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Faculty of Health Sciences
Bachelor of Science Honours in Industrial Pharmaceutical Science
Bachelor of Science Honours in Cosmetic Sciences
IPS 3124 – Pharmaceutical Engineering - I
BCS 3143 – Cosmetic Technology - I
3rd year 1st semester
End Semester Assignment

Date: 16th July 2026

Time: 01.30 p.m. – 02.30 p.m. (One hour)

INSTRUCTIONS TO CANDIDATES

- This question paper consists of **TWO** questions.
- Answer **ALL** questions.
- You should write legibly in black or blue ink.

Question 01

(100 marks)

A pharmaceutical company manufactures a crystalline active pharmaceutical ingredient (API) that is supplied as a dry powder for further formulation. After several months of storage, severe caking and agglomeration of the powder were observed. Preliminary investigations suggested that the problem may be related to the crystallization process and post-crystallization handling conditions. During the investigation, the formulation team also reviewed the filtration stage of production, where excessive filter cake formation had been reported. The use of filter aids was proposed as a strategy to improve filtration performance and reduce processing difficulties.

Based on this scenario, answer the following questions:

- 1.1 State **four (04)** possible crystallization-related factors that may have contributed to the caking of the powder. (30 marks)
- 1.2 Recommend suitable modifications to the crystallization process and post-crystallization handling to minimize caking. Justify each recommendation scientifically. (35 Marks)
- 1.3 Describe **four (04)** ideal characteristics of a filter aid and provide two common examples of filter aids used in pharmaceutical or chemical processing. (35 Marks)

Question 02

(100 marks)

- 2.1 Elaborate the importance of humidity control in manufacturing of pharmaceuticals or cosmeceuticals with suitable practical examples. (50 marks)
- 2.2 Outline using a suitable diagram, how do you measure the humidity related parameters in a psychrometric chart. (50 marks)

Faculty of Health Sciences
Bachelor of Science Honors in Industrial Pharmaceutical Science/ Bachelor of
Science Honors in Medical and Health Product Management
IPS 3143/MHPM 3123 Industrial Pharmaceutics II/ Pharmaceutics II
Batch 07
3rd Year 1st Semester
End Semester Examination - SEQ

Date : 16th of February 2026

Time : 9.00 a.m. - 12.00 noon (Three hours)

INSTRUCTIONS TO CANDIDATES

- This question paper consists of **SIX** structured essay type questions.
- Answer **ALL** the questions.
- Final answers should be given legibly in black or blue ink.

Question 01 **(100 marks)**

- 1.1 State **four (04)** characteristics of liniments. (20 marks)
- 1.2 List **four (04)** types of water used in pharmaceutical processes. (20 marks)
- 1.3 Mention the mechanism of action and **one (01)** example for each of the following types of excipients used in solution dosage forms.
 - 1.3.1 Buffers (15 marks)
 - 1.3.2 Chelating agents (15 marks)
- 1.4 Illustrate a suitable labelled diagram and elaborate how the zeta (ζ) potential develops around a solid particle suspended in a liquid medium. (30 marks)

Question 02 **(100 marks)**

- 2.1 What are the characteristics of a 'flocculated suspension'? (20 marks)
- 2.2 Outline the use of electrolytic flocculating agents in suspensions. (20 marks)
- 2.3 Differentiate macroemulsions and microemulsions. (30 marks)
- 2.4 Discuss how to use hydrophilic-lipophilic balance (HLB) value of emulsifiers to optimize an emulsion dosage form, giving suitable examples. (30 marks)

Question 03 **(100 marks)**

- 3.1 Classify emulsifying agents based on their ionic nature. (20 marks)
- 3.2 Outline the following methods of emulsion manufacture.
 - 3.2.1 Wet gum method (15 marks)
 - 3.2.2 Membrane emulsification method (15 marks)

- 3.3 Discuss the use of synthetic rubber in pharmaceutical equipment. (20 marks)
- 3.4 Compare and contrast the various types of stainless steel that can be used in the fabrication of pharmaceutical equipment. (30 marks)

Question 04 (100 marks)

- 4.1 "Products which pass microbial enumeration tests are considered to be sterile products." Verify the validity of this statement and justify your answer. (20 marks)
- 4.2 Classify biologicals while giving **two (02)** examples for each. (20 marks)
- 4.3 Assess the rationale for developing sterile dosage forms. (30 marks)
- 4.4 Apply your knowledge of good manufacturing practices (GMP) to list **six (06)** control measures taken to maintain 'Grade A' cleanliness in an aseptic processing area. (30 marks)

Question 05 (100 marks)

- 5.1 State the impact of synergist type of antioxidants with examples. (20 marks)
- 5.2 Justify the reason for choosing glass as the preferred packaging material for single-dose sterile dosage forms. (20 marks)
- 5.3 Illustrate aseptic processing using a suitable process flow diagram. (30 marks)
- 5.4 Write a brief account on direct inoculation method of testing sterility. (30 marks)

