

BENGAL ENGINEERING AND SCIENCE UNIVERSITY, SHIBPUR
B.E. (Civil) 5th Semester Final Examination 2012-2013

Transportation Engineering- I (CE-505)

Time: 3 Hours.

Full Marks: 70

*Use separate answer script for each half
Assume data reasonably if required*

FIRST HALF

Attempt Q.No.1 and any TWO from the rest

1. Write short notes on (Any three) [3x5=15]
- Necessity of the drainage system in urban and rural area
 - CBR and its role on the design of flexible pavement
 - Essentiality of using camber in the roadway pavement with recommended range as per IRC.
 - Port, harbour and dock
 - Rubblemound breakwater
2. a) State with neat sketch the different types of pavement distress resulting from repeated application of traffic loads are to be considered in the performance-based analytical design approach for flexible pavements, as recommended in the IRC:37-2001.
- b) The traffic volume survey conducted for dual carriageway with three lanes 3 years ago recorded 5400 CVPD in each direction. Design the pavement for the following data:
- DATA**
- | | | |
|-------|-----------------------------|------------|
| (i) | Design life | = 15 years |
| (ii) | Design CBR of subgrade soil | = 5.0% |
| (iii) | Traffic growth rate | = 7.5% |
| (iv) | Vehicle damage factor | = 4.5 |
- [2+8]
3. a) What are the benefits derived from floating dock? Give a neat sketch showing a section of a floating dock
- b) State the difference between the slipway and marine railway dock
- c) On a slipway the largest vessel to be slipped is 55m long with a draft of 3.5m. The height of the cradle block from the slipway deck is 0.80m and the angle with the horizontal plane is 4.45°. If the total clearance of 4.0m is allowed for miscellaneous purposes then what will be the total length of the slipway. Also find out the pull required to pull the vessel on dry land if the weight of the vessel are 55 tones and 6 tones respectively. [(2+2)+2+4]
4. a) State the guiding principles of port planning.
- b) What is meant by graving dock? What are the main components of a graving dock? Explain briefly the different types of graving docks.
- c) Discuss the vital role of port in building up the economy of a country. [2+ (1+2+3) +2]

P.T.O.

