Total No. of Questions : 8] *[Total No. of Printed Pages : 3*

Roll No .....

CE-6004 (CBGS)

B.E. VI Semester

Examination, May 2019

Choice Based Grading System (CBGS)

Highway Engineering

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions.

ii) All questions carry equal marks.

iii) Solve all parts of any question in continuous at the same place.

1. Answer all parts of question

a) Enlist various contemporary road infrastructure projects for passenger traffic and freight traffic in India. Also mention key planning aspects to be considered in developing these projects. 7

b) A valley curve is formed by a descending gradient of 1in 30 meeting an ascending grade of 1 in 20. Design length of the valley curve to fulfill both comfort condition and head light sight distance requirements for a design speed of 90 KMPH. Allowable rate of change of centrifugal acceleration is 0.65 m/sec^3. Also determine the compensated gradient at the curve if the degree of the curve 3° is encountered if the ruling gradient of 6 percent. Assume reaction time of 2.5 sec and coefficient of lateral friction is 0.15 and coefficient of longitudinal friction is 0.40 7

2. Answer all parts of question

a) Briefly explain the significance of Prime coat, Tack Coat and Seal coat. 7

b) Differentiate water bound macadam and wet mix macadam. Also explain the role of granular layers in flexible and rigid pavements in three points. 7

3. Answer all parts of question

a) Mention the fundamental objectives of providing Highway drainage. Classify various types of highway drainage. 7

b) Briefly explain the process of four stage travel demand modelling for typical Public transit project in a city. 7

4. Answer all parts of question

a) Define airport reference temperature and estimate the airport reference temperature for the hottest month of the year from the following data. 7

	May		June		July
Day	Temperature, °C	Day	Temperature, °C	Day	Temperature, °C
1	45.8	1	42.3	1	38.4
2	43.7	2	47.6	2	34.6
3	41.6	3	43.9	3	37.2
4	49.8	4	40.7	4	32.9
5	47.5	5	41.1	5	30.8

b) The runway length required for the Engine failure case at sea level in standard atmospheric conditions is 3600 m. Runway length required for landing case at a level site at sea level in standard atmospheric conditions is 3400 m. Aerodrome reference temperature is 29°C and that of the standard atmospheric at aerodrome elevation of 400 m is 19.025°C . If the effective runway gradient is 0.75 percent, determine the runway length to be provided. 7

5. Answer any one part of question
   a) Classify various types of visual aids to be provided in Airport and mention its necessity. 14
   b) What are factors affecting type and intensity of airport lighting. Also list out various elements of airport lighting. 14

6. Answer any one part of question 14
   a) Define and classify
      i) Traffic Island,
      ii) Traffic intersection
      iii) Interchange.
   b) Draw a neat sketch of rotary intersection indicating all necessary elements. Also explain the design steps of rotary intersection. 14

7. Answer all parts of question
   a) Define distress. List various types of failures in flexible and rigid pavements 7
   b) Differentiate the properties of Bitumen and Bituminous concrete mix. 7

8. Answer all parts of question
   a) Enlist the factors for the selection of suitable site for major airport construction. Also briefly explain wind and visibility factors. 7
   b) Briefly explain the role of cross wind component, wind coverage and wind rose diagram in runway design. 7

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