03/1/22 m

Instructions to Candidates: *No supplementary/continuation sheet will be issued to the candidates. Answer the questions precisely.*
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***Section B consists of Three questions carrying 10 marks each (Long Answer); attempt any **TWO**.*
*** Section C consists of Nine questions carrying 5 marks each (Short Answer); attempt any **SEVEN**.*

Section A
(10 X2 = 20)

1. Give very short answers to the followings (2 marks each):

i.	What are Eddies? What is its role in loss of fluid velocity?
ii.	Define Vulcanization.
iii.	Distinguish between Distillation and Evaporation.
iv.	Define Desorption.
v.	How size reduction carried out for fibrous drugs?
vi.	Enumerate the factors affecting heat transfer by radiation.
vii.	What is Short Path Distillation?
viii.	Define Filter aids. Give two examples.
ix.	Write the advantage and disadvantage of V- Cone blender.
x.	Define Ultracentrifugation.

Section B
(2 X 10 = 20)

2.	Write a detail note on plate and frame filter.
3.	What is Fractional Distillation? Describe its applications in Pharmacy.
4.	Explain in detail different types of Corrosion and methods of their preventions.

Section C
(7 X 5 = 35)

5.	Write construction and working of Ball mill.
6.	Describe various modes of motion used in size separation.
7.	Discuss in detail about multi-pass heater.
8.	Elaborate the factors influencing the Evaporation.
9.	Discuss principle and working of Fluidized bed dryer.
10.	Explain briefly equipments employed for mixing of liquids-liquids.
11.	Differentiate between Single-effect and Multi-effect evaporators.
12.	Write a note on Molecular Distillation.
13.	Discuss in detail Super-centrifuge.

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11/7/22 M

Programme	B. Pharmacy
Semester	3rd
Subject	Pharmaceutical Engineering
Subject Code	BP304T
Paper ID	75108
Time	3Hours
Maximum Marks	75

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Section A   (10 X 2 = 20)

1. Give very short answers to the followings (2 marks each):

i.	What is Reynold's number?
ii.	What is sieve number?
iii.	Mention four filter aids.
iv.	Mention the types of glass used for packaging liquids.
v.	Define crystal lattice.
vi.	Explain dehumidification process.
vii.	Explain Meir's supersaturation theory.
viii.	Define CMC.
ix.	Distinguish between Evaporation and Drying.
x.	Give principle behind Azeotropic distillation.

Section B   (2 X 10 = 20)

2.	Explain the Bernoullis theorem and highlighted how it is used to find rate of flow of fluids in a horizontal pipe?
3.	Write an explanatory note on rising film and falling film evaporators.
4.	Define the devices used for transportation of solids. Describe pneumatic conveyors.

Section C   (7 X 5 = 35)

5.	Explain the factors effecting size reduction.
6.	Give principle and working of cyclone separator.
7.	Explain the principal and working of basket centrifuge.
8.	Enumerate theories, types, prevention of corrosions.
9.	Discuss the principle and construction of orifice meter.
10.	Write a note of Silverson mixer.
11.	Discuss the principle of flash distillation.
12.	Discuss the working of refrigerator.
13.	Explain industrial pollution and control.

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Section- A   (10X2=20)

1.	Give very short answers to the followings
i.	Classify the distillation method.
ii.	Give the principle of drum dryer.
iii.	What is Rittinger's Law?
iv.	Differentiate between evaporation and drying.
v.	Define mode of heat transfer.
vi.	Write two application of centrifugation.
vii.	What are filter aids and its examples?
viii.	Define galvanic corrosion.
ix.	Define Reynolds number.
x.	What is the difference between propeller and turbine?

Section- B   (2X10=20)

2.	Explain the mechanism of drying with the help of typical drying curve. Describe the working of a spray dryer.
3.	Describe the types of manometers and their applications. Write a note on various types of energy losses.
4.	Explain the mechanism of heat transfer. Discuss the operation of heat exchangers.

Section- C   (7X5=35)

5.	Discuss the construction and working of pitot tube.
6.	Describe the principle behind freeze dryers.
7.	Write a note on molecular distillation.
8.	Write a note on filter press.
9.	Discuss the construction of cutter mill.
10.	Enumerate theories, types and prevention of corrosion.
11.	Write a note on sigma blade mixers.
12.	Describe the principle of cyclone separator.
13.	Write a note on mechanism involved in solid liquid mixing.

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Section- A   (10 X2 = 20)

1.	Define the followings-
i.	Heat Exchanger.
ii.	Impact and attrition.
iii.	Size separation.
iv.	Straining.
v.	Evaporation.
vi.	Bound water.
vii.	Equilibrium Moisture Content (EMC).
viii.	Enlargement Losses.
ix.	Centrifugation.
x.	Dry Corrosion.

