

Code No: R31016

R10**Set No. 1****III B.Tech I Semester Supplementary Examinations, May/June - 2015****TRANSPORTATION ENGINEERING-I****(Civil Engineering)****Time: 3 hours****Max. Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks
(IRC charts may be permitted)

- 1 a) What are the objectives of highway Planning? Explain. [8]
b) Explain briefly about the third 20 year road development plan. [7]
- 2 a) Derive an expression for super elevation in highways. [8]
b) What are the various types gradients used in highways? Explain briefly. [7]
- 3 a) What are the various objectives of traffic volume studies? [8]
b) Explain the difference between time head way and space headway. What are the factors that can influence headways [7]
- 4 a) What are the advantages of signalized intersections? [8]
b) Draw a typical sketch of grade separated intersection for a 4 legged junction permitting free left and straight movement only [7]
- 5 a) How do you determine the CBR of Soil in the laboratory? [8]
b) Differentiate between Tar and Bitumen. [7]
- 6 a) Determine the thickness of pavement thickness using all the materials by CBR method. Soil subgrade CBR 4.2%, compacted sandy soils having CBR 7.5%, Poorly graded soil with 22% CBR. Minimum thickness of bituminous concrete surfacing is 50mm. As per the present traffic survey ADT of commercial traffic is 1330. The annual growth of traffic is found to be 7.5%. The pavement construction is to be completed in 4 years from the after the last traffic count. [8]
b) Explain the concept used by McLeod for explaining the role of repetitive loads in pavements [7]
- 7 a) Find out the stresses due to wheel load for the following data using Westergaard equations. Maximum wheel load = 5200kg. Pavement thickness 200mm, Modulus of elasticity of concrete 3×10^5 kg/cm², Poisson's Ratio 0.15, modulus of subgrade reaction = 6.2 kg/cm³ and radius of contact area of wheel load = 160mm and also find out the location at which the maximum stress occurs due to corner loading. [8]
b) What are the criteria to be followed for the spacing expansion and contraction joints? [7]
- 8 a) Explain briefly about the steps involved in the construction of Bituminous concrete. [8]
b) Distinguish between built up spray grout and premix methods. [7]

-000-

Code No: **R31016****R10****Set No. 2****III B.Tech I Semester Supplementary Examinations, May/June - 2015****TRANSPORTATION ENGINEERING-I****(Civil Engineering)****Time: 3 hours****Max. Marks: 75****Answer any FIVE Questions****All Questions carry equal marks****(IRC charts may be permitted)***********

- 1 a) Explain the role of various surveys in fixing the alignment? [8]
b) Discuss about the road classification suggested by third Road development plan. [7]
- 2 a) Discuss about the effect of control points on the alignment of a highway. [8]
b) Derive an expression for extra widening in highways. [7]
- 3 a) What are the objectives of road makings? Explain briefly about the types of markings used in highways [8]
b) Distinguish between warning signs and informatory signs. [7]
- 4 a) What are the advantages of channelized intersections? [8]
b) The average normal flow of traffic on cross roads A and B are 500 and 350 PCU per hour; the saturation flows on these roads are estimated at 1450 and 1200 PCU per hour respectively. The all red time required for pedestrian is 12 seconds. Design two phase signal by Webster's method. [7]
- 5 a) What is Group index of soil and how do you find it? [8]
b) Differentiate between Tar and Bitumen. [7]
- 6 a) Determine the thickness of pavement thickness using all the materials by CBR method. Soil subgrade CBR 4.2%, compacted sandy soils having CBR 7.5%, Poorly graded soil with 22% CBR. Minimum thickness of bituminous concrete surfacing is 50mm. As per the present traffic survey ADT of commercial traffic is 1330. The annual growth of traffic is found to be 7.5%. The pavement construction is to be completed in 4years from the after the last traffic count. [8]
b) Discuss about the ESWL. [7]
- 7 a) Find out the stresses due to wheel load for the following data using Westergaard equations. Maximum wheel load = 5200kg. Pavement thickness 200mm, Modulus of elasticity of concrete $3 \times 10^5 \text{ kg/cm}^2$, Poisson's Ratio 0.15, modulus of subgrade reaction = 6.2 kg/cm^3 and radius of contact area of wheel load = 160mm and also find out the location at which the maximum stress occurs due to corner loading. [8]
b) What are the criteria to be followed for the spacing expansion and contraction joints? [7]
- 8 a) Explain briefly about the steps involved in the construction of CC pavements. [8]
b) Explain briefly about Sheet asphalt and Mastic Asphalt. [7]

