

GUJARAT TECHNOLOGICAL UNIVERSITY
M. E. - SEMESTER – I • EXAMINATION – WINTER • 2013

Subject code: 711903N**Date: 03-01-2014****Subject Name: Highway Materials & Testing****Time: 10.30 am – 01.00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full mark.

Q.1 (a) Define the following: **07**

Flash point of bitumen, dense graded aggregate, full depth asphalt, hot mix asphalt, seal coat, sheet asphalt, ambient grinding.

(b) Under the influence of which external factors the hardening of bitumen takes place. Explain in detail. **07**

Q.2 (a) Which are the tests conducted on bitumen. Explain the procedure of conducting penetration test on bitumen. **07**

(b) Define viscosity, its type and discuss different grades of viscosity grade bitumen as per IS 73:2006. **07**

OR

(b) State the advantages of viscosity grade bitumen as per IS 73:2006. **07**

Q.3 (a) The specific gravities and weight proportions for aggregate and bitumen are as under for the preparation of marshall mix design. The volume and weight of one marshall specimen was found to be 475 cc and 1100 gm. Assuming absorption of bitumen in aggregate as zero, find V_v , V_b , V_{ma} and V_{fb} . **07**

Item	A.1	A.2	A.3	A.4	B
Wt (gm)	825	1200	325	150	100
Sp. Gr.	2.63	2.51	2.46	2.43	1.05

(b) State how the problem of stripping can be effectively minimized using DERBO range of anti stripping agent. What are the other benefits of DERBO range. **07**

OR

Q.3 (a) Define elastic recovery of bitumen. State the procedure of preparation of sample for testing. **07**

(b) Define rheology of bitumen. Explain briefly its chemical group. **07**

Q.4 (a) What do you mean by aggregate blending? Explain briefly triangular chart method of aggregate blending. **07**

(b) State the range of parameter for SFRC commonly encountered in practice. **07**

OR

Q.4 (a) Explain briefly the drawbacks of road note no. 4 method. **07**

(b) State the features and benefits with uses of asphalt crack filler. **07**

Q.5 (a) Write a short note on stress absorbing membrane using rubber modified bitumen. **07**

(b) What is the need of concrete mix design? What is DLC. Write advantages of it. **07**

OR

Q.5 (a) Enlist the classification of modifiers and their optimum dose level **07**

(b) Explain hubbard method of bituminous mix testing. **07**