Section- B   (2 X 10 = 20)

2.	Give the principle, construction and working of ball mill with the help of well labelled diagram.
3.	Explain the principle, construction and working of silverson mixer- emulsifier with the help of well labelled diagram.
4.	Give the principle, construction and working of plate and frame filter press with the help of well labelled diagram.

Section- C   (7 X 5 = 35)

5.	Give the construction and working of cyclone separator.
6.	Define filtration and explain in detail the factors influencing the rate of filtration.
7.	Describe fractional distillation.
8.	Explain the factors influencing selection of materials for plant construction.
9.	Give the construction and working of horizontal tube evaporator.
10.	Explain the applications of drying in the pharmaceutical industry.
11.	Give the construction and working of spray dryer.
12.	Describe Reynold's experiment.
13.	Give the construction and working of perforated basket centrifuge.

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Section A (10 X 2 = 20)

1.	Give very short answers to the following:
i.	State Bernoulli's theorem.
ii.	Define Kick's and Rittinger's Law.
iii.	Define the Black body.
iv.	Explain the economy of an evaporator.
v.	Define Flash Distillation.
vi.	What is the residence time for drying in fluidized bed dryer and in tray dryer?
vii.	Why propellers are used in mixing?
viii.	Describe the mechanism of filtration.
ix.	How much power is required for starting and running of perforated basket centrifuge?
x.	Give the name of corrosion inhibitors.

Section B (2 X 10 = 20)

2.	Describe various mechanisms of heat transfer and discuss heat exchangers.
3.	Classify size reduction and describe the ball mill with its variants.
4.	Explain the principle of centrifugation and describe the perforated basket centrifuge.

Section C (7 X 5 = 35)

5.	Explain the mechanism of mixing in solids and liquids.
6.	Write a note on steam distillation.
7.	Write a note on the equilibrium relationship and rate relationship in drying.
8.	Discuss the construction and working of the leaf filter.
9.	Explain types of corrosion.
10.	Describe the principle, construction and working of climbing film evaporators.
11.	Write a note on venturimeter.
12.	Explain various grades of powders along with the sieve number.
13.	Explain factors affecting during materials selected for pharmaceutical plant construction.

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Section- A   (10X2=20)

1.	Give very short answers to the followings:
i.	What is significance of Reynolds number?
ii.	What is the Fourier's law?
iii.	Define centrifugation.
iv.	Write the principle of vacuum dryer.
v.	Define liquid-liquid mixing.
vi.	Differentiate between surface filtration & depth filtration.
vii.	Discuss the advantages of double cone blender.
viii.	Why is size reduction important in pharmacy?
ix.	Define term attrition and impact.
x.	Differentiate between fluid statics and fluid dynamics.

Section- B   (2X10=20)

2.	Explain the principles, constructions, working, uses, merits and demerits of ball mill with suitable diagram.
3.	Discuss in detail about the principle, construction, working uses of freeze dryer.
4.	State and drive Bernoulli's equation.

Section- C   (7X5=35)

5.	Describe application and mechanism of size reduction.
6.	What is corrosion? Write in detail about theory of corrosion.
7.	Distinguish between solid mixing and liquid mixing. Add a note on mechanism of solid mixing and liquid mixing.
8.	Describe principle, construction and working of fluidized bed dryer.
9.	What is principle of simple distillation? Write in detail about steam distillation.
10.	Classify evaporators. What is the factor influencing evaporation?
11.	Write note on heat exchangers.
12.	Discuss the construction and working of rotary drum filters.
13.	Give principle and working of cyclone separators.

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Section- A   (10X2=20)

1.	Give very short answers to the followings:
i.	Define energy loss.
ii.	How would you describe laminar flow?
iii.	Explain the concept of a black body.
iv.	What characterizes an azeotropic mixture?
v.	What does ideal mixing refer to?
vi.	What is drying?
vii.	Give Raoult's law.
viii.	Define centrifugation.
ix.	What are ferrous and non ferrous metals?
x.	What is a filter cake?

Section- B   (2X10=20)

2.	Describe the principle, construction and working of an orifice meter using a diagram and give its advantages over Venturi meter.
3.	Enlist factors influencing mixing and give principle, construction and working of Silverson emulsifier.
4.	Describe the principle, construction and working of plate and frame filter press using a diagram.

