

Code :R7320106

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III B.Tech II Semester(R07) Regular & Supplementary Examinations, April/May 2011
TRANSPORTATION ENGINEERING
(Civil Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE questions
All questions carry equal marks

1. Explain the classification of highway system adopted in India for urban and non-urban roads. Describe the features of the roads at each level.
2. (a) Discuss the importance of stopping sight distance at intersections and the factors that influence the visibility at intersections. Explain the design principle of an intersection to ensure the minimum sight distance required.
(b) Calculate the minimum sight distance required to avoid a head-on collision of two cars approaching from the opposite direction at 100 kmph and 80 kmph on a road section. Assume a reaction time of 2.5 seconds, coefficient of friction of 0.7 and brake efficiency of 50 percent in either case.
3. How many types of speeds are used in the traffic analysis? Explain each of them and give their importance. Also explain how the speed data can be represented graphically.
4. Explain the following with the help of suitable sketches:
 - (a) Longitudinal Markings
 - (b) Markings at Intersections
5. (a) What are the basic requirements of intersection at grade?
(b) Explain briefly about unchannelized intersection and channelized intersections.
6. Define gauge of a railway track Enumerate different gauges used in India and discuss their suitability at different locations with reasons.
7. What are the objections for providing curves on a railway track? Under what circumstances the use of curves is warranted?
8. What are the various features which are shown in the topographical map of an airport? Sketch a typical topographical map for an airport which is planned for two parallel runways.

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1. (a) What are the significant recommendations of Jayakar committee? Mention how these recommendations helped in road development in India.
(b) Explain the salient features of Nagpur road development plan.
2. (a) Derive an expression for overtaking sight distance on a two lane two way road. Support your derivation with a neat sketch showing the overtaking operation and various distance components involved.
(b) Calculate the OSD required on a National Highway with a design speed of 100 kmph. Take the rate of acceleration as 1.75 kmph/sec and assume any other data required suitably.
3. What are the various parking parameters about which data is collected in a parking study? Define and explain them. Explain clearly the method of Parking Inventory Study on a road section.
4. What is the need for road markings? Explain. With the help of neat sketches explain the meaning of various markings used at intersections. Also give their specifications.
5. What are the advantages and limitations of unchannelized and channelized intersections.
6. Why the uniformity of gauges is desirable in any country? Mention the demerits of non-uniformity of gauges.
7. (a) Define super elevation. What are the objects of providing super elevation on curves of a railway track?
(b) Prove that the speed 'V' of a vehicle on a curve is related to curvature by a formula $V = K\sqrt{R}$, where V is the speed and R is the radius.
8. Describe the influence of aircraft characteristics on airport planning and design .

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1. What are obligatory points? How do they influence the road alignment? With the help of neat sketches explain about various obligatory points.
2. Explain about the following:
 - (a) Camber
 - (b) Design Speed
 - (c) Transition Curves
 - (d) Extra widening
3. (a) What are the possible causes for accidents? Explain.
(b) What kind of data is collected in accident studies? Discuss.
4. Discuss about the use of road markings in ensuring road safety. Give suitable examples supported by neat sketches.
5. What is traffic rotary? What are its advantages and limitations, in particular reference to traffic conditions in India.
6. What are the factors affecting the choice of particular gauge. For connecting two industrial cities in India, Which gauge you will recommend and why?
7. (a) What are the objects of providing transition curves on railways? Explain as to how the length of a transition curve is decided.
(b) Determine the length of a transition curve for a M.G. Curve of 4° , having a cant of 8cm. The maximum permissible speed on curve is 60 Km/h.
8. (a) Explain in detail the different gear configuration generally used to support aircraft weight.
(b) Discuss the effect of noise on airport planning.

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1. Why Nagpur road development plan is considered as a mile stone in the history of road development in India? Discuss bringing out the salient features of the plan.
2. What do you understand by horizontal curve on a highway? Explain. Also explain the different geometric elements associated with the horizontal curves giving their necessity and objectives.
3. With the help of neat sketches explain the use of condition diagram and the collision diagram in the accident data collection and analysis.
4. How the road markings can be effectively used in controlling and regulating the traffic approaching an intersection? Explain by giving the sketches of various markings used for this purpose.
5. Explain grade separated intersections, their advantages and limitations.
6. Write a brief notes on Track-Structure recommended for B.G system on Indian Railways.
7. (a) Explain the necessity of widening of gauge on curves.
(b) If the wheel base of a moving vehicle is 4.12m, the degree of the curve is 5° and flanges project 3.2cm below the top of rail. Determine extra width required on curve.
8. (a) Explain the procedure of orienting the runway.
(b) Summarize briefly the various runway geometrics as recommended by ICAO.
