Reg. No. :

Question Paper Code: 44103

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2020

Fourth Semester

Civil Engineering

14UCE403 - HIGHWAY ENGINEERING

(Regulation 2014)

Duration: One hour   Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

1. IRC was setup in the year

    (a) 1930   (b) 1934   (c) 1940   (d) 1943

2. Border Roads Organisation for hilly regions, was formed in

    (a) 1947   (b) 1954   (c) 1958   (d) 1960

3. Carriageway width for a single lane is

    (a) 3 m   (b) 4 m   (c) 3.8 m   (d) 2.5 m

4. The type of transition curves generally provided on hill roads, is

    (a) circular   (b) cubic parabola
    (c) Lemniscate   (d) spiral

5. Design of flexible pavements is based on

    (a) mathematical analysis
    (b) empirical formulae
    (c) compromise of pure theory and pure empirical formula
    (d) none of these

6. The thickness of a pavement may be reduced considerably by

    (a) compaction of soil   (b) stabilisation of soil

    (c) drainage of soil   (d) all the above

7. Percentage of free carbon in bitumen is

    (a) more than that in tar   (b) less than that in tar

    (c) equal to that in tar   (d) none of the above

8. Which of the following tests measures the toughness of road aggregates?

    (a) crushing strength test   (b) abrasion test

    (c) impact test   (d) shape test

9. Reflection cracking is observed in

    (a) Flexible pavement

    (b) Rigid pavement

    (c) Rigid overlay flexible pavement

    (d) Bituminous overlay over cement concrete pavement

10. Deflection measurement is done by

    (a) speedometer   (b) Benkelman Beam

    (c) Thickness gauge   (d) Deflecto meter

PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

11. Explain the various conventional engineering surveys for highway alignment.   (8)

12. The design speed on a road with curve of radius 400m is 90 kmph. The coefficient of friction is 0.15. Calculate :

    (i) super Elevation for full lateral friction

    (ii) coefficient of friction when no super elevation is provided

    (iii) Super election for equal pressure at inner and outer wheels   (8)

13. Design of flexible pavements: Which is located in hilly area present traffic intensity is 350 vehicles for a design period of 8 years and a traffic growth rate of 7.5% take lane distribution factor as 0.75 take VDF 2.5; design of CBR value for soil subgrade is 10%.   (8)

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14. List the types of bituminous roads. Explain the bituminous macadam type of road construction. (8)

15. Explain various types of failures in Rigid pavements. (8)

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