M S RAMAIAH INSTITUTE OF TECHNOLOGY
(AUTONOMOUS INSTITUTE, AFFILIATED TO VTU)
BANGALORE – 560 054
SEMESTER END EXAMINATIONS – JANUARY 2015

Course & Branch	: **B.E: Civil Engineering**	**Semester**	: **V**
Subject	: **Transportation Engineering-II**	**Max. Marks**	: **100**
Subject Code	: **CV502**	**Duration**	: **3 Hrs**

Instructions to the Candidates:
- Answer one full question from each unit.

UNIT – I

1. a) Explain the advantages of rail transport in the development of the country. (10)

   b) Mention the different gauges that are used in Indian railways. Discuss the factors affecting adoption of a particular gauge. (05)

   c) What is coning of wheels? What are the advantages of coning of wheels? (05)

2. a) Draw a neat sketch of a straight broad gauge railway track in an embankment for a single line. (05)

   b) What is permanent way? Mention the requirements of an ideal permanent way. (05)

   c) A locomotive with four pair of driving wheels is required to haul a train at a speed of 51.5k.m.p.h. The axle load of the driving wheel of the engine is 15.25 tonne. If the train ascends a slope 1in 180 with a 2 degree curve, how much reduction in speed should be made? (10)

UNIT – II

3. a) Define various types of gradient adopted in railways. What is Grade Compensation? (06)

   b) A 4° curve diverges from a 2° main curve in reverse direction in the layout of a B.G yard. If the speed on the branch line is restricted to 40 k.m.p.h., determine the restricted speed on the main line. (06)

   c) Determine the necessary elements of a turnout taking off from a B.G straight track, when the following data is given: (08)

   i) Number of crossing=1in 12

   ii) Angle of switch(β)=1°12'36"

   iii) Heel divergence(d)=11.75 cm

4. a) What is meant by super elevation? With usual notations derive an expression for super elevation. Mention the maximum values for the same. (08)

   b) Draw a neat sketch of a left hand turnout and explain the working principle. (07)

   c) Determine the equilibrium cant for a 3^0 curved B.G track , if 20 trains,10 trains,9 trains, 5 trains are running at a speed of 50 kmph, 65 kmph, 80 kmph and 100 kmph. (05)

UNIT – III

5. a) Enumerate the various factors to be considered in the selection of suitable site for an airport. (07)

   b) The basic runway length at an elevation of 410 m is 2100m.The airport reference temperature is 32ºC and the following profile data is available. (08)

End to End of Runway(m)	Gradient (%)
0-300	+1.0
300-900	-0.5
900-1500	+0.5
1500-1800	+1.0
1800-2100	-0.5
2100-2700	-0.4
2700-3000	-0.1

   Find the actual length of runway at the site

   c) With a neat sketch, explain how basic runway length is determined based on normal landing case. (05)

6. a) Design an exit taxiway joining a runway and a parallel main taxiway .The total angle of turn is 35º and the maximum turn-off speed is 80kmph. (10)

   Assume the following data:

   Radius of entrance curve=731m

   Runway width=45m

   Taxiway width=22.5m

   Suggest the maximum separation clearance and draw a neat sketch showing all the design elements.

   b) With a neat sketch describe the procedure adopted for orientating a runway with wind direction, duration and intensity. (10)

UNIT – IV

7. a) With a neat sketch, show the various components of a harbor and explain the functions of each. (10)

   b) What are the requirements of a good harbor? (05)

   c) With a neat sketch explain the phenomena of littoral drift? (05)
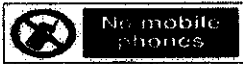
8. a) Explain briefly (10)

    i) Dry and Wet Docks

    ii) Quays

  b) What are the characteristics of mound break waters? (05)

  c) Classify different types of breakwaters depending upon (05)

    i) Construction materials

    ii) Functions they perform

UNIT – V

9. a) Explain briefly the stages in transport planning process. (10)

  b) Explain the advantages and disadvantages of following with neat sketch. (10)

  i) Grade separated intersection

  ii) Clover leaf interchange

10. a) With a neat sketch explain the elements of rotary intersection? What are its advantages? (10)

  b) Explain the nature of present difficulties in urban traffic and remedial measures associated with it. (10)

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