

GUJARAT TECHNOLOGICAL UNIVERSITY**BE – SEMESTER- V EXAMINATION-SUMMER 2023****Subject Code: 3150505****Date: 27/06/2023****Subject Name: Particle and Fluid Particle Processing****Time: 02:30 PM TO 05:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

MARKS

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| Q.1 | (a) State the purposes of agitation of liquid in chemical industries. | 03 |
| | (b) Explain Sink and float method for classification of solids. | 04 |
| | (c) Describe construction and working of mixer used for non-cohesive Solid. | 07 |
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| Q.2 | (a) Give classification of various types of impellers used for mixing and agitation of liquid. | 03 |
| | (b) Write short note on storage devices of solids. | 04 |
| | (c) Describe construction and working of belt conveying system. | 07 |
| | OR | |
| | (c) Explain the scale up of the agitated vessel. | 07 |
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| Q.3 | (a) List out different application of fluidization. | 03 |
| | (b) Write a brief note on conditions for fluidization with neat sketch. | 04 |
| | (c) Describe types of fluidization in detail. | 07 |
| | OR | |
| Q.3 | (a) Write a brief note on batch sedimentation. | 03 |
| | (b) Differentiate between compressible cake and incompressible cake. | 04 |
| | (c) Discuss Kynch theory for design of continuous thickener. | 07 |
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| Q.4 | (a) Define: (i) critical moisture content (ii) magma (iii) mesh number. | 03 |
| | (b) Outline the various purpose of agitation of liquids in chemical engineering. | 04 |
| | (c) Explain construction and working Swenson walker crystallizer with a neat sketch. | 07 |
| | OR | |
| Q.4 | (a) Outline the significance of Power number, Reynolds number and Froude number for mixing of liquids. | 03 |
| | (b) Define separation factor for cyclone. List out factors affecting the performance of the cyclone. | 04 |
| | (c) Explain construction and working of fluidized bed reactor. | 07 |
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| Q.5 | (a) Write brief not on homogeneous nucleation. | 03 |
| | (b) What are purposes of draft tube in agitated vessel? | 04 |
| | (c) Discuss construction and working of helical element static mixture. | 07 |
| | OR | |
| Q.5 | (a) Give two purposes of screen analysis. | 03 |
| | (b) What is function of filter aids? State four examples of filter aids. | 04 |
| | (c) Explain working of tray dryer for solids with neat sketch. | 07 |
