

320514(20)

B. E. (Fifth Semester) Examination, April-May 2020

(Old Scheme)

(Civil Engg. Branch)

TRANSPORTATION ENGINEERING-I

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : Attempt all questions. Part (a) of each question is compulsory. Attempt any two parts from (b), (c) and (d) from each question.

1. (a) Define camber for a highway. 2
- (b) Explain the importance of first twenty year road plan in highway planning of our country. Explain also the salient features of the plan. 7

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- (c) Explain, the following terms : 7
- (i) Transition curves
 - (ii) Alignment of highway on hilly area
- (d) Calculate the stopping sight distance for a two way traffic highway for which the design speed is 80 kmph. The rate of acceleration of the fast moving vehicle may be assumed as 3.6 kmph/sec and the reaction time as 2.5 sec. 7
2. (a) Define 3E's theory of Traffic Engineering. 2
- (b) What do you mean by Origination and Destination Study? How it is conducted? How it is useful for better traffic control? 7
- (c) Differentiate between the following : 7
- (i) Warning sign and informatory sign
 - (ii) Traffic volume and traffic density
- (d) Explain the following terms : 7
- (i) Soil subgrade reaction
 - (ii) Ductility of bitumen test. egares

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3. (a) What is rigid pavement? 2
- (b) Describe in details about the GI method of designing of flexible pavement. 7
- (c) Explain the following terms : 7
- (i) Flexible pavement
 - (ii) Vehicle damage factor
- (d) Calculate the stresses at interior, edge and corner of a cement concrete pavement by Wastergaards stress equations : 7
- Modulus of elasticity of concrete : $3.0 \times 10^5 \text{ kg/cm}^2$
- Poisson's ratio of concrete : 0.15
- Thickness of concrete pavement : 20 cm
- Wheel load : 4100 kg
- Radius of loaded area : 15 cm
- Modulus of subgrade reaction : 2.0 kg/cm^2 .
4. (a) What do you mean by Penetration Macadam? 2
- (b) Describe the following : 7
- (i) Contraction joint

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- (ii) Longitudinal joint
- (c) Describe in brief the construction steps for WBM roads. 7
- (d) What are the different types of failure on bituminous roads and how they are repaired? 7
5. (a) What do you mean by instrumental landing system? 2
- (b) What are the various factors which you would consider while selecting a suitable site for an airport? Explain each factor briefly. 7
- (c) The length of a runway under standard conditions is 1950 m. The airport site has an elevation of 300 m and the reference temperature as 32°C. If the runway is to be constructed with the effective gradient of 0.3%, determine the corrected runway length. 7
- (d) Explain the following : 7
- (i) Wind rose diagram
- (ii) Zoning laws