Printed Pages:02 **Subject Code: NCE-502**

Paper Id: **100502** **Roll No:** | | | | | | | | | | |

B TECH
(SEM V) THEORY EXAMINATION 2018-19
TRANSPORTATION ENGINEERING-I

Time: 3 Hours ***Total Marks: 100***

Notes: *Assume any Missing Data.*

SECTION A

1. Attempt *all* questions in brief. **2×10 = 20**

a. Explain the components of DPR.
b. Explain Road Development Plan: Vision 2021.
c. Why are overtaking zones provided?
d. Why should psychological widening be added to the mechanical widening? Explain.
e. Explain road user characteristics and vehicular characteristics in traffic engineering.
f. Draw a neat sketch of a full cloverleaf and show the movement of traffic.
g. Differentiate Flexible and Rigid pavement.
h. Define the following (i) Flash and Fire point (ii) Flakiness and Elongation index.
i. What do you mean by Dry lean concrete?
j. What are the desirable properties of joint filler material in cement concrete pavements?

SECTION B

2. Attempt any *three* of the following: **10×3=30**

a. A cement concrete pavement has a thickness of 26 cm and lane width of 3.5m. Design the tie bars along the longitudinal joints using the data given below.
Allowable working stress in steel in tie bars = 1250 kg/cm^2

Unit weight of CC= 2400kg/m^3

Maximum value of friction coefficient= 1.2

Allowable tensile stress in deformed tie bar= 2000 kg/cm^2

Allowable bond stress in deformed bars= 24.6 kg/cm^2

b. Write the short notes on
(i) Central Road Research Institute (CRRI)
(ii) Central Road Fund (CRF)
(iii) Highway Research Board (HRB)
(iv) Indian Road Congress (IRC)

c. A national highway passing through rolling terrain in heavy rain fall area has a horizontal curve of radius 500 m. Design the length of transition curve assuming the suitable data.
d. Write the short notes on
(i) Thirtieth highest hourly traffic volume
(ii) Webster's method of signal design
e. Explain the objectives, type of material and method of application of: (i) Prime coat (ii) Tack coat (iii) Seal coat.

SECTION C

3. Attempt any *one* part of the following: 10×1=10

a. Discuss about various surveys to be carried out for the finalization of highway alignment during highway project planning.
b. What are the significant recommendations of Jayakar committee Report? Mention how this helped in road development in India?

4. Attempt any *one* part of the following: 10×1=10

a. Explain camber. What are the objects of providing camber? Discuss the factors on which amount of camber depends. Also show the various shapes of camber with the help of neat sketch.
b. Write the short notes on
   (i) PIEV theory
   (ii) Various types of gradient.

5. Attempt any *one* part of the following: 10×1=10

a. Define: Traffic volume, Traffic density, Time-mean speed, Space-mean speed, Journey speed, running speed, Spot speed.
b. What are the purposes of parking studies? Explain methods of on street parking.

6. Attempt any *one* part of the following: 10×1=10

a. Write the short notes on
   (i) Any four laboratory tests on aggregates
   (ii) Describes the CBR test procedure in lab.
b. What are the different types of joints provided in C.C pavements? How the joints are designed?

7. Attempt any *one* part of the following: 10×1=10

a. What are the possible causes for longitudinal cracking? Explain in detail.
b. Write in brief the step by step procedure of designing the flexible pavement as per IRC: 37-2012. Explain the equipment required for various layers while constructing the flexible pavement.