

6E3036

Roll No. _____

Total No of Pages: **4**

6E3036

B. Tech. VI Sem. (Main & Back) Exam. May/June-2014

Civil Engineering

6CE5 Transportation Engineering-I

Time: 3 Hours

Maximum Marks: 80

Min. Passing Marks: 24

Instructions to Candidates:-

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly.

Units of quantities used/ calculated must be stated clearly.

Use of following supporting material is permitted during examination.

1. _____

2. _____

UNIT-I

Q.1 (a) Describe any four characteristics of road transport. [8]

(b) Write salient features (any six) of second twenty year road development plan. [8]

OR

Q.1 (a) Enumerate various factors controlling highway alignment. Also explain any one factor in brief. [2+2=4]

(b) Calculate the total lengths of NH, SH and MDR needed in a district as per second 20-year road development plan (i.e. Bombay Road Plan). The data collected from district are as follows:

Total area = 18400 km²; Undeveloped area = 4800km²; Developed & agricultural area = 8000 km² [3 x 4=12]

Population Range	No. of towns
< 500	200
500 – 1,000	350
1,000 – 2,000	750
2,000 – 5,000	360
5,000 – 10,000	150
10,000 – 20,000	80
20,000 – 50,000	25
50,000 – 1,00,000	10
>1,00,000	5

UNIT-II

- Q.2 (a) List out any four desirable properties of road aggregates. Describe procedure for Los Angeles Abrasion Test for road aggregates. [2+6=8]
- (b) Describe the method for construction of WBM road. [8]

OR

- Q.2 (a) Write any six major differences in bitumen and tar in tabular form. [6]
- (b) Describe the construction steps for premixed Bituminous carpet. Also give the quantity of bitumen required for tack coat, prime coat and pre mix. [8+2=10]

UNIT-III

- Q.3 (a) Explain total reaction time of driver by 'PIEV' theory. [6]
- (b) The speed of overtaking and overtaken vehicles are 70 and 40 Km/h respectively on a two way traffic road. If the acceleration of overtaking vehicle is 0.99 m/sec²,
- (i) Calculate safe overtaking sight distance.

(ii) Find minimum length of overtaking zone.

(iii) Draw a neat sketch of the overtaking zone and show position of sign posts.

[4+4+2=10]

OR

Q.3 (a) Derive an expression for finding the stopping sight distance at level and at grade on a highway. [8]

(b) A state highway with design speed 80 Km/h and having pavement width 7.0 m is passing through rolling terrain in heavy rain fall area. It has a horizontal curve of radius 500 m. Design the length of transition curve assuming suitable data. [8]

UNIT-IV

Q.4 (a) Describe traffic volume study. Explain any three objects of traffic volume studies. [1+3=4]

(b) Explain the procedure to measure spot speed by enoscope with diagram. [4+2=6]

(c) Write any six advantages of traffic signals. [6]

OR

Q.4 (a) Write any six causes of accidents. [6]

(b) Explain any five of the followings: [5 x 2=10]

(i) Informatory sign.

(ii) Off street parking.

(iii) Application (any 2) of O & D studies.

- (iv) Grade separated intersection.
- (v) "3 Es" method for reduction accidents.
- (vi) Traffic signals.
- (vii) Road markings.

UNIT-V

- Q.5 (a) Describe in brief any four factors considered for design of pavements. [6]
- (b) Describe C.B.R. method adopted for design of flexible pavements as per IRC:37 guidelines. [10]

OR

- Q.5 (a) Describe followings for the alignment of hill roads:
- (i) Resisting length of hill road. [2]
 - (ii) Trace cut for hair pin bends. [2]
- (b) Describe any four major points to be considered for road side development and arboriculture. [6]
- (c) Write short notes on any 4 of the followings:
- (i) Road side drains in hill roads.
 - (ii) Sub-Surface drainage in hill roads.
 - (iii) Cross-drainage in hill roads.
 - (iv) Problems in maintenance of hill roads.
 - (v) Terrain classification on the basis of cross-slope. [6]