

(b) The separation of toluene and iso-octane is difficult. But in the presence of phenol it becomes easier. This practice of distillation is called

- (i) Azeotropic distillation
- (ii) Extractive distillation
- (iii) Destructive distillation
- (iv) Fractional distillation

(c) Which one of the following is used in wet granulation process?

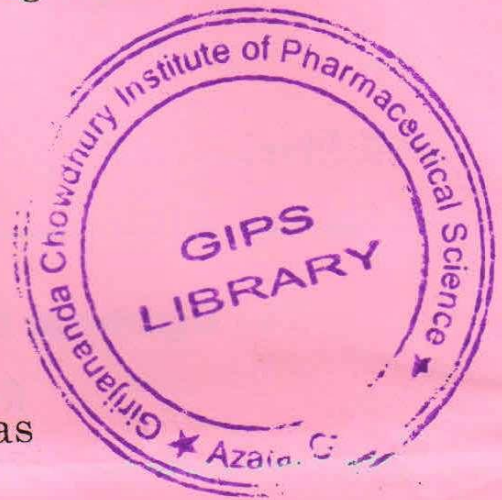
- (i) Ribbon blender
- (ii) V cone blender
- (iii) Double cone blender
- (iv) Sigma blade mixer

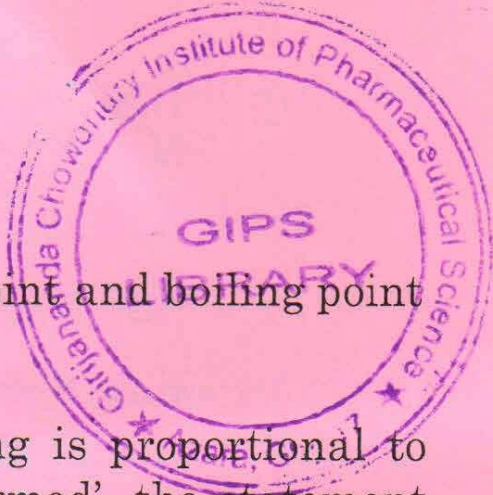
(d) Micromixing is referred to as

- (i) Shear mixing
- (ii) Geometric mixing
- (iii) Diffusive mixing
- (iv) Convective mixing

(e) The amount of heat flow through a body by conduction is

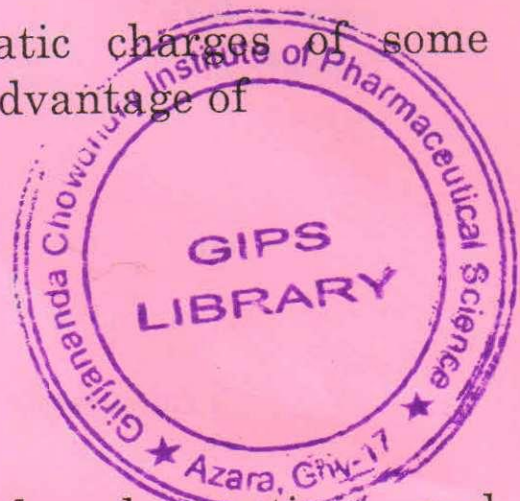
- (i) Directly proportional to the temperature difference
- (ii) Dependent upon the material of the body
- (iii) Inversely proportional to the thickness of the body
- (iv) All of the above



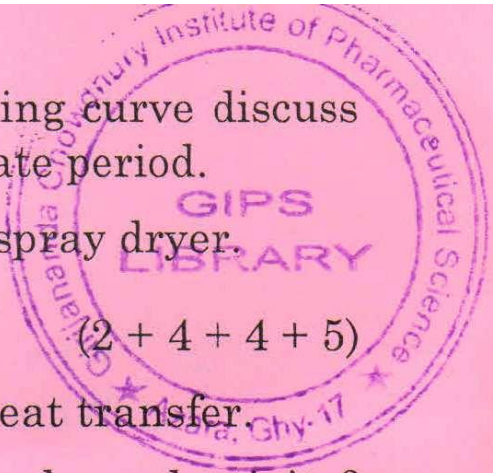
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- (f) Evaporation takes place at
- (i) freezing point
 - (ii) boiling point
 - (iii) in between freezing point and boiling point
 - (iv) at all temperatures
- (g) 'The useful work in milling is proportional to the length of new crack formed'- the statement comes from-
- (i) Bonds's theory
 - (ii) Griffin's theory
 - (iii) Kicks theory
 - (iv) Rittinger's theory
- (h) Young's modulus expresses the
- (i) Moisture content of material
 - (ii) Heat content of material
 - (iii) Stiffness or softness of material
 - (iv) Fragility or brittleness of material
- (i) Choose the correct statement for moderately fine powder-
- (i) A powder all the particle of which pass through #85 and not more than 40% through #44
 - (ii) A powder all the particle of which pass through #22 and not more than 40% through #60
 - (iii) A powder all the particle of which pass through #85 and not more than 40% through #60
 - (iv) A powder all the particle of which pass through #44 and not more than 40% through #85

(j) Developing of electrostatic charges of some organic powders is a disadvantage of

- (i) Fluidized bed dryer
- (ii) Vacuum dryer
- (iii) Spray dryer
- (iv) Lyophilizer



2. (a) What are differential, destructive and extractive distillation? (3 + 4 + 4 + 4)
- (b) Write the working principle of flash distillation. What are its advantages, disadvantages and application?
- (c) Give the statements of Raoult's law. Define ideal and real solution. How positive and negative deviation takes place from Raoult's law?
- (d) Write a note on preparation of water for injection IP.
3. (a) What is mixing index? Give the mechanisms of mixing. (3 + 4 + 4 + 4)
- (b) State with example the statistical parameters applicable to mixing process.
- (c) What are the reasons of vortex formation? How vortex formation can be prevented?
- (d) With a labeled diagram explain the working of a planetary mixer.
4. (a) Differentiate bound and unbound water. What are EMC and FMC? (3 + 4 + 4 + 4)
- (b) Explain the principle of freeze drying and processing of sample for freeze drying.



- (c) With the help of a rate of drying curve discuss the constant rate and falling rate period.
- (d) Describe the construction of a spray dryer.
5. (a) What are gray bodies? (2 + 4 + 4 + 5)
- (b) Describe the Fourier's law of heat transfer.
- (c) What is coefficient of thermal conductivity? Derive an equation of conduction of heat through a circular pipe.
- (d) Explain the working principle and construction of a heat interchanger.
6. (a) What do you mean by evaporator capacity? (2 + 3 + 5 + 5)
- (b) Why there is scale formation during evaporation of some substances. Suggest measures for decreasing the scale formation.
- (c) Explain the principle of agitated film evaporator with a neat diagram. Write its applications.
- (d) Discuss the importance of evaporation under reduced pressure. Describe one such equipment.
7. (a) Enlist the factors which affect the degree of size reduction. (2 + 3 + 5 + 5)
- (b) Write the explanation Griffin's theory of size reduction.
- (c) Explain the laws governing energy requirement in size reduction.
- (d) Describe hammer mill with its working principle, construction, advantages and disadvantages.

8. (a) What are the impacts of thermal pollution?
How thermal pollution can be controlled?
- (b) Discuss the methods of cleaning up the waste water effluent.
- (c) What levels of noise is considered unhealthy?
What are the sources of noise pollution and how can be minimized? (5 + 5 + 5)
9. (a) How oscillatory, vibratory and gyratory motions differ from each others? (5 + 5 + 5)
- (b) Give details about the various specifications of standard sieves as per IP.
- (c) Explain the principle and working of a cyclone separator with its applications.
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