

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[LM 948]

MAY 2018

Sub. Code: 2948

M.PHARM. DEGREE EXAMINATION
(PCI New regulations 2016)
SEMESTER-II
BRANCH-II – PHARMACEUTICAL CHEMISTRY – MPC
PAPER IV – PHARMACEUTICAL PROCESS CHEMISTRY

Q.P. Code : 262948

Time : Three hours

Maximum : 75 Marks

I. Elaborate on:

(2 x 20 = 40)

1. a) Explain in detail about the impurities in Active Pharmaceutical Ingredients, types and their sources including genotoxic impurities.
b) Write briefly about principle, construction, working operation of plate and frame filter press.
2. a) Discuss elaborately about reduction by heterogeneous catalyst.
b) Explain briefly about the procedure for the production of Lovastatin.

II. Write notes on:

(7 x 5 = 35)

1. Kinetics of halogenations.
2. Effluents and its management.
3. Inprocess control and validation of large scale process.
4. Mixed acid for nitration.
5. Personal protection equipment.
6. Liquid phase oxidation with oxidizing agents.
7. Families of reagents useful for scale-up.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[LN 948]

NOVEMBER 2018

Sub. Code: 2948

M.PHARM. DEGREE EXAMINATION
(PCI New regulations 2016)
SEMESTER-II
BRANCH-II – PHARMACEUTICAL CHEMISTRY – MPC
PAPER IV – PHARMACEUTICAL PROCESS CHEMISTRY

Q.P. Code : 262948

Time : Three hours

Maximum : 75 Marks

I. Elaborate on:

(2 x 20 = 40)

1. a) Write briefly about Bench and pilot scale process.
b) Discuss elaborately about process equipment for technical nitration.
2. a) Write in detail about fire hazards, types of fire and fire extinguishers.
b) Explain the principle and general methods of preparation of polymorphs.

II. Write notes on:

(7 x 5 = 35)

1. Counter current extraction.
2. Homogeneous Catalytic hydrogenation.
3. Production of B12.
4. Material Safety data sheet.
5. Oxidation by Sodium hypochlorite.
6. Azeotropic distillation.
7. Hazard labels of chemicals.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[LO 948]

MAY 2019

Sub. Code: 2948

M.PHARM. DEGREE EXAMINATION
(PCI New regulations 2016)
SEMESTER-II
BRANCH-II – PHARMACEUTICAL CHEMISTRY – MPC
PAPER IV – PHARMACEUTICAL PROCESS CHEMISTRY

Q.P. Code : 262948

Time : Three hours

Maximum : 75 Marks

I. Elaborate on:

(2 x 20 = 40)

1. a) Write in detail about filtration, theory and types.
b) Discuss elaborately about in process control and validation of large scale process.
2. a) Discuss about Aerobic and anaerobic fermentation.
b) Discuss the production of penicillin and streptomycin.

II. Write notes on:

(7 x 5 = 35)

1. Types of Evaporators and factors affecting evaporation.
2. Principle and general methods of preparation of polymorphs.
3. Fire hazards and types of fire extinguishers.
4. Heterogeneous and homogeneous catalyst.
5. Explain about nitrating agent.
6. Material safety data sheet.
7. Genotoxic impurities.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[LP 948]

NOVEMBER 2019

Sub. Code: 2948

M.PHARM. DEGREE EXAMINATION
(PCI New regulations 2016)
SEMESTER-II
BRANCH-II – PHARMACEUTICAL CHEMISTRY – MPC
PAPER IV – PHARMACEUTICAL PROCESS CHEMISTRY

Q.P. Code : 262948

Time : Three hours

Maximum : 75 Marks

I. Elaborate on:

(2 x 20 = 40)

1. Write the principle and general methods of preparation of polymorphs, hydrates, solvates and amorphous APIs.
2. a) Write the types of oxidative reactions.
b) Write about non metallic oxidizing agents.

II. Write notes on:

(7 x 5 = 35)

1. Write the production of lovastatin and Simvastatin.
2. Streamlining reaction steps and route selection.
3. Characteristics of cost-effective routes.
4. Occupational health and safety assessment series 1800.
5. Pressure and vacuum filtration.
6. Explain about Ozonolysis.
7. Case study on industrial halogenations process.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[LQ 0121]

JANUARY 2021

Sub. Code: 2948

(APRIL 2020 EXAM SESSION)

M.PHARMACY DEGREE EXAMINATION

SEMESTER-II (PCI New regulations 2016)

PHARMACEUTICAL CHEMISTRY – MPC

PAPER IV – PHARMACEUTICAL PROCESS CHEMISTRY

Q.P. Code : 262948

Time : Three hours

Answer ALL Questions

Maximum : 75 Marks

I. Elaborate on:

(2 x 20 = 40)

1. Discuss elaborately about nitrating agents, aromatic nitration with kinetics and mechanism and mixed acid for nitration.
2. a) Write a detailed note about In-process control and validation of large scale process.
b) Explain azeotropic and steam distillation methods with suitable examples.

