Course No: CE G549   **Date: 07-12-2016**

Duration: 180 Mins (Closed book)   **Max. Marks: 70**

Part 1 [1 marks]

1. 1 crore investment in roads would lift approximately ……. Persons.
2. Usually soaked CBR is used for evaluating the strength of subgrade. When is soaked CBR not required?
3. What is the height of object considered for ISD?
4. The cross slope for mountainous terrain is ……….
5. Define an unconnected habitation (as per the guidelines of PMGSY).
6. The logo of PMGSY is _____
7. The unit for the protection work is _____
8. Tack coat, PMC, Seal coat, Primer coat. Arrange in the order of construction (top to bottom).
9. The gap graded material is superior to well graded material for better drainage (True/False)
10. The low volume roads will have _____ CVPD as per IRC SP-72.

Part 2 [2 marks]

1. How super-elevation has to be achieved in absence of transition curve?
2. What are catch water drains? Draw a typical catch water drain.
3. What is the usual cost associated with the preparation of DPR? What is the usual way of reporting the cost?
4. What is meant by marginal materials? Can it be used for the construction directly?
5. Why do you think is Reclaimed Asphalt Pavement (RAP) required?

Part 3 [Long Questions]

1. Briefly explain the steps involved in planning of the core network of rural roads in India. What are the different shapes which could be adopted for the road surface drains? Which according to you is the best among all. Justify your answer. Draw three typical surface drains.   **(4+2+2+2)**

2. List down different type of distresses in flexible and rigid pavements (separately). Briefly explain the reason behind the occurrence of the distress, their effect on the performance of the pavement and the corresponding remedies.   **(10)**

3. Blend the aggregates A, B and C using Triangulation method   **(15)**

Sieve size (mm)	Aggregates			Specifications	Median of Specifications
	A	B	C		
25	100	100	100	94 to 100	97
12.5	63	100	100	70 to 85	78
4.75	19	100	100	40 to 55	48
2.36	8	93	100	30 to 42	36
0.6	5	55	100	20 to 30	25

0.15	3	36	97	12 to 22	17
0.075	2	3	88	5 to 11	8

4. Derive the expression for radius of equivalent circular contact area for the dual tyre configuration in terms of S_d, load (P_d) and tyre pressure (q). **(10)**
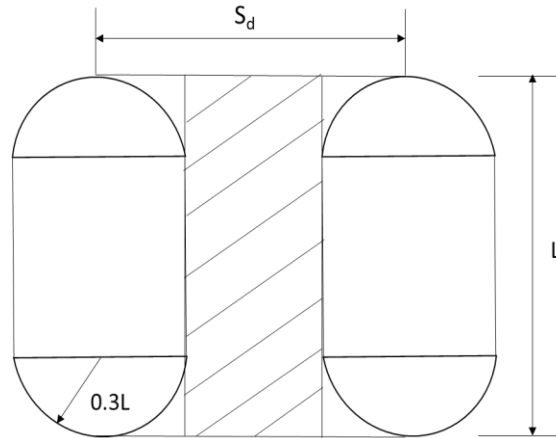
5. What is the general criterion for the fully bonded condition? What is the advantage of using rubble in the base course of the flexible pavement? Mention the characteristics of Black Cotton Soil. If you are an engineer in-charge of construction site at Cherrapunji, will you recommend this soil? What are the innovative ways to improve the drainage characteristics of the pavement? **(1+1+2+1)**