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Question Paper Code: 94904

B.E./B.Tech. DEGREE EXAMINATION, MAY 2022

Fourth Semester

Chemical Engineering

19UCH404 – Mechanical Operations

(Regulations 2019)

Duration: Three hours

Maximum: 100 Marks

PART A - (10 x 1 = 10 Marks)

- Which of the following gives the total surface area of the particle? CO1- R
(a) $N \cdot S_p$ (b) $V_p \cdot S_p$ (c) S_p/D_p (d) S_p/V_p
- The two basic methods of analysis are _____ CO1- R
(a) Cumulative and Affirmative (b) Cumulative and Frequency
(c) Frequency and Affirmative (d) Affirmative and Conservative
- As the rate of feed increases, the size reduction _____ CO2- R
(a) Increases (b) Remains constant (c) Equals (d) Decreases
- Which of the following is NOT a method used for size reduction? CO2- R
(a) Cutting (b) Impact (c) Burning (d) Shear
- Separation of a solid from suspension in liquid by screen means is called as CO3- R
(a) Sedimentation (b) Extraction (c) Distillation (d) Leaching
- When impurities are separated by the gravitation of settling particles, the operation is called _____ CO3- R
(a) Sedimentation with coagulant (b) Plain sedimentation
(c) Secondary sedimentation (d) Disinfection
- Which of the following does not influence filtration? CO4- R
(a) Temperature (b) Density (c) Viscosity (d) pH

8. The specific cake resistance for compressible sludge, is a function of the pressure drop _____ CO4- R
 (a) Over cake (b) Over medium (c) overall (d) Rate
9. For exothermic reactions, which setup is best suited for an agitated vessel? CO5- R
 (a) Full conventional jacket (b) Dimpled jacket
 (c) Full helical coils (d) Half-pipe jacket
10. What is the distance at which belt conveyors can convey? CO4- R
 (a) 100m (b) 200m (c) 50m (d) 500m

PART – B (5x 2= 10 Marks)

11. What is the shape of a particle? CO1- R
12. What are the advantages of size reduction? CO2- R
13. What is screen effectiveness? CO3- R
14. What equipment is used in filtration? CO4- R
15. What are the types of impeller? CO5- U

PART C - (5 x 16 = 80 Marks)

16. (a) Discuss about their behavior under different external forces. CO1 -U (16)
 Or
 (b) Explain detail about the Agglomeration. CO1 -U (16)
17. (a) Discuss briefly about the Mechanical Efficiency. CO2 -U (16)
 Or
 (b) Discuss briefly about the Cutting Machines CO2 -U (16)
18. (a) Explain briefly about the gravity settling . CO3-U (16)
 Or
 (b) Derive the material balance over the screen and find out the effectiveness factor. CO3-U (16)
19. (a) Explain briefly about the Specific Cake Resistance CO1 -U (16)
 Or
 (b) Explain briefly about bio filtration. CO4 -U (16)
20. (a) Explain briefly about the agitation. CO5- U (16)
 Or
 (b) Explain briefly about the Pneumatic conveyor. CO5- U (16)