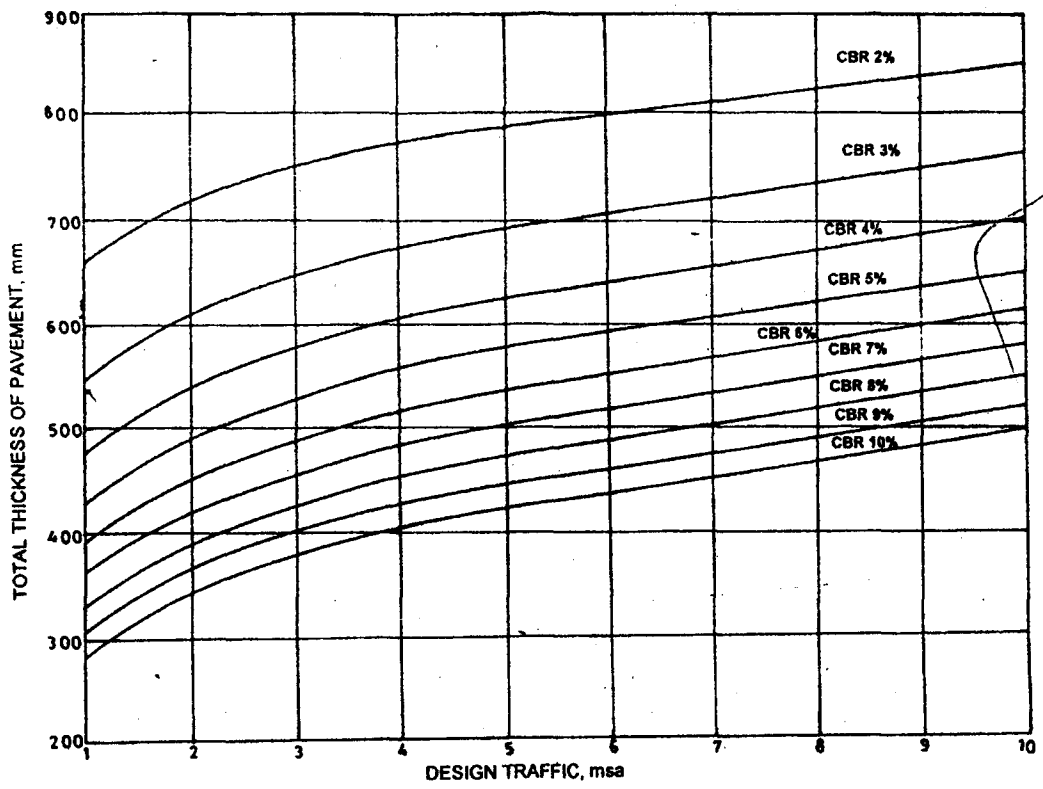


Fig. 1. Pavement Thickness Design Chart for Traffic 1-10 msa

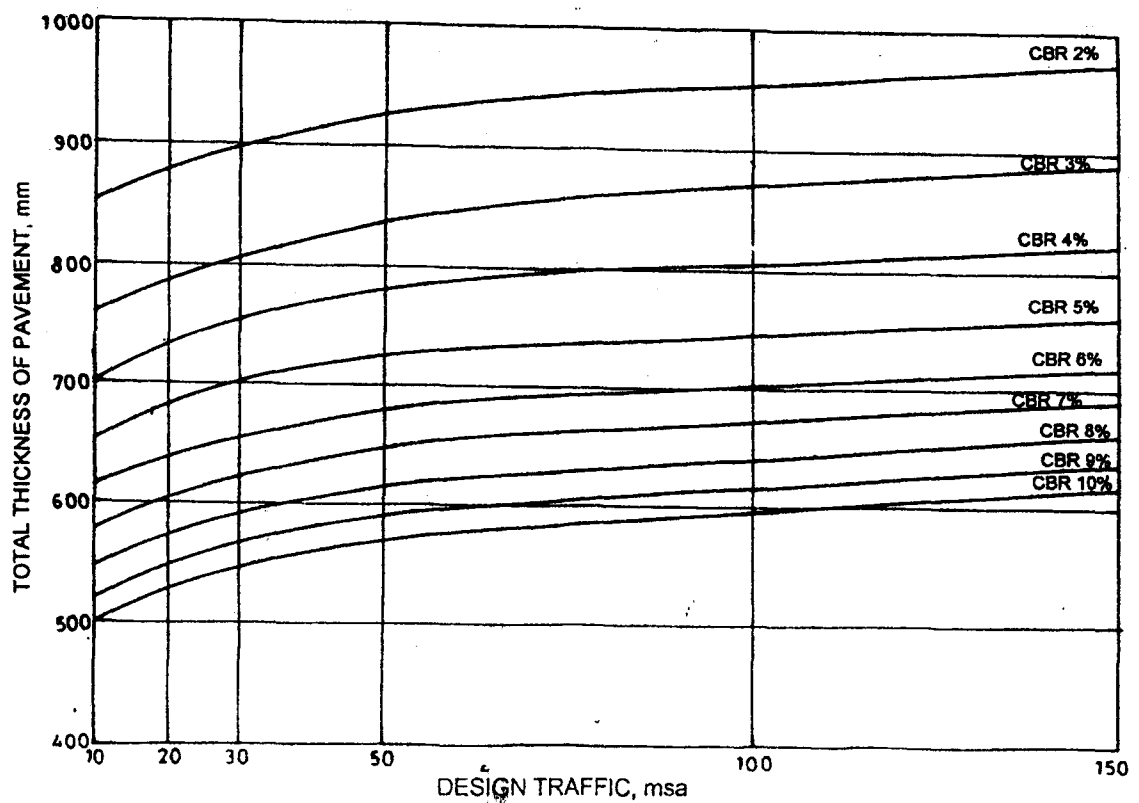


Fig. 2. Pavement Thickness Design Chart for Traffic 10-150 msa

PAVEMENT DESIGN CATALOGUE

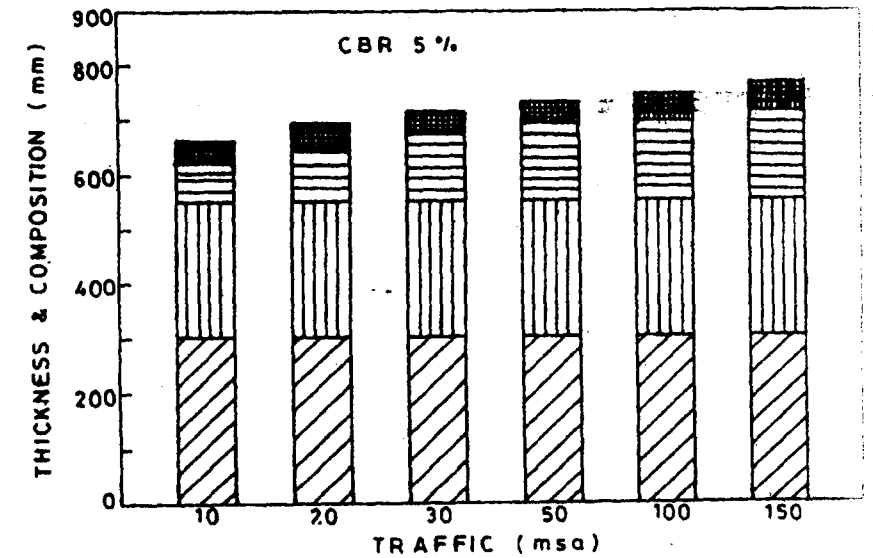
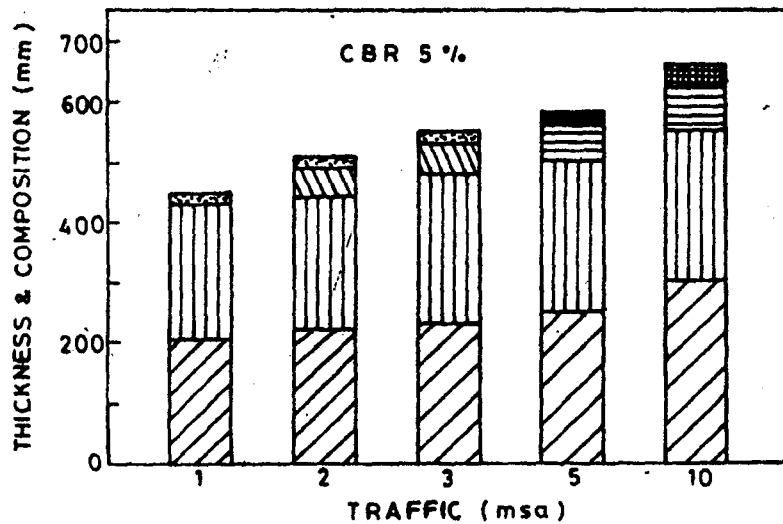
PAVEMENT DESIGN CATALOGUE

PLATE 1 - RECOMMENDED DESIGNS FOR TRAFFIC RANGE 1-10 msa

PLATE 2 - RECOMMENDED DESIGNS FOR TRAFFIC RANGE 10-150 msa

CBR 5%					
Cumulative Traffic (msa)	Total Pavement Thickness (mm)	PAVEMENT COMPOSITION			
		Bituminous Surfacing		Granular Base (mm)	Granular Sub-base (mm)
		Wearing Course (mm)	Binder Course (mm)		
1	430	20 PC		225	205
2	490	20 PC	50 BM	225	215
3	530	20 PC	50 BM	250	230
5	580	25 SDBC	55 DBM	250	250
10	660	40 BC	70 DBM	250	300

CBR 5%				
Cumulative Traffic (msa)	Total Pavement Thickness (mm)	PAVEMENT COMPOSITION		
		Bituminous Surfacing		Granular Base & Sub-base (mm)
		BC (mm)	DBM (mm)	
10	660	40	70	Base = 250
20	690	40	100	
30	710	40	120	
50	730	40	140	Sub-base = 300
100	750	50	150	
150	770	50	170	



GSB
 GB
 DBM
 BM
 BC
 SDBC
 PC

GSB
 GB
 DBM
 BC

Contd.

Contd.