## Code : 011619

### B.Tech 6th Semester Exam., 2018

### TRANSPORTATION ENGINEERING—I

Time : 3 hours

Full Marks : 70

*Instructions* :

(i) The marks are indicated in the right-hand margin.

(ii) There are **NINE** questions in this paper.

(iii) Attempt **FIVE** questions in all.

(iv) Question No. **1** is compulsory.

1. Choose the correct answer of the following (any seven) :                2×7=14

   (a) The minimum value of camber provided for thin bituminous surface hill roads is

      (i) 2·2%     (ii) 2·5%

      (iii) 3·0%     (iv) 3·5%

   (b) The design of horizontal and vertical alignments, superelevation, sight distance and grades is worst affected by

      (i) width of the vehicle

      (ii) length of the vehicle

      (iii) height of the vehicle

      (iv) speed of the vehicle

   (c) Traffic engineering only includes the

      (i) planning of regulatory measures

      (ii) design and application of control devices

      (iii) analysis of traffic characteristics

      (iv) All of the above

   (d) Border Roads Organization for hilly regions was formed in

      (i) 1947

      (ii) 1954

      (iii) 1958

      (iv) 1960

   (e) Traffic surveys are carried out to

      (i) know the type of traffic

      (ii) determine the facilities to traffic regulations

      (iii) design the proper drainage system

      (iv) All of the above

   (f) In water-bound macadam roads, binding material is

      (i) sand

      (ii) stone dust

      (iii) cement

      (iv) brick dust

(g) The design of flexible pavements is based on

   (i) mathematical analysis

   (ii) empirical formulae

   (iii) a compromise of pure theory and pure empirical formula

   (iv) None of the above

(h) The efficiency of the brakes of a vehicle depends upon the

   (i) condition of road surface

   (ii) condition of the tyres

   (iii) presence of the show moisture

   (iv) All of the above

(i) The maximum safe speed on roads, depends on the type of

   (i) highway

   (ii) road surface

   (iii) curves

   (iv) All of the above

(j) On the recommendations of Indian Road Congress, the ruling gradient in plains is

   (i) 1 in 15      (ii) 1 in 20

   (iii) 1 in 30     (iv) 1 in 45

2. (a) What are the desirable properties of soil as a highway material?    7

(b) Write a note on the common methods of on-street parking.    7

3. (a) Elaborate on the factors to be considered when designing pavements.    7

(b) Explain the various factors which affect the location of exit taxiway. What do you understand by optimum location of exit taxiway?    7

4. (a) How are the surface conditions of flexible and rigid pavements evaluated? What are the categories of overlay combinations?    8

(b) On what factors does the selection of the base and surface course of the pavement depend upon?    6

5. (a) What should be the equilibrium cant on an MG curve of four degrees for an average speed of 66 kmph? Also find out the maximum permissible speed after allowing the maximum cant deficiency.    8

(b) How are signals classified? Explain with neat sketches, the working of the semaphore signals.    6

( 5 )

6. (a) Explain the construction procedure of a water-bound macadam road. 7

   (b) Explain about the typical, flexible pavement failures. 7

7. (a) Distinguish between collision and condition diagrams. Explain different measures to be adopted for the reduction of accidents. 7

   (b) What are the different tests to be organized on bitumen sample? Explain how the test results are used for selecting as binding material in road construction. 7

8. A pre-timed four-phase signal has normal flow rates for the first three phases as 200, 187 and 210 vehicles/hr with saturation flow rates of 1800 vehicles/hr/lane for all phases. The lost time is given as 4 seconds for each phase. If the cycle length is 60 seconds, using Webster's method, determine the effective green time of 4th phase. 14

9. (a) What are the requirements of filler and sealer materials for using them in the construction of c.c. pavements? 7

   (b) What are desire lines? Explain roadside interview method of organizing OD studies. 7

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