Question 06 (100 marks)

- 6.1 State the significance of standardization of excipients. (15 marks)
- 6.2 Mention **five (05)** objectives of standardization. (25 marks)
- 6.3 Outline the procedure to carry out weight variation test for hard gelatin capsule products. (25 marks)
- 6.4 Friability test is an essential quality control test for tablet dosage forms.
- 6.4.1 Calculate the friability of a tablet sample whose initial weight was 6.5784 g and the final weight after subjecting to 100 rotations was 6.5192 g. (20 marks)
- 6.4.2 Analyze the results obtained in above 6.4.1 and comment on whether this particular batch of tablets are suitable for further coating. (15 marks)

Faculty of Health Sciences

Bachelor of Science Honours in Industrial Pharmaceutical Science/ Bachelor of Science in
 Medical & Health Product Management

IPS 3133 – Advanced Medicinal Chemistry I/ MHPM 3133 - Medicinal Chemistry I

IPS - Batch 07/ MHPM – Batch 02

3rd year 1st Semester

End Semester SEQ Examination

Date: 13th February 2026

Time: 09.00 a.m. – 12.00 noon (Three hours)

INSTRUCTIONS TO CANDIDATES

- This question paper consists of **SIX (06)** questions.
- Answer **ALL** questions.
- You should write legibly in black or blue ink.

Question 01**(100 Marks)**

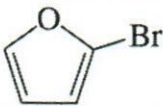
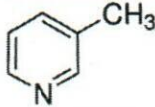
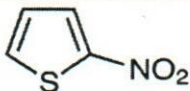
1.1 State the hetero atoms in the following compounds.

- | | |
|-----------------|-----------|
| 1.1.1 Pyridine | (5 Marks) |
| 1.1.2 Furan | (5 Marks) |
| 1.1.3 Imidazole | (5 Marks) |
| 1.1.4 Thiophene | (5 Marks) |

1.2 Draw the structures for the following compounds.

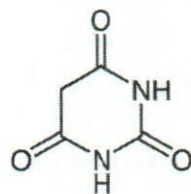
- | | |
|---------------------------------|------------|
| 1.2.1 Benzofuran | (10 Marks) |
| 1.2.2 2-chloro-5-nitropyridine | (10 Marks) |
| 1.2.3 2-chloro-5-nitrothiophene | (10 Marks) |
| 1.2.4 2-methyl-4-nitroimidazole | (10 Marks) |
| 1.2.5 Benzimidazole | (10 Marks) |

1.3 Identify the following heterocyclic structures and write the correct IUPAC name or common name. (3×10 Marks = 30 Marks)

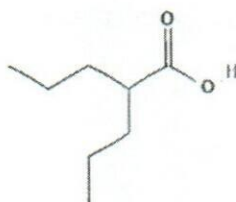
Heterocyclic compound	IUPAC name
	1.3.1
	1.3.2
	1.3.3

Question 02**(100 Marks)**

- 2.1 Draw the chemical structure of phenobarbital, using the barbituric acid nucleus given below in Structure A. (20 Marks)

**Structure A**

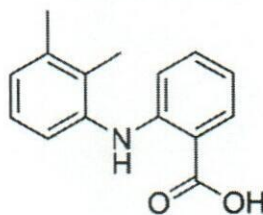
- 2.2 Compare the structural features of thiobarbiturates and pentobarbital with those of phenobarbital, highlighting key differences in their chemical structures. (15 Marks)
- 2.3 Critically analyze the structure–activity relationship (SAR) of barbiturates, with reference to substitutions at the 5-position and heteroatom modifications. (25 Marks)
- 2.4 Following structure B shows the structure of an antiepileptic drug.
- 2.4.1 Identify the compound represented by Structure B, which also acts as an antiepileptic agent. (10 Marks)

**Structure B**

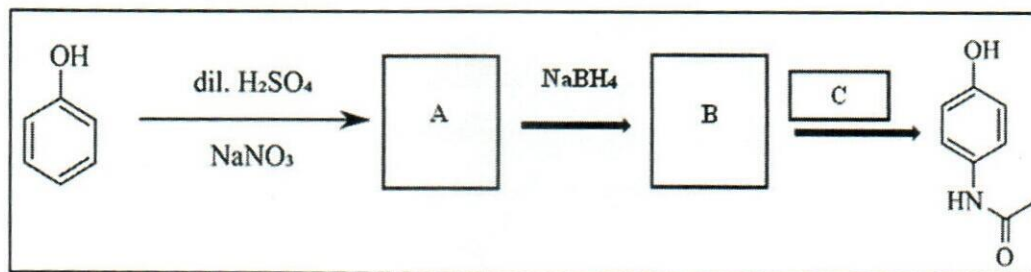
- 2.4.2 Discuss the significance of the key structural features of this compound in relation to its pharmacological (antiepileptic) activity. (30 Marks)

Question 03**(100 Marks)**

- 3.1 The structure of mefenamic acid, an anthranilic acid derivative, is shown below.



