

[Total No. of Questions: 12]

[Total No. of Printed Pages: 4]

UNIVERSITY OF PUNE
[4364]-415
B. E. (Civil) Examination – 2013
TRANSPORTATION ENGINEERING II
(2008 Course)

[Time: 3 Hours]

[Max. Marks: 100]

Instructions:

- 1 *Answer Q1 or Q2, Q3 or Q4, Q5 or Q6 from Section I and Q7 or Q8, Q9 or Q10, Q11 or Q12 from Section II*
- 2 *Answers to the two sections should be written in separate answer-books.*
- 3 *Black figures to the right indicate full marks.*
- 4 *Your answer will be valued as a whole*
- 5 *Neat diagrams must be drawn wherever necessary.*
- 6 *Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.*
- 7 *Assume suitable data, if necessary.*

SECTION – I

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|-----------|---|--|-----|
| Q.1 | A | State the comparison between First road development plan and Second Road development plan. | [6] |
| | B | Explain in brief the Role of Transportation in social, economical and political development of any country | [6] |
| | C | Write a short note on Traffic signs. | [4] |
| OR | | | |
| Q.2 | A | Why Jaykar committee was formed? Also state the various recommendations of jaykar committee. | [6] |
| | B | Explain in brief the system of classification of roads, as per Nagpur road plan. | [6] |
| | C | Write a short note on spot speed studies. | [4] |
| Q.3 | A | Define the following Terms:
1) Carriageway width 2) Formation width
3) Design speed 4) Gradient 5) Camber
6) Centrifugal Radio Or Impact factor | [6] |

- B Calculate the Absolute Minimum sight Distance for a level road, at the design speed of 80 kmph. [6]
Assume suitable data as per IRC recommendations.
- C State the various objects of providing extra widening on Horizontal curves. [4]
- OR**
- Q. 4 A Discuss in brief the various factors controlling Highway Alignment with suitable sketches. [6]
- B What is Horizontal Transition curve? Why it is necessary? [4]
- C Define the following Terms: [6]
1) Camber 2) Superelevation 3) Grade compensation
4) Alignment 5) Right of way 6) Head light sight Distance
- Q. 5 A A Two lane two way road is at present carrying a traffic of 1000 CVD. It is to be strengthened for growing traffic needs. The VDF has been found to be 3.0 The rate of growth of traffic is 10% per annum. The period of construction is 5 years. The pavement is to be designed for 15 years after completion. Calculate the cumulative standard axles to be used in design. [6]
- B State comparison between Rigid pavement and Flexible pavement [6]
- C Why joints are necessary in concrete pavements. State the various types of joints. Explain any one in brief. [6]
- OR**
- Q. 6 A Explain in brief the following Terms: [6]
1) GSB 2) Prime coat 3) Tack coat
4) WMM 5) Cutback bitumen 6) Tar
- B Explain in brief the procedure of carrying out an Impact Test on Road Aggregate in labrotory. [6]
- C Explain in brief the CBR test and its importance in design of Flexible pavement. [6]
- SECTION II**
- Q. 7 A Describe the movement of aircraft in three principal axes with the help of a neat sketch. [6]
- B Define Runway. State various basic patterns of configurations of the runway with neat sketches. [4]
- C What is meant by basic runway length? Discuss the corrections that are to be applied for determining basic runway length. [6]

OR

- Q. 8 A State the advantages and Limitations of air transportation. [6]
- B Define the following terms: [6]
 1) Cross wind component 2) Calm period
 3) Ground speed 4) Air speed
- C Draw a neat labeled sketch of an aeroplane to show various component parts. [4]

- Q. 9 A Explain in brief the following: [8]
 1 Afflux 2) Scour Depth
- B The following are the costs of one pier and one superstructure of a multiple span bridge for various span lengths. The cost of superstructure span excludes the cost of railing and flooring system. Calculate the economic span: [8]

Span (m)	04	08	12	15
Cost of superstructure in (Rs)	1700	7000	16000	24000
Cost of one pier (Rs)	22200	23200	23000	23600

OR

- Q. 10 A The catchment area of a stream is of sandy soil with thick vegetation cover and the area of the catchment is 8000 hectares. The length of the catchment is 20km and the fall in level from the critical point to the bridge site is 160 meters. Calculate the peak runoff for designing the bridge if the severest storm recorded yields 16 cm of rain in 4 hours. [Assume a coefficient of account for losses due to absorption =0.1 and coefficient to account for distribution of rainfall in space =0.76] [8]
- B A bridge is proposed to be constructed across an alluvial stream carrying a discharge of 300 m³/sec Assuming the value of silt factor =1.1, determine the maximum scour depth when the bridge consists of [8]
 1) Two spans of 35 m each
 2) Three spans of 30 m each
- Q. 11 A State precisely the purpose of providing bearings in bridges. Name the various types of bearings [6]
- B Explain with a neat sketch the following: [6]
 1) Traverser bridge 2) Cable stayed bridge

C How will you account for the following in the design of a highway bridge: [6]
1) Wind Load 2) Impact effect 3) Forces due to water current

OR

Q. 12 A Define Abutment Give detail classification of abutment which additional force is required to consider for design, compare to bridge pier and why? [6]

B Explain with neat sketch the following: [6]
1) Box culvert 2) Pipe Culvert

C Explain in brief any one method of erection of bridge superstructure. [6]