IAT-1./2019/

Highway Engineering

15CV 63 / 6th semester

Marks

Part A — 20 marks

Q.1. (i) CRRI — Central road research institute was started in the year 1950. — One of the national laboratories of the council of Scientific and Industrial research. 04

(ii) IRC — Indian road congress formed on 1934. Details: works, function etc. 04

(iii) Motor vehicle act: formed on 1939 to regulate laws on traffic. Details. 04

(iv) Highway Research Board: HRB was set up on 1973. objectives: 04

(v) Central road fund: It was formed on 1929. details: 04

Part B

Q.2(a) — (i) 20 year plan (1943–1963) 05

(ii) formulation of road length . . . . . .

(iii) . . . (iv) . . .

2(a) $NH + SH + MDR = \left[\frac{A}{8} + \frac{B}{32} + 1.6N + 8T\right] + D - R$ 05

2(b) (a) Rectangular or block pattern

(b) Radial pattern and block pattern

(c) Radial and circular pattern 05

(d) Radial and grid pattern

(e) Hexagonal pattern (f) Minimum travel pattern.

Q.3

(a) (i) NH = $\frac{80,000}{50}$ km.

(ii) SH

By area = $\frac{80,000}{25}$ km.

By no of towns and area = $\left\{(62.5 \times 86) - \left(\frac{80,000}{50}\right)\right\}$ km. } higher value

(iii) MDR

By area = $\frac{80,000}{12.5}$ km. } higher value

By no of towns = 90 × 86 km

08

(iv) NH + SH + MDR + ODR + VR = $80,000 \times \frac{82}{100}$ km.

ODR + VR = Total road length − (NH + SH + ODR) km

3(b) $SSD = vt + \frac{v^2}{2g(f \pm n\%)} = 132$ m.

07

Q.4 Factors controlling highway alignment are;

i. Obligatory points
ii. Traffic
iii. Geometric design.
iv. Economies
v. Other considerations.

05

Highway cross sectional elements

1. Pavement characteristics — details of components
2. Camber
3. Carriageway
4. Road margin
5. Right of way
6. Kerbs
7. width of roadway

10

USN										

CMRIT

Internal Assessment Test 1 – March 2019

Sub:	HIGHWAY ENGINEERING					Sub Code:	15CV63	Branch:	CIVIL
Date:	06/03/2019	Duration:	90 min's	Max Marks:	50	Sem/Sec:	VI		OBE

PART A is compulsory and answer any TWO questions from Part B

Assume any missing data suitably.

MARKS CO RBT

PART A

1. Write brief notes on contribution of (i) CRRI, (ii) IRC, (iii) Motor vehicle act, (iv) Highway research board and (v) Central road fund on highway development of India. [20] CO1 L1

PART B

2. (a) Describe salient features of Nagpur road plan. How the road length is calculated as per First 20 year road plan. [10] CO1 L2

(b) With neat sketches, explain different road patterns. [05] CO1 L2

3. (a)	Determine the lengths of different categories of roads in a state in India by 2001 plan. The total area of the State is 80,000 sq.km and number of towns as per 1981 census is 86. Calculate the length of primary, secondary and tertiary road network.	[08]	CO1	L3
(b)	Calculate the stopping sight distance on highway at a descending gradient of 2% for a design speed of 80 Kmph. Take reaction time as 2.5 seconds and co-efficient of friction as 0.35.	[07]	CO2	L2
4.	What are the factors controlling Highway alignment? Discuss about highway cross section elements.	[05+10]	CO2	L2

Signature of CI

Signature of CCI

selected

Signature of HOD