King Fahd University of Petroleum & Minerals
جامعة الملك فهد للبترول و المعادن

Pavement Materials

1. Define *aggregates*.
2. What materials are used in aggregates, and what are the main sources?
3. What is meant by coarse aggregate, fines, crushed gravel, crushed rock, and concrete sand?
4. What is the nominal maximum size for fine aggregate? What is the actual maximum size usually specified?
5. Results of a sieve analysis on an aggregate are

Pass 50 mm	100%
Pass 37.5 mm	93.8%
Pass 25 mm	47.1%
Pass 19 mm	6.1%
Pass 9.5 mm	1.8%

What is (a) the nominal maximum size, (b) the nominal size range, and (c) the term used to describe this size aggregate.

6. What size restrictions would you expect to find in the specifications for a 9.5-4.75 mm aggregate? Would this be a coarse or a fine aggregate?
7. Why is gradation of aggregates important?
8. What is the purpose of a washed test?
9. Give two reasons why excessive amounts of fines may be undesirable in aggregates.
10. Name three types of waste or recycled materials that are used as aggregates.
11. What type of gradation curve is desirable for an aggregate to be used as a highway base course? Why?
12. Following are results of a washed sieve analysis:

Original mass	= 608.5 g
Dry mass after washing	= 578.2 g

Sieve test:

Sieve	*Mass Retained*
9.5 mm (3/8 in.)	0.0 g
4.75 mm (No. 4)	96.2 g
2.36 mm (No. 8)	117.1 g
1.18 mm (No. 16)	128.8 g
600 μm (No. 30)	105.3 g
300 μm (No. 50)	82.7 g
150 μm (No. 100)	29.3 g
75 μm (No. 200)	14.7 g
Pan	2.7 g

Complete the grain-size distribution calculations and draw the grain-size distribution curve.

13. Write a one-to- two-page report on the Aggregates laboratory tests as conducted in the laboratory visit.