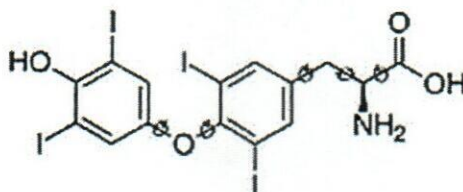
- 3.1.1 List **three (03)** structural features of mefenamic acid that can influence its biological activity. (15 Marks)
- 3.2 The diagram below shows an incomplete synthesis pathway of acetaminophen (paracetamol) starting from phenol.



- 3.2.1 Draw the structures of the intermediate products A and B. (30 Marks)
- 3.2.2 Name the reactant C. (10 Marks)
- 3.3 Evaluate **three (03)** importance of the drug nomenclature system in pharmaceutical science. (15 Marks)
- 3.4 Define an innovator drug. (15 Marks)
- 3.5 Differentiate **one (01)** feature of proprietary drug names and non-proprietary names. (15 Marks)

Question 04**(100 Marks)**

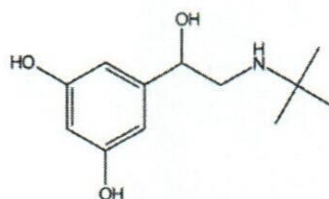
- 4.1 Glimepiride and glipizide are common antihyperglycemic agents.
- 4.1.1 Identify the pharmacological class which glimepiride and glipizide belong to. (10 Marks)
- 4.1.2 Draw the general (common) chemical structure of this class of drugs. (25 Marks)
- 4.1.3 Explain the structure–activity relationship (SAR) of this class, emphasizing the role of the sulfonylurea moiety and substituent variations. (30 Marks)
- 4.2
- 4.2.1 Label the major functional groups and structural features present in Structure C. (20 Marks)

**Structure C**

- 4.2.2 Using the structure provided above (Structure C), compare the chemical structures of thyroxine (T4) and triiodothyronine (T3). (15 Marks)

Question 05**(100 Marks)**

- 5.1 State the affinity and intrinsic activity associated with agonists and antagonists. (10 Marks)
- 5.2 Refer the chemical structure given below.

**Figure 01**

5.2.1 Identify the chemical structure in Figure 01 above. (20 Marks)

5.2.2 Identify the chemical modifications introduced into the above structure (Figure 01) to enhance β_2 -adrenergic receptor activity and reduce enzymatic metabolism. (20 Marks)

5.3

5.3.1 Identify the chemical structure (Figure 02) given below. (20 Marks)

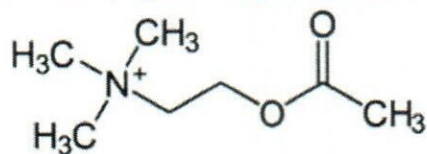


Figure 02

5.3.2 How does the activity of the above compound change with the following modifications?

5.3.2.1 Presenting with an ethylene bridge (10 Marks)

5.3.2.2 Presenting of two methyl groups on amine group (10 Marks)

5.3.2.3 Absence of the ester group (10 Marks)

Question 06

(100 Marks)

6.1

6.1.1 What is the class of below mentioned antihistamine (Figure 03)? (20 Marks)

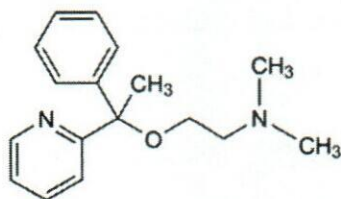


Figure 03

6.1.2 Identify the chemical modification in the above compound (Figure 03) that enhances its anti-histamine activity. (20 Marks)

6.2 "The imidazole ring of histamine is not essential for the anti-ulcer activity". Justify this statement. (30 Marks)

6.3 Draw the chemical structures of omeprazole and pantoprazole by using pharmacophore given in Figure 04 below. (30 Marks)

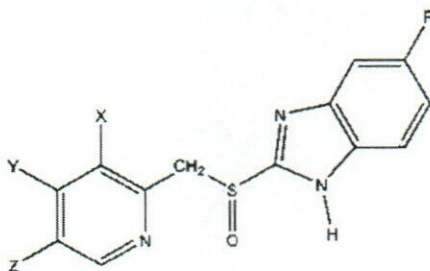


Figure 04

Faculty of Health Sciences

Bachelor of Science Honours in Industrial Pharmaceutical Science/ Bachelor of Science in
 Medical & Health Product Management

IPS 3133 – Advanced Medicinal Chemistry I/ MHPM 3133 - Medicinal Chemistry I

IPS - Batch 07/ MHPM – Batch 02

3rd year 1st Semester

End Semester SEQ Examination

Date: 13th February 2026

Time: 09.00 a.m. – 12.00 noon (Three hours)

INSTRUCTIONS TO CANDIDATES

- This question paper consists of **SIX (06)** questions.
- Answer **ALL** questions.
- You should write legibly in black or blue ink.

