Code No: **R31016** **R10** **Set No. 1**

III B.Tech I Semester Supplementary Examinations, May - 2017

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)

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1	a)	Explain the necessity and objectives of highway planning.	[8M]
	b)	Briefly explain the Macadam's method of road construction. Why this method is considered better and more scientific as compared to previous methods.	[7M]
2	a)	Explain curve resistance and compensation in gradient on horizontal curves.	[8M]
	b)	What are the objectives of highway geometric design? List the various geometric elements to be considered while designing a highway.	[7M]
3	a)	A vehicle moving at 45 kmph speed was stopped by applying the brake and the length of skid mark was 12.1 m. If the average skid resistance of the pavement is known to be 0.63, determine the brake efficiency of the test vehicle.	[8M]
	b)	With neat sketches show the various types of traffic signs. Classify them in proper groups.	[7M]
4	a)	Explain the Webster method of designing traffic signals.	[8M]
	b)	At a right angled intersection of two roads, road G has four lanes with a total width of 12.0 m and road H has two lanes with a total width of 7.0 m. The volume of traffic approaching the intersection during design hour are 810 and 709 PCU/hour on the two approaches of road G and 235 and 175 PCU/hour on the two approaches of road H. Design the signal timings as per IRC guidelines.	[7M]
5	a)	Write a note about significance, characteristics and desirable properties of soil as highway material.	[8M]
	b)	What are the desirable properties of bitumen? Compare tar and bitumen.	[7M]
6	a)	Explain how pavement component materials and environmental factors effects pavement design and performance.	[8M]
	b)	Explain the group index method of flexible pavement design.	[7M]
7	a)	Write a note about general design considerations of rigid pavements.	[8M]
	b)	Calculate the spacing of expansion joint from the following data: maximum width of joint = 3 cm, temperature of laying concrete = 24° C, maximum slab temperature expected = 58°C and coefficient of thermal expansion = 10 X 10^{-5} per °C.	[7M]
8	a)	What are the problems in the construction of high embankments over weak foundation soils? How are the various problems addressed?	[8M]
	b)	Enumerate the steps for construction of cement concrete pavement. Draw a neat sketch of the same.	[7M]

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