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No.: _____

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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
THIRD SEMESTER B.TECH DEGREE EXAMINATION(S), MAY 2019

Course Code: CH203

Course Name: PARTICLE TECHNOLOGY

Max. Marks: 100

Duration: 3 Hours

PART A

Answer any two full questions, each carries 15 marks.

Marks

- 1 a) What is subsieve analysis? Explain any one of the subsieve analysis in detail. (8)
- b) A particulate material has a density of 1.3 g/cc and sphericity of 0.6. The size analysis is as follows. Find the specific surface area and sauter diameter of the clay material. (7)

Average dia (cm)	0.0252	0.0178	0.0126	0.0089	0.0038
Mass fraction (g/g)	0.088	0.178	0.293	0.194	0.247

- 2 a) Explain batch sedimentation test (8)
- b) What is the working of a rake classifier with figure? (7)
- 3 a) Discuss the methods to represent particle size in a mixture. (8)
- b) How the particle separation takes place by jigging? (7)

PART B

Answer any two full questions, each carries 15 marks.

- 4 a) A sludge filtered in a washing plate and frame filter press is of such nature that the filtration equation is $V^2 = Kt$ where V is the volume of filtrate obtained in time t, when pressure is constant, 40 m³ of filtrate is produced in 10 hours. 3.5 m³ of wash water is forced through the cake at the end of filtration. What is the length of the washing time? (8)
- b) What is the working of a venturi scrubber? (7)
- 5 a) Discuss the working of any pressure filter equipment. (8)
- b) Explain with figure the working of a simple design and low economical gas solid separation technique? (7)
- 6 a) What are the factors affecting rate of filtration and specifications of a filter media? (8)
- b) Write the advantages, disadvantages and application of electrostatic precipitator. (7)

PART C

Answer any two full questions, each carries 20 marks.

- 7 a) In a ball mill of 2500 mm diameter, 150 mm diameter steel balls are used for grinding. The mill runs at 15 rpm. At what speed will the mill have to run if the 150 mm balls are replaced by 50 mm balls, all other conditions remaining the same? (10)
- b) What are the methods and factors considered for the selection of a size reduction equipment? (10)
- 8 a) How are the bulk solid stored and problems associated with bulk solid flow? (10)
- b) Explain the working of a V-Blender. (10)
- 9 a) For the preparation of soup powder, a mixture of dry vegetables and starch in a proportion of 30:70 is put to a batch mixer for blending. After 5 min the variance of the sample compositions measured in terms of fractional composition was 0.06. How long the mixing continue so as to reach specified maximum sample composition variance for a 25 particle sample 0.025? Assume the size of starch and dried vegetables to be almost equal. (10)
- b) Which crusher is used widely in crushing rocks, construction materials etc. (10) Explain its working with figure.