Question 01**(100 Marks)**

1.1 State the hetero atoms in the following compounds.

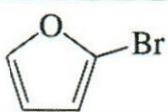
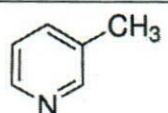
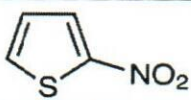
- | | |
|-----------------|-----------|
| 1.1.1 Pyridine | (5 Marks) |
| 1.1.2 Furan | (5 Marks) |
| 1.1.3 Imidazole | (5 Marks) |
| 1.1.4 Thiophene | (5 Marks) |

1.2 Draw the structures for the following compounds.

- | | |
|---------------------------------|------------|
| 1.2.1 Benzofuran | (10 Marks) |
| 1.2.2 2-chloro-5-nitropyridine | (10 Marks) |
| 1.2.3 2-chloro-5-nitrothiophene | (10 Marks) |
| 1.2.4 2-methyl-4-nitroimidazole | (10 Marks) |
| 1.2.5 Benzimidazole | (10 Marks) |

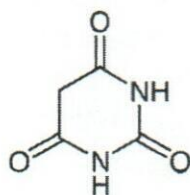
1.3 Identify the following heterocyclic structures and write the correct IUPAC name or common name.

(3×10 Marks = 30 Marks)

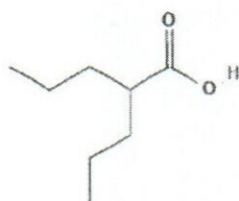
Heterocyclic compound	IUPAC name
	1.3.1
	1.3.2
	1.3.3

Question 02**(100 Marks)**

- 2.1 Draw the chemical structure of phenobarbital, using the barbituric acid nucleus given below in Structure A. (20 Marks)

**Structure A**

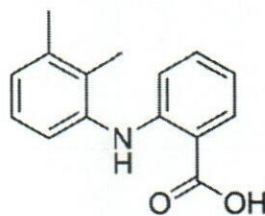
- 2.2 Compare the structural features of thiobarbiturates and pentobarbital with those of phenobarbital, highlighting key differences in their chemical structures. (15 Marks)
- 2.3 Critically analyze the structure–activity relationship (SAR) of barbiturates, with reference to substitutions at the 5-position and heteroatom modifications. (25 Marks)
- 2.4 Following structure B shows the structure of an antiepileptic drug.
- 2.4.1 Identify the compound represented by Structure B, which also acts as an antiepileptic agent. (10 Marks)

**Structure B**

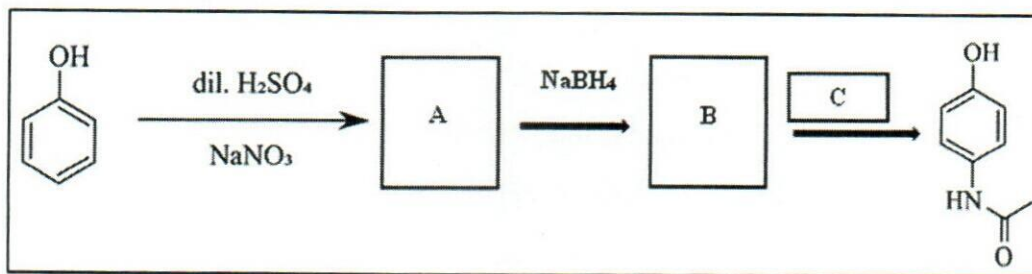
- 2.4.2 Discuss the significance of the key structural features of this compound in relation to its pharmacological (antiepileptic) activity. (30 Marks)

Question 03**(100 Marks)**

- 3.1 The structure of mefenamic acid, an anthranilic acid derivative, is shown below.



- 3.1.1 List **three (03)** structural features of mefenamic acid that can influence its biological activity. (15 Marks)
- 3.2 The diagram below shows an incomplete synthesis pathway of acetaminophen (paracetamol) starting from phenol.

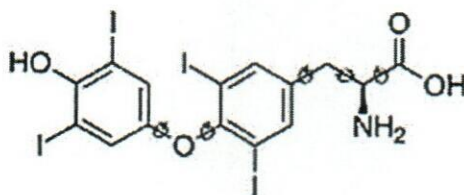


- 3.2.1 Draw the structures of the intermediate products A and B. (30 Marks)
- 3.2.2 Name the reactant C. (10 Marks)
- 3.3 Evaluate **three (03)** importance of the drug nomenclature system in pharmaceutical science. (15 Marks)
- 3.4 Define an innovator drug. (15 Marks)
- 3.5 Differentiate **one (01)** feature of proprietary drug names and non-proprietary names. (15 Marks)

Question 04

(100 Marks)

- 4.1 Glimepiride and glipizide are common antihyperglycemic agents.
- 4.1.1 Identify the pharmacological class which glimepiride and glipizide belong to. (10 Marks)
- 4.1.2 Draw the general (common) chemical structure of this class of drugs. (25 Marks)
- 4.1.3 Explain the structure–activity relationship (SAR) of this class, emphasizing the role of the sulfonylurea moiety and substituent variations. (30 Marks)
- 4.2
- 4.2.1 Label the major functional groups and structural features present in Structure C. (20 Marks)



Structure C

- 4.2.2 Using the structure provided above (Structure C), compare the chemical structures of thyroxine (T4) and triiodothyronine (T3). (15 Marks)

Question 05

(100 Marks)

- 5.1 State the affinity and intrinsic activity associated with agonists and antagonists. (10 Marks)
- 5.2 Refer the chemical structure given below.

