminal stations.
3. What is meant by super elevation?
4. Mention the factors influencing the overtaking sight distance.
5. What is ESWL?
6. What are the requirements of a good joint?
7. What is creep in rail?
8. List the ballast types.
9. What is throw of a switch?
10. What is a relay?

#### PART – B (5 x 3 = 15 MARKS)

11. What are the cross sectional elements of highway?
12. What is the necessity of transition curves?
13. What are the different layers of flexible and rigid pavements?
14. List the functions of ballast in railway.
15. What do you understand about interlocking in railway?

#### PART – C (5 x 15 = 75 MARKS)

16. Discuss the development of roads in India.  
(OR)
  17. Illustrate with neat sketches, how obligatory points control alignment of highways.
  18. a. Explain in a sequential order, steps for practical design of super elevation (7)  
b. At a section of a National Highway, due to site considerations a radius of curvature of 250m has to be provided. Design the super elevation. State whether the speed should be restricted? (8)
- (OR)
19. a. Explain the methods of designing the transition curve length. (7)  
b. A valley curve is formed by a descending gradient of 1 in 25 meeting an ascending gradient of 1 in 30. Design the length of valley curve to fulfill both comfort condition for a design speed of 80 kmph ( $C= 0.6 \text{ m/sec}^2$ ) and a head light sight distance of 127 m for this speed. (8)

[P.T.O]

20. Compare rigid and flexible pavements.

(OR)

21. Design a flexible pavement as per IRC in a hilly area with the following data.

Present traffic intensity	=	350 vehicles/day
Design period	=	8 years
Traffic growth rate	=	7.5%
CBR value	=	10%
Lane distribution factor	=	0.75
Vehicle damage factor	=	2.5

22. Explain the advantages and disadvantages of different types of sleepers.

(OR)

23. Illustrate the functions of permanent way.

24. Calculate all the necessary elements required to set out a 1 in 8½ turnout taking off from a straight B.G track with its curve starting from the toe of the switch (i.e) tangential to the gauge face of the outer main rail and pass through theoretical nose of crossing. The heel divergence (d) is 11.4cm.

(OR)

25. How are railway stations classified? Explain the features of each station.