

**PARUL UNIVERSITY**  
**FACULTY OF ENGINEERING & TECHNOLOGY**  
**M.Tech. Summer 2018 - 19 Examination**

**Semester: 1**  
**Subject Code: 203211102**  
**Subject Name: Highway Materials and Construction**

**Date: 30/4/2019**  
**Time: 10:30 am To 1:00 pm**  
**Total Marks: 60**

**Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

- Q.1** A) What are the main differences between soil compaction and consolidation process. (05)  
 B) Write a difference between Tar & Bitumen. (05)  
 C) What do you mean by soil stabilization? What are the need for soil stabilization? (05)
- Q.2** Answer the following questions. (Attempt any three) (Each five mark) (15)  
 A) Explain in detail any one test on Aggregate.  
 B) What are the methods of soil stabilization? Explain one in brief.  
 C) Write a short note on surface drainage.  
 D) What are the equipment's and plants used in road construction? Also write their uses.
- Q.3** A) Explain procedure of blending of aggregate. (07)  
 B) Explain in detail mix designs for Bituminous concrete. (08)
- OR**
- B) Write a short note on High performance concrete. (08)
- Q.4** A) What is the construction procedure & quality control test for BC? (07)
- OR**
- A) What is WBM? What are the materials used in WBM, Explain in Detail. (07)  
 B) A trial mix of surface course of N.H. which carries heavy traffic is designed by Marshall Mix design, average test results obtained are as under. (08)

Bitumen Content	Stability in kg	Flow in mm	CDM gm/cc
4	902	1.23	2.5
4.5	1015	1.65	2.511
5	1106	2.31	2.519
5.5	1098	3.28	2.517
6	961	5.10	2.509

Determine OBC to satisfy Marshall design criteria. Discuss necessary adjustments of trial does not satisfy the following criteria. Assume SGMA = 2.810 & Gb = 1.02

1. Stability = 820 kg (min req)
2. Flow = 2-4 mm
3. VMA = 10-12%
4. VIM = 3-5%
5. VFB = 65-78%