Section- C   (7X5=35)

5.	What is flash distillation, and what equipment is used in this process?
6.	Describe the different types of corrosion.
7.	Explain the construction and working of a super centrifuge.
8.	Describe the construction and working of a fluidized bed dryer.
9.	What is a shell and tube heater, and how does it function?
10.	What is the working principle of a hammer mill?
11.	Describe the operational mechanism of a steam jacketed kettle.
12.	What is a perforated basket centrifuge, and how does it work?
13.	Explain the construction and working of a cyclone separator.

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***Section C consists of Nine questions carrying 5 marks each (Short Answer); attempt any **SEVEN**.*

Section- A   (10X2=20)

1.	Give very short answers to the followings:
i.	Give the definition of conduction, convection and radiation.
ii.	Define Reynolds number with its equation.
iii.	Write the principle of edge runner mill and end runner mill.
iv.	Write the difference between evaporation and other heat process.
v.	Give the importance of Fourier's law.
vi.	Write the uses of silverson emulsifier.
vii.	Elaborate the term membrane filters
viii.	Mention principle and applications of centrifugation.
ix.	What are the types of corrosion and their prevention?
x.	Define filter aids.

Section- B   (2X10=20)

2.	Define the term size reduction. Explain in detail the principle, construction, working of fluid energy mill.
3.	Describe factors affecting during materials selected for pharmaceutical plant construction in detail.
4.	Explain in detail the Principles, construction, working, uses, merits and demerits of sieve shaker.

Section- C   (7X5=35)

5.	Write a short note on heat transfer mechanisms.
6.	Give basic principles and methodology of simple distillation and flash distillation.
7.	Mention the applications and factors influencing evaporation.
8.	Define Bernoulli's theorem and its applications in flow of fluids.
9.	Differentiate between heat interchangers and heat exchangers.
10.	What is drying and rate of drying curve?
11.	Explain Working, uses, Merits and Demerits of Double cone blender.
12.	Write in detail about rotary drum filter.
13.	Give the importance of distillation under reduced pressure.

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Section- B consists of **three questions, each carrying **10 marks** (Long Answer Type); **Attempt any two.***
***Section- C **consists of nine questions, each carrying **5 marks (Short Answer Type);** Attempt any seven.*

Section- A   (10X2=20)

1.	Give very short answers to the followings:
i.	What is Reynolds number?
ii.	Define conduction and convection.
iii.	State the objectives of size reduction.
iv.	Enlist the materials used in pharmaceutical plant construction.
v.	Suggest suitable mixing equipment for semisolids.
vi.	State the principle behind centrifugal separation.
vii.	What are filter aids? Give two examples.
viii.	Mention the types of glass used for packaging liquids.
ix.	Write Fourier's law.
x.	Differentiate between evaporation and drying.

Section- B   (2X10=20)

2.	Discuss the principle, construction, working, advantages, and disadvantages of a fluid energy mill.
3.	Classify industrial centrifuges. Describe the construction and working of the perforated basket type.
4.	Explain the theories, types, and prevention methods of corrosion.

Section- C   (7X5=35)

5.	Enumerate the various factors affecting evaporation.
6.	Write the theories of filtration.
7.	Mention the various types of iron used as materials of construction.
8.	Write a note on the Sigma blade mixer.
9.	Highlight the principle and working of a Venturimeter.
10.	Write the principle and methodology of steam distillation.
11.	What are the objectives and mechanisms of size separation?
12.	Write a short note on heat exchangers.
13.	State the drying mechanism and Equilibrium Moisture Content application.

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Section- A   (10X2=20)

1.	Give very short answers to the followings:
i.	Differentiate between fluid statics and fluid dynamics
ii.	Define bound and unbound moisture.
iii.	What is flash distillation?
iv.	Define Reynolds number.
v.	What is filter aid give example?
vi.	Define Fourier's law.
vii.	Define centrifugation.
viii.	Mention the theory of corrosion.
ix.	What is multiple effect evaporation?
x.	Mention the factors affecting mixing.

Section- B   (2X10=20)

2.	Describe in detail about various factors influencing the selection of materials for the pharmaceutical plant construction.
3.	Write the theories of filtration and explain the principle, construction and working of rotary drum filter.
4.	Describe the principle, construction and working of double cone blender with neat diagram.

Section- C   (7X5=35)

5.	Mention the merits and demerits of tray dryer.
6.	Write in detail about heat transfer mechanisms.
7.	Describe various types of corrosion and methods for their prevention.
8.	Write the construction and working of cyclone separator.
9.	Describe the construction and working of hammer mill.
10.	Give the objectives, application and mechanism of heat transfer.
11.	Explain about the material handling systems.
12.	Discuss the non-perforated basket centrifuge
13.	Explain Bernoulli's theorem and its application

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