-000-

Code No: R31016

R10**Set No. 3****III B.Tech I Semester Supplementary Examinations, May/June - 2015****TRANSPORTATION ENGINEERING-I****(Civil Engineering)****Time: 3 hours****Max. Marks: 75****Answer any FIVE Questions****All Questions carry equal marks****(IRC charts may be permitted)**

- 1 a) Determine the length of the various categories of the roads in a state in India by 20156 [8]
for the following the dated as per the guidelines of third road development plan. Area of
the state = 90000 Sq.km. Total no. of towns as per 1985 census 90 and the overall
density 82km/ 100 sq.km. area.
- b) What are the objectives of highway Planning? Explain. [7]
- 2 a) Explain the factors influencing the design of highway Geometric design [8]
- b) Design SSD and camber as per IRC guide lines for a National Highway in a heavy [7]
rainfall area having a bitumen surface course. The coefficient of longitudinal friction is
0.38.
- 3 a) Explain any two methods of OD studies and give briefly about the role of desire lines. [8]
- b) What is parking demand? Explain the methods of finding parking requirements in an [7]
area.
- 4 a) What are the advantages of rotary intersections? [8]
- b) The average normal flow of traffic on cross roads A and B are 500 and 350 PCU per [7]
hour; the saturation flows on these roads are estimated at 1450 and 1200 PCU per hour
respectively. The all red time required for pedestrian is 12 seconds. Design two phase
signal by Webster's method.
- 5 a) What is Group index? What is the data required for finding Group index of a soil? [8]
- b) Explain briefly about the material and equipment requirements for organizing different [7]
tests on coarse aggregates as per IRC standards.
- 6 a) Explain briefly about the assumptions made by Burmister in his approach while using [8]
layer concept?
- b) What is the influence of repetitive loads in the pavement design? [7]
- 7 a) Explain the Bradburry concept for load transfer in dowel bar system used in rigid [8]
pavements.
- b) Find out the radius of relative stiffness and radius of resisting section for the following [7]
data. Pavement thickness 200mm, Modulus of elasticity of concrete $3 \times 10^5 \text{ kg/cm}^2$,
Poisson's Ratio 0.15 ,modulus of subgrade reaction = 6.2 kg/cm^3 and radius of contact
area of wheel load = 160mm and also find out the location at which the maximum stress
occurs due to corner loading.
- 8 a) Explain briefly about Sheet asphalt and Mastic Asphalt. [8]
- b) Explain the difference between Prime coat and Tack coat. [7]

-000-

Set No. 4

III B.Tech I Semester Supplementary Examinations, May/June - 2015
TRANSPORTATION ENGINEERING-I
(Civil Engineering)

Time: 3 hours**Max. Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks
(IRC charts may be permitted)

- 1 a) Explain the role of various surveys in fixing the alignment? [8]
b) What are the objectives of highway Planning? Explain. [7]
- 2 a) Explain the method of introducing super elevation in field [8]
b) Derive an expression for extra widening in highways. [7]
- 3 a) Differentiate between off street parking and on street parking. [8]
b) What are the various causes for accidents in highways? [7]
- 4 a) What are the IRC recommendations for radius at entry, exit and central island? [8]
b) Draw a fully channelized right angled T-intersections [7]
- 5 a) What are the different types cutbacks used in pavement construction and explain briefly? [8]
b) Compute the Group index of soil for the following data. Soil passing through 0.074mm [7]
IS sieve is 46%, Liquid limit= 48% and Plastic limit 34%. Discuss the suitability of
material as soil subgrade.
- 6 a) What are the factors influencing the design of pavements? [8]
b) Explain the roles of base course and sub base courses in pavements. [7]
- 7 a) Discuss about the critical combination of stresses to be considered in rigid pavements. [8]
b) Find out the radius of relative stiffness and radius of resisting section for the following [7]
data. Pavement thickness 200mm, Modulus of elasticity of concrete $3 \times 10^5 \text{ kg/cm}^2$,
Poisson's Ratio 0.15 ,modulus of subgrade reaction = 6.2 kg/cm^3 and radius of contact
area of wheel load = 160mm and also find out the location at which the maximum stress
occurs due to corner loading.
- 8 a) Explain the construction procedure of Earth roads. [8]
b) Explain the difference between Prime coat and Tack coat. [7]

-000-