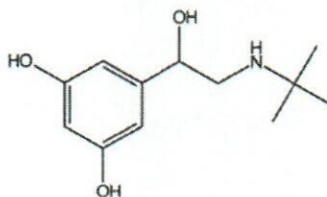


Figure 01

5.2.1 Identify the chemical structure in Figure 01 above. (20 Marks)

5.2.2 Identify the chemical modifications introduced into the above structure (Figure 01) to enhance β_2 -adrenergic receptor activity and reduce enzymatic metabolism. (20 Marks)

5.3

5.3.1 Identify the chemical structure (Figure 02) given below. (20 Marks)

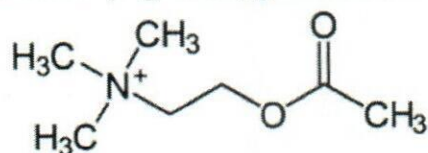


Figure 02

5.3.2 How does the activity of the above compound change with the following modifications?

5.3.2.1 Presenting with an ethylene bridge (10 Marks)

5.3.2.2 Presenting of two methyl groups on amine group (10 Marks)

5.3.2.3 Absence of the ester group (10 Marks)

Question 06

(100 Marks)

6.1

6.1.1 What is the class of below mentioned antihistamine (Figure 03)? (20 Marks)

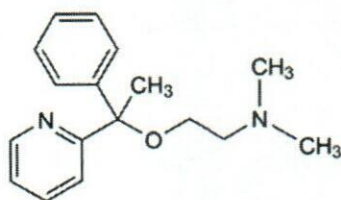


Figure 03

6.1.2 Identify the chemical modification in the above compound (Figure 03) that enhances its anti-histamine activity. (20 Marks)

6.2 "The imidazole ring of histamine is not essential for the anti-ulcer activity". Justify this statement. (30 Marks)

6.3 Draw the chemical structures of omeprazole and pantoprazole by using pharmacophore given in Figure 04 below. (30 Marks)

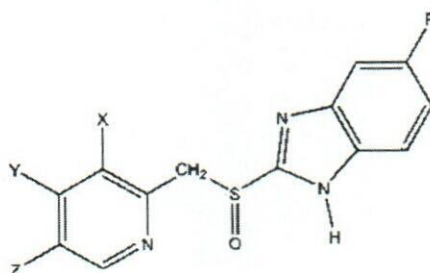


Figure 04



Faculty of Health Sciences
B.Sc. (Hons) Biomedical Sciences/B.Sc. (Hons) Industrial Pharmaceutical Sciences/
B.Sc. (Hons) Cosmetic Sciences/ B.Sc. Hons in Medical and Health Product Management
Pharmacology I – BMS 3113/ IPS 3113/ BCS 3113/MHPM 3113
3rd year 1st Semester
End Semester SEQ Examination
7th Batch

Date	: 9th February 2026
Time	: 9.00 a.m. – 12.00 p.m. (Three hours)

INSTRUCTIONS TO CANDIDATES

- This question paper consists of **SIX** questions.
- Answer **ALL** questions.

Question 01

(100 marks)

- | | | |
|-----|--|------------|
| 1.1 | List three (03) antifungal agents used in clinical practice. | (15 marks) |
| 1.2 | Classify the major classes of antiretroviral drugs used in HIV/AIDS. | (25 marks) |
| 1.3 | Relate the mechanism of action of gentamicin in the treatment of infective endocarditis. | (30 marks) |
| 1.4 | Justify the reason for combination therapy in first-line tuberculosis management. | (30 marks) |

Question 02

(100 marks)

A 60-year-old patient with atrial fibrillation was prescribed with warfarin. He developed a blood clot and is treated with a thrombolytic agent.

