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**R16**

Code No: 138DZ

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech IV Year II Semester Examinations, December - 2020

PAVEMENT DESIGN  
(Civil Engineering)

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Time: 2 Hours

Max. Marks: 75

Answer any Five Questions  
All Questions Carry Equal Marks

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1. Discuss about the following variables that influence the pavement design: (a) load variables and b) structural variables. [7+8]
2. Differentiate EASL and Design EASL and discuss how Design EASL is estimated. [15]
- 3.a) Write the assumptions in multi layered elastic systems for the estimation of stresses in flexible pavements.  
b) A homogeneous half space is subjected to a circular load, 254 mm in diameter. The pressure on the circular area is 345 kPa. The half space has an elastic modulus of 69 MPa and a Poisson's ratio of 0.5. Determine the vertical stress at point A, which is located 254 mm below and 508 mm away from the centre. Use appropriate Charts. [8+7]
- 4.a) Why tie bars are used in CC pavement? Write the difficulties during installation of tie bars.  
b) Determine the diameter, spacing, and length of tie bars required for a two lane concrete pavement, 203 mm thick, 18.3 m long and 7.3 m wide with a longitudinal joint at the centre. Take, allowable tensile stress = 200 MPa; allowable bond stress = 2.4 MPa, unit weight of concrete = 25 kN/m<sup>3</sup>, and coefficient of friction = 1.5. [8+7]
5. Discuss how CBR of subgrade is estimated. Differentiate the specifications of standard and heavy compaction to prepare a sample for CBR testing. [15]
- 6.a) What are the materials generally used for water bound macadam.  
b) Discuss the objectives of carrying out bitumen tests and write their advantages and limitations. [7+8]
- 7.a) Explain the considerations for the design of rigid pavements.  
b) Distinguish between "Modulus of Subgrade Reaction" and "Radius of Relative Stiffness". [8+7]
8. What are the design and repair techniques of rural gravel roads? Discuss them as per the IRC considerations. [15]

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