Total No. of Questions : 10] [Total No. of Printed Pages : 4

Roll No. .....

CE–501(O & N)

B. E. (Fifth Semester) EXAMINATION, June, 2010

(Old and New Scheme)

(Civil Engg. Branch)

TRANSPORTATION ENGINEERING–II

[CE–501(O & N)]

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 35

Note : Attempt *five* questions. Each question has internal choice. Assume suitable data wherever necessary.

1. (a) What are the special considerations while aligning roads on hilly areas ? 10

   (b) A vertical summit curve is formed at the intersection of two gradients + 3·0 and − 5·0 percent. Design the length of summit curve to provide a stopping right distance for a design speed of 75 KMPH. 10

Or

2. (a) Explain how the final location and detailed survey of a highway are carried out. 10

   (b) Calculate the length of transition curve and the shift, using the following data : 10

   Design speed = = 75 KMPH

   Radius of circular curve = 300 M

P. T. O.

Allowable rate of introduction of superelevation (pavement rotated about centre line) = 1 in 150

Pavement width including extra widening = 7·5 m

3. (a) What are the various factors to be considered in pavement design ? Discuss the significance of each. 10

(b) What is CBR method of design ? Discuss the advantages and limitations of this method. 10

Or

4. (a) Discuss the advantages and disadvantages of rigid pavements. 10

(b) (i) Find the radius of relative stiffness and radius of resisting section for a concrete slab from the following data : 5

Modulus of elasticity of concrete	$= 3 \cdot 1 \times 10^5$ kg/cm^2
Poisson's ratio of concrete	$= 0 \cdot 15$
Modulus of subgrade reaction	$= 6 \cdot 0$ kg/cm^3
Thickness of slab	= 22 cm
Radius of loaded area	= 16 cm

(ii) Discuss the design of dowel bars 5

5. (a) What is mechanical stabilization ? Discuss the properties of soil aggregate mixures and the factors affecting the properties of mechanical stabilized soil. 10

(b) What are the various types of failures in flexible pavements ? Explain the causes. 10

Or

6. (a) Explain the desirable properties of aggregates to be used in different types of pavement construction. 10

   (b) What is a traffic rotary ? What are its advantages and limitations, in particular reference to traffic conditions in India ? 10

7. (a) What are the basic patterns of runway configuration ? Discuss each pattern. 10

   (b) The following is the average wind data for 10 years. Draw Type-II wind rose diagram and determine the wind coverage along N-S direction. The permissible cross wind component is 25 KMPH :

Direction	% time with wind velocity in KMPH		
	6·4 – 25	25 – 50	50 – 75
N	1·30	1·30	0·10
NNE	5·50	5·0	0·10
NE	8·0	7·60	0·20
EEN	3·10	2·20	0·10
E	0·60	0·50	0·00
EES	1·70	0·80	0·10
SE	3·90	2·00	0·20
SSE	1·50	0·50	0·10
SSW	5·20	4·10	0·10
SW	5·20	4·50	0·10
WWS	7·60	6·50	0·20
W	2·60	1·60	0·10
WWN	2·50	0·60	0·00
NW	2·50	1·50	0·10
NNW	1·50	1·50	0·00

Or

8. (a) What are the imaginary surfaces ? What is their significance ? Explain with neat sketches the shape of each surface for different types of airports ? 10

   (b) Explain various factors affecting airport capacity. 10

9. (a) Write notes on the following : 10

(i) Beacon light

(ii) Runway threshold lighting

(iii) Apron hanger lighting

(b) Explain the network of Air Traffic Control. 10

Or

10. (a) Explain with the help of neat sketches the shape of approach and inner horizontal surfaces. 10

(b) Illustrate with suitable sketches the markings on runways. 10

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