- | | | |
|-----|--|------------|
| 2.1 | What are the different types of pharmacokinetics process which will be considered in this patient? | (10 marks) |
| 2.2 | Justify dose adjustments of anticoagulants in elderly patients. | (30 marks) |
| 2.3 | Justify the action of thrombolytic agent in clearing the blood clot. | (30 marks) |
| 2.4 | Compare and contrast the pharmacodynamic properties of heparin and low-molecular-weight heparins. | (30 marks) |

Question 03

(100 marks)

- | | | |
|-----|--|------------|
| 3.1 | List the contraindications of cholinergic drugs. | (10 marks) |
| 3.2 | Identify the drug or drugs used in the management of organophosphate poisoning and its mechanism of action. | (20 marks) |
| 3.3 | Differentiate between selective and non-selective beta blockers based on their pharmacological actions, giving one (01) example for each. | (30 marks) |
| 3.4 | Explain the mechanism of action of losartan and its therapeutic role in the management of hypertension. | (40 marks) |

Question 04

(100 marks)

- | | | |
|-----|--|------------|
| 4.1 | List the components of triple therapy used in the eradication of <i>Helicobacter pylori</i> in patients with peptic ulcer disease. | (10 marks) |
| 4.2 | List the common types of enemas. | (10 marks) |
| 4.3 | List the constituents of Oral Rehydration Solution (ORS). | (20 marks) |
| 4.4 | Describe the mechanism of action of loperamide. | (20 marks) |
| 4.5 | Justify "Omeprazole is formulated as an enteric-coated preparation". | (40 marks) |

Question 05**(100 marks)**

- 5.1 Differentiate between catecholamines and non-catecholamines. (20 marks)
- 5.2 Describe the mechanism of action of HMG Co-A reductase. (20 marks)
- 5.3 Classify the antiarrhythmic drugs into their major groups with one example for each group. (30 marks)
- 5.4 Explain the therapeutic uses of diuretics in clinical practice. (30 marks)

Question 06**(100 marks)**

- 6.1 A patient prescribed oral iron therapy requested an antacid for dyspepsia. Justify how the administration should be managed. (20 marks)
- 6.2 Explain the advices should be given to a patient prescribed with sublingual GTN. (20 marks)
- 6.3 Define,
 - 6.3.1 Dose response relationship (20 marks)
 - 6.3.2 Efficacy (20 marks)
 - 6.3.3 Potency (20 marks)

**Faculty of Health Sciences****Bachelor of Science Honors in Industrial Pharmaceutical Science/ Bachelor of Science Honors in Cosmetics Sciences****IPS 3124 Pharmaceutical Engineering I/ BCS 3143Cosmetic Technology I****Batch 06****3rd year 1st Semester - Mid Assignment**

Date: 30th of April 2025**Time: 1.30 pm – 2.30 pm (One hour)**

INSTRUCTIONS TO CANDIDATES

- This question paper consists of **TWO** questions.
- Answer **all** questions.
- You should write legibly in black or blue ink.

01.**(100 marks)**

1.1 Describe the significance of Bernoulli's theorem in pharmaceutical manufacturing. (50 marks)

1.2 How would you use Reynold's number of a fluid, to determine its flow regime? (50 marks)

02.**(100 marks)**

2.1 Outline the classification of centrifuges on their internal temperature. (50 marks)

2.2 A U-tube manometer measures the pressure in a pipe containing syrup. The manometer contains mercury (density = 13 600 kg/m³) and shows a height difference of 10 cm between the two columns. Calculate the pressure at the measuring point. (50 marks)



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Faculty of Health Sciences

**Bachelor of Science Honors in Industrial Pharmaceutical Science/ Bachelor of
Science Honors in Cosmetics Sciences**

IPS 3124 Pharmaceutical Engineering I/ BCS 3143Cosmetic Technology I

Batch 06

3rd year 1st Semester

End Semester Examination - SEQ

INDEX NUMBER:

Date: 30th of April 2025

Time: 9.00 am – 12.00 pm (Three hours)

INSTRUCTIONS TO CANDIDATES

- This question paper consists of **SIX** questions.
- Answer **all** questions.
- You should write legibly in black or blue ink.

01.

(100 marks)

1.1 State five (05) principles of material handling.

(10 marks)

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1.2 Classify the different types of solid material handling equipment, and give one (01) example for each type.

(30 marks)

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1.3 Write **three (03)** types of centrifugal fans used in gas handling systems, and include **three (03)** characteristics of each type. (30 marks)

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1.4 What are the **three (03)** key parameters that should be considered when selecting a fan for a gas handling system in an industrial setting. (30 marks)

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02. (100 marks)

2.1 State **four (04)** key factors need to be considered when selecting the material type for a pump. (10 marks)

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2.2 Compare and contrast the positive displacement pumps and dynamic (kinetic) pumps. (20 marks)

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2.3 Write an account on key parameters in pump selection. (40 marks)

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2.4 A pump is used to lift water to a height of 18 m. The density of water is $1.03 \times 10^3 \text{ kg/m}^3$ and the acceleration due to gravity is 9.8 m/s^2 :

2.4.1 What is the pressure required to pump water to this height. (10 marks)

2.4.2 Calculate the required power output if the flow rate is $0.06 \text{ m}^3/\text{s}$. (10 marks)

2.4.3 Determine the efficiency of the pump, assuming it consumes 30 kW of electrical power. (10 marks)

03.

