Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. IST Semester–Remedial Examination – July- 2011

Subject code: 711903N

Subject Name: Highway Materials & Testing

Date:11/07/2011 **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 marks.**

Q.1 **(a)** Define pitches, prime coat, slurry seal, coke-oven tar, refined tar, clinker and straight run pitch, **07**

(b) Explain anionic and cationic bitumen road emulsions with their uses. **07**

Q.2 **(a)** Explain benefits of Derbo range anti-stripping agent for minimizing water damage to bituminous pavements and state the optimum doses of commercial grades. **07**

(b) Explain briefly the classification of meltenes in details. **07**

OR

(b) State the objectives of any seven tests conducted in highway material laboratory. **07**

Q.3 **(a)** State the requirements of polymer modified 70 grade binder with respect to the method of IS test. **07**

(b) Write a short note on Marshall method of Bituminous mix design. **07**

OR

Q.3 **(a)** State the properties improved by the addition of polymer to bitumen. State any three types of polymers and dosage requirement in total mix of it. **07**

(b) 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 is zero, find Vv, Vb, VMA and VFB: **07**

Item	A.1	A.2	A.3	A.4	A.5
Wt (gm)	825	1200	325	150	100
Sp. Gr.	2.63	2.51	2.46	2.43	1.05

Q.4 **(a)** State the physical properties of various types of fibres for concrete roads. **07**

(b) Write a short note on dry lean concrete mix. **07**

OR

Q.4 **(a)** State the benefits of hardened steel fibre reinforced concrete. **07**

(b) Explain the importance of aggregate grading requirements and proportioning. **07**

Q.5 **(a)** State the design criteria by Hveem method of bituminous mix. **07**

(b) State the important traffic parameters in detail considered in IRC concrete mix design (IRC-58). **07**

OR

Q.5 **(a)** State the design criteria by modified Hubbard-Field method of bituminous mix. **07**

(b) Write a short note on road note no. 4. **07**

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