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PY 132403

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2019

B.Pharm. 4th Semester End-Term Examination

**BASIC ENGINEERING – II
(UNIT OPERATIONS – II)**

(Old Regulation)

Full Marks – 100

Time – Three hours

The figures in the margin indicate full marks
for the questions.

Answer Question No. 1 is compulsory. Attempt any *six*
question from the rest.

1. Multiple choice questions. Answer *all* the questions.
(10 × 1 = 10)
- (i) Fractional distillation is a process of separation
of
- (a) 2 miscible liquids
 - (b) 2 immiscible liquids
 - (c) none of (a) and (b)
 - (d) both (a) and (b)

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- (ii) The best distillation method for the purification and separation of chemicals of low vapour pressure is
- (a) Fractional distillation
 - (b) Molecular distillation
 - (c) Azeotropic distillation
 - (d) Extractive distillation
- (iii) Tumbler blenders are not recommended for the mixing of
- (a) Fragile material
 - (b) Free flowing material
 - (c) Coarse powder with low differences in the particle size distribution
 - (d) Fine powder with large differences in the particle size distribution
- (iv) When the emissivity of non-black surface is constant at all temperatures and throughout the entire range of wavelength, the surface is called
- (a) Gray body
 - (b) Transparent body
 - (c) Opaque bodies
 - (d) Perfect black body
- (v) Which one of the following statement is not true for mixing index (M)
- (a) M should be greater than 1
 - (b) The higher the M value the greater the homogeneity
 - (c) M is a ratio of $\pm SD$ of random blend to $\pm SD$ of sample blend
 - (d) M always has a value of less than 1

- (vi) Which one of the following is used in wet granulation process
- (a) Ribbon blender
 - (b) V cone blender
 - (c) Double cone blender
 - (d) Sigma blade mixer
- (vii) Young's modulus expresses the
- (a) Moisture content of material
 - (b) Heat content of material
 - (c) Stiffness or softness of material
 - (d) Fragility or brittleness of material
- (viii) Elutriation is a process of
- (a) Size reduction using mechanical forces
 - (b) Size separation using a moving fluid
 - (c) Size reduction using electrical repelling forces
 - (d) Size separation using surface charges of the fine particles
- (ix) Developing of electrostatic charges of some organic powders is disadvantage of
- (a) Fluidized bed dryer
 - (b) Vacuum dryer
 - (c) Spray dryer
 - (d) Lyophilizer

- (x) Unit of rate of heat transfer is
- (a) Joule (b) Newton
- (c) Pascal (d) Watt
2. (a) Classifies distillation processes. What are the essential equipments for distillation? (5+5+5)
- (b) Write the working principle of steam distillation.
- (c) Explain the separation of azeotropic mixtures.
3. (a) What are the pharmaceutical application of mixing? (4+3+4+4)
- (b) What is ordered mixing?
- (c) What are the mechanisms of solid mixing and liquid mixing?
- (d) With a labeled diagram explain the working of a sigma blade mixer.
4. (a) What are EMC and FMC? (3+4+4+4)
- (b) Explain the principle of vacuum drying
- (c) Explain the events of drying rate curve.
- (d) Describe the construction of a fluidized bed dryer..

5. (a) What are black bodies? (1+4+5+5)
- (b) Describe the principle of film coefficient and how it affects heat transfer.
- (c) Discuss parallel and counter current heat flow.
- (d) Explain the working principle and construction of a heat exchanger.
6. (a) Classify evaporation equipments.
- (b) What are the factors those affect evaporation?
- (c) Explain the principle of falling Film evaporator.
- (d) Explain the construction of multiple effect evaporator.
7. (a) Give the applications of size reduction. (3+4+4+4)
- (b) Write the note on bonds work index.
- (c) Explain the laws governing energy requirement in size reduction.
- (d) Describe ball mill with its working principle and uses.
8. (a) What are the impacts of air pollution? How air pollution can be controlled? (5+5+5)
- (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?

9. (a) Explain the process of size separation by sedimentation. (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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