R16

Code No: 138DZ

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech IV Year II Semester Examinations, July - 2023

PAVEMENT DESIGN

(Civil Engineering)

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

Note: i) Question paper consists of Part A, Part B.

ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.

iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART – A

(25 Marks)

1.a)	What are the qualities of good subgrade?	[2]
b)	How do you estimate tyre contact pressure?	[3]
c)	What is transient vibration? When it occurs on road?	[2]
d)	What are the limitations of Westgard's theory?	[3]
e)	Why CBR of subgrade soil is more at 2.5mm penetration?	[2]
f)	Write the functions of geosynthetics.	[3]
g)	When do you prefer flexible pavement?	[2]
h)	What is hot mix asphalt?	[3]
i)	Define is Overlay.	[2]
j)	Write down the advantage of HMA overlay.	[3]

PART – B

(50 Marks)

2. In view of the traffic analysis, explain the following terms: ADT, AADT, Truck Factor, Growth Factor. [10]

OR

3. By drawing the cross-sections of flexible and rigid pavements, discuss the functions of every individual layer placed in these pavements. [10]

4.a) Discuss in detail the stress inducing factors on flexible and rigid pavement.

b) Explain any one of the methods of vibration measurement in the context of vehicle-pavement interaction. [5+5]

OR

5.a) Discuss how do you evaluate curling stresses and frictional stresses in pavements.

b) Explain stresses that are developed in Dowel Bars and Tie Bars. [5+5]

6. What is subgrade modulus? Discuss the evaluation of subgrade modulus using plate load test set up in the field as per the IS code. Also write the significance of subgrade modulus in the pavement design. [10]

OR

7.a) What is rubber modified bitumen? Write its advantages and limitations in pavement construction.

b) Discuss how do you estimate Diametral Resilient and Complex (Dynamic) Moduli of Bituminous Mixes? [5+5]

8. Explain the following mentioning their uses and limitations: (a) Prestresses concrete pavement and (b) reinforced cement concrete pavement. [10]

OR

9.a) What is the difference between mechanistic and empirical pavement design? Discuss the benefits of mechanistic-empirical pavement design method.

b) Explain the concept of Falling Weight Deflectometer and its usefulness in pavement design. [5+5]

10.a) Discuss how do you estimate earth work quantities in rural road construction.

b) What are the modes in which low volume roads fail? Discuss in detail with suitable illustrations. [5+5]

OR

11.a) Discuss what is bonded and unbonded overlay? Write their practical significance.

b) Discuss the pavement evaluation process. [5+5]

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