II. Write notes on:

(7 x 5 = 35)

1. Catalytic hydrogenation.
2. Production of Simvastatin.
3. Characteristics of cost-effective routes.
4. Types of fire and fire extinguishers.
5. Ozonolysis.
6. Crystallization from aqueous and non aqueous solutions.
7. Pressure and vacuum filtration.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[MPHARM 0921]

**SEPTEMBER 2021
(OCTOBER 2020 EXAM SESSION)**

Sub. Code: 2948

**M.PHARMACY DEGREE EXAMINATION
SEMESTER-II (PCI New regulations 2016)
PHARMACEUTICAL CHEMISTRY - MPC
PAPER IV – PHARMACEUTICAL PROCESS CHEMISTRY
*Q.P. Code : 262948***

Time : Three hours

Answer ALL Questions

Maximum : 75 Marks

I. Elaborate on:

(2 x 20 = 40)

1. a) Explain in detail about the process equipment for technical nitration.
b) Write in detail about fire hazards, type of fire and fire extinguishers.
2. Explain in detail about bench and pilot scale process.

II. Write notes on:

(7 x 5 = 35)

1. Theory of filtration.
2. Write note on Kinetics of halogenation.
3. Production of penicillin.
4. Write note on homogeneous catalysis.
5. Counter current extraction.
6. Write note on Ozonolysis.
7. Explain Material Safety data sheet.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[M.PHARM 0922]

**SEPTEMBER 2022
(APRIL 2022 EXAM SESSION)**

Sub. Code: 2948

**M.PHARMACY DEGREE EXAMINATION
SEMESTER - II (PCI New regulations 2016)
PHARMACEUTICAL CHEMISTRY - MPC
PAPER IV – PHARMACEUTICAL PROCESS CHEMISTRY**

Q.P. Code : 262948

Time : Three hours

Answer ALL Questions

Maximum : 75 Marks

I. Elaborate on:

(2 x 20 = 40)

1. a) Explain crystallization from aqueous and non aqueous solution.
b) Discuss the Factors affecting Crystallization.
2. Describe about the Nitrating agents, aromatic nitration, kinetics and mechanism of Aromatic nitration in detail.

II. Write notes on:

(7 X 5 = 35)

1. Explain about the production of Vitamin B₁₂ by fermentation.
2. Describe about Personal Protection Equipment (PPE).
3. Discuss about the Characteristic of expedient routes and cost effective routes.
4. What are Non metallic oxidizing agents? And discuss about Sodium hypochlorite.
5. Briefly explain about the counter current extraction.
6. What are Fire Hazards? Explain the types of Fire extinguishers in detail.
7. Write about the In - process control and validation of large scale process.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[M.PHARM 0423]

**APRIL 2023
(OCTOBER 2022 EXAM SESSION)**

Sub. Code: 2948

**M.PHARMACY DEGREE EXAMINATION
SEMESTER - II (PCI New regulations 2016)
PHARMACEUTICAL CHEMISTRY - MPC
PAPER IV – PHARMACEUTICAL PROCESS CHEMISTRY**

Q.P. Code: 262948

Time : Three hours

Answer ALL Questions

Maximum : 75 Marks

I. Elaborate on:

(2 x 20 = 40)

1. a) Write the Theory of Filtration and Centrifugal Filtration in detail.
b) Discuss about the Extraction with Reflux and Agitation in detail.
2. a) Describe about Types of Halogenations and Kinetics of halogenations.
b) Discuss about the Stages of scale up process.

II. Write notes on:

(7 X 5 = 35)

1. Explain about Occupational Health and Safety Data sheet (OHSAS-1800).
2. Describe about the production of Simvastatin by Fungal fermentation.
3. Discuss about the Characteristic of reagent selection and the families of reagents useful for scale up.
4. How does Effluent treatment plant works and discuss about the management.
5. Briefly explain about the Equipment for technical nitration.
6. Discuss the types of Oxidative reactions and explain about Ozonolysis.
7. Write about the Azeotropic and Steam distillation.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[M.PHARM 0823]

**AUGUST 2023
(APRIL 2023 EXAM SESSION)**

Sub. Code: 2948

**M.PHARMACY DEGREE EXAMINATION
SEMESTER - II (PCI New Regulations 2016)
PHARMACEUTICAL CHEMISTRY - MPC
PAPER IV – PHARMACEUTICAL PROCESS CHEMISTRY**

Q.P. Code: 262948

Time : Three hours

Answer ALL Questions

Maximum : 75 Marks

I. Elaborate on:

(2 x 20 = 40)

1. Discuss in detail about the Types of Evaporators and write a note on Factors affecting evaporation.
2. Explain in detail about the Impurities in API, types and their sources including genotoxic impurities.