(100 marks)

3.1 State **four (04)** mechanisms of filtration.

(10 marks)

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3.2 Differentiate between surface filtration and depth filtration.

(20 marks)

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3.3 Poiseuille's equation for filtration is expressed as below.

$$V = \frac{\pi r^4 \Delta P}{8 \eta L}$$

3.3.1 Write the terms of the Poiseuille's equation.

(10 marks)

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3.3.2 A liquid flows through a tube with a radius of 1 m and a length of 0.5 m. If the flow rate is 5 m³/s and the viscosity of the liquid is 0.432 Pa s., determine the pressure difference between the ends of the tube.

(20 marks)

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3.4 Write a short note on the construction of frame filter.

(40 marks)

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04.

(100 marks)

4.1 What is the difference between crystallization and precipitation?

(20 marks)

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4.2 Write a short note on the mechanism of crystallization.

(30 marks)

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4.3 State the advantages of Swenson-Walker crystallizer.

(30 marks)

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4.4. Write **five (05)** strategies to prevent caking.

(20 marks)

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05.

(100 marks)

5.1 State the **two (02)** main types of dehumidifier technology.

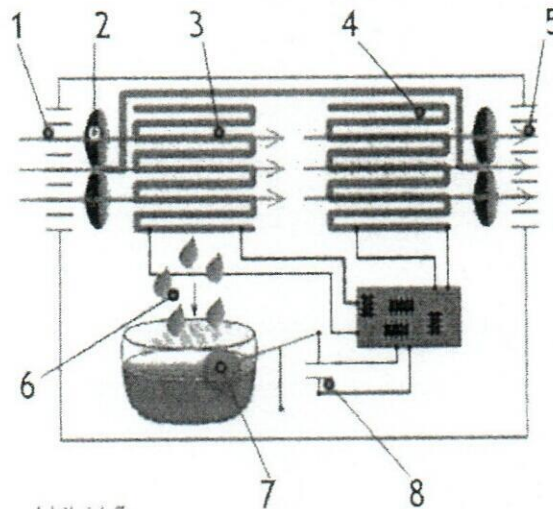
(10 marks)

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5.2 What is the working process of refrigeration-based dehumidifiers using the steps shown in the image below.

(30 marks)



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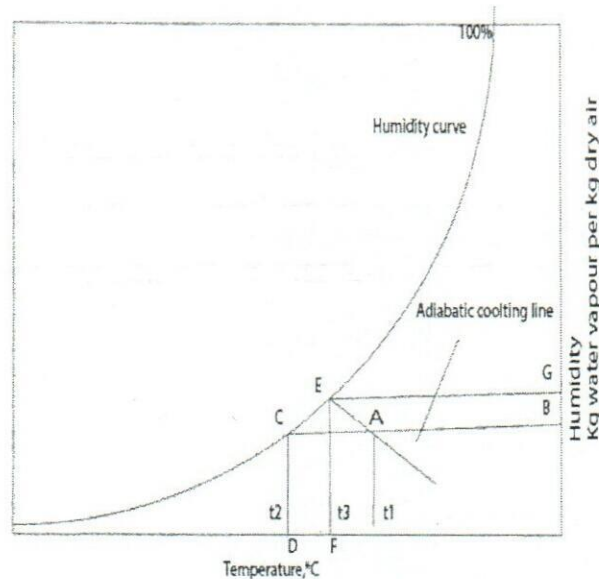
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5.3

5.3.1 Using the psychrometric chart below, identify the relevant points for humidity, dew point, and adiabatic saturation temperature. (10 marks)



5.3.2 Write down the dew point measurement method of humidity. (20 marks)

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5.4 State **five (05)** applications of humidity control in the pharmaceutical industry. (30 marks)

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06. (100 marks)

6.1 List **three (03)** types of sedimentation centrifuges. (15 marks)

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6.2 Outline the working principle of venturi meter.

(20 marks)

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6.3 Differentiate laminar flow and turbulent flow.

(30 marks)

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6.4 A cosmetic lotion is being pumped through a pipe with a diameter of 0.05 m at a velocity of 1 m/s. The lotion has a density of 950 kg/m^3 and a kinematic viscosity of $0.0002 \text{ m}^2/\text{s}$. Calculate the Reynolds number and determine the flow regime of this operation. (35 marks)

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Faculty of Health Sciences
B.Sc. (Hons) Biomedical Sciences/B.Sc. (Hons) Industrial Pharmaceutical Sciences/
B.Sc. (Hons) Cosmetic Science
Pharmacology I – BMS 3113/ IPS 3113/ BCS 3113
3rd year 1st Semester
End Semester SEQ Examination
6th Batch

INDEX NUMBER:

Date : 28th April 2025
Time : 9.00 a.m. – 12.00 p.m. (Three hours)

INSTRUCTIONS TO CANDIDATES

- This question paper consists of **SIX** questions.
- Answer **ALL** questions.
- You should write legibly in black or blue ink.
- You are not allowed to take out the examination papers.