II. Write notes on:

(7 x 5 = 35)

1. Write a note on MSDS (Material Safety Data Sheet).
2. Discuss about the Liquid phase oxidation with oxidizing agents.
3. What is pilot plant? Explain in detail about the pilot plant techniques used in pharmaceutical industry.
4. Explain about the production of Antibiotic Streptomycin by Fermentation.
5. Describe about the Hydrogen Transfer reaction and explain about the Case study on industrial reduction process.
6. Briefly explain about Streamlining reaction steps and reagent selection.
7. Write about the Mixed Acid for nitration.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[M.PHARM 1223]

**DECEMBER 2023
(OCTOBER 2023 EXAM SESSION)**

Sub. Code: 2948

**M.PHARMACY DEGREE EXAMINATION
SEMESTER - II (PCI New Regulations 2016)
PHARMACEUTICAL CHEMISTRY - MPC
PAPER IV – PHARMACEUTICAL PROCESS CHEMISTRY**

Q.P. Code: 262948

Time: Three hours

Answer ALL Questions

Maximum: 75 Marks

I. Elaborate on:

(2 x 20 = 40)

1. a) Discuss in detail about reduction by heterogeneous catalyst.
b) Explain briefly about the procedure for the production of Streptomycin.
2. a) Discuss in brief about process equipment for technical nitration.
b) Write about the types of oxidative reactions and liquid phase oxidation with oxidizing agents.

II. Write notes on:

(7 x 5 = 35)

1. Material Safety data sheet.
2. Steam distillation.
3. Families of reagents useful for scale-up.
4. Counter current extraction.
5. In process control and validation of large scale process.
6. Effluents and its management.
7. Factors affecting crystallization.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[M.PHARM 1124]

NOVEMBER 2024

Sub. Code: 2948

**M.PHARMACY DEGREE EXAMINATION
SEMESTER - II (PCI New Regulations 2016)
PHARMACEUTICAL CHEMISTRY - MPC
PAPER IV – PHARMACEUTICAL PROCESS CHEMISTRY**

Q.P. Code: 262948

Time: Three hours

Answer ALL Questions

Maximum: 75 Marks

I. Elaborate on:

(2 x 20 = 40)

1. Discuss about Oxidation in unit processes especially in Non-metallic agents.
2. a) Write briefly Crystallization in unit operations.
b) Principle and general methods of preparation of solvates and amorphous APIs.

II. Write notes on:

(7 x 5 = 35)

1. Counter current extraction.
2. In-process control and validation of large scale process.
3. Production of simvastatin.
4. Process equipment for technical nitration.
5. Hydrogen-transfer reaction.
6. ISO-14001.
7. Types of evaporators, factors affecting evaporation.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[M.PHARM 0425]

APRIL 2025

Sub. Code: 2948

**M.PHARMACY DEGREE EXAMINATION
SEMESTER - II (PCI New Regulations 2016)
PHARMACEUTICAL CHEMISTRY - MPC
PAPER IV – PHARMACEUTICAL PROCESS CHEMISTRY**

Q.P. Code: 262948

Time: Three hours

Answer ALL Questions

Maximum: 75 Marks

I. Elaborate on:

(2 x 20 = 40)

1. Explain in detail about the impurities in Active Pharmaceutical Ingredients types and their sources. Add a note on genotoxic impurities.
2. Describe about Types of Halogenations and Kinetics of halogenations.

II. Write notes on:

(7 x 5 = 35)

1. Briefly explain Catalytic hydrogenation.
2. Discuss the principle and general methods of preparation of polymorphs.
3. Write about the In – process control and validation of large-scale process.
4. Explain Oxidation by Sodium hypochlorite.
5. Write a brief note on Material Safety data sheet.
6. Briefly explain the production of penicillin.
7. Describe about Personal Protection Equipment (PPE).

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[M.PHARM 1025]

OCTOBER 2025

Sub. Code: 2948

M.PHARMACY DEGREE EXAMINATION
SEMESTER - II (PCI New Regulations 2016)
PHARMACEUTICAL CHEMISTRY - MPC
PAPER IV – PHARMACEUTICAL PROCESS CHEMISTRY

Q.P. Code: 262948

Time: Three hours

Answer ALL Questions

Maximum: 75 Marks

I. Elaborate on:

(2 x 20 = 40)

1. Explain azeotropic and steam distillation methods with suitable examples.
2. a) Discuss about Aerobic and anaerobic fermentation.
b) Discuss the production of penicillin and streptomycin.

II. Write notes on:

(7 x 5 = 35)

1. Discuss the types of Oxidative reactions. Write a note on Ozonolysis.
2. Explain briefly the procedure for the production of Lovastatin.
3. Write a brief note on Streamlining reaction steps and route selection.
4. Discuss about Effluents and its management.
5. Explain about Occupational Health and Safety Data sheet.
6. Briefly explain about counter current extraction.
7. Explain Genotoxic impurities.