Question 01

- 1.1. What is meant by ADME? (100 marks)
(20 marks)
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- 1.2 List the factors affecting the bioavailability of a drug. (30 marks)
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- 1.3 What is the first pass metabolism? (20 marks)
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- 1.4 List **two (02)** types of excretion kinetics. (20 marks)
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- 1.5. Why liver functions are important for drug usage? (10 marks)
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Question 02

(100 marks)

- 2.1 List components of triple therapy used in the eradication of *Helicobacter pylori* in patients with peptic ulcer disease. (30 Marks)

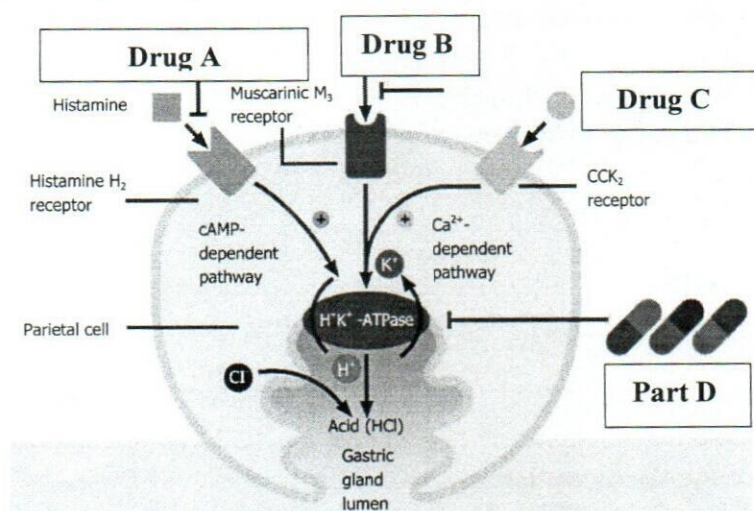
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- 2.2 Below is an image from a Parietal cell. (40 marks)

Identify the drug groups and name a drug which are labelled from A to D which can decreased gastric acid secretion.



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- 2.3 List an antacid which contains the both magnesium and aluminium metallic ion. Write **01 (one)** benefit of including both metallic ion in one drug. (20 marks)

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- 2.4 What is the purpose of omeprazole formulated as an enteric-coated capsule? (10marks)

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Question 03

(100 marks)

3.1 What is the mechanism of action of aminoglycosides?

(10 marks)

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3.2 Name **two (02)** drugs that belong to the aminoglycoside group.

(20 marks)

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3.3 List **two (02)** indications for the use of aminoglycosides.

(20 marks)

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3.4 What are **two (02)** important considerations during the administration of aminoglycosides?

(20 marks)

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3.5 List the first-line anti-tuberculosis (TB) drug regimen.

(30 marks)

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Question 04

(100 marks)

4.1 List the types of antiplatelet drugs.

(10 marks)

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4.2 Write the mode of action of one of the drugs in 2.1.

(20 marks)

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4.3 Justify the use of thrombotic agents in myocardial infarction. (20 marks)

4.4 What is INR? (10 marks)

4.5 State the differences of heparin and LMWH. (20 marks)

4.6 State the mode of action of heparin. (20 marks)

Question 05 (100 marks)

5.1 Why salbutamol is contraindicated in a patient with heart failure? (20 marks)

5.2 List **four (04)** types of drug classes used for cardiac arrhythmias, giving one example for each class. (20 marks)

5.3 List **three (03)** types of diuretics, giving one indication for each type. (30 marks)

5.4 List **two (02)** direct-acting cholinergic drugs. (20 marks)

5.5 State **one (01)** indication for the above two drugs.

(10 marks)

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Question 06

(100 marks)

6.1 Name **two (02)** clinical indications for parenteral nutrition.

(10 marks)

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6.2 Name **one (01)** example drug for the following given drug classes.

(15 marks)

6.2.1 Cephalosporins -

6.2.2 Tetracyclines -

6.2.3 Macrolides -

6.3 Compare bactericidal & bacteriostatic actions of drugs.

(25 marks)

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6.4 State the drug development process.

(50 marks)

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PAST PAPERS

Faculty	Department / Section/Division
Not Applicable	Learning Resource Centre

Past Papers

Faculty of Health Sciences

General Papers

(Year 3 – Semester I)

Document Control & Approving Authority	Senior Director – Quality Management & Administration
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1 st Issue Date: 2017.011.30	Revision No.00	Revision Date: 27.2.2024	Validated by: Librarian
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Faculty of Health Sciences
Bachelor of Science Honors in Industrial Pharmaceutical Science/ Bachelor of Science
Honors in Cosmetic Sciences
IPS 3124 - Pharmaceutical Engineering I/ BCS 3143 - Cosmaceutical Technology I
Batch 05
3rd year 1st Semester
End Semester Resit Examination - Assignment

INDEX NUMBER:

Date: 26th November 2024

Time: 1.30 pm – 2.30 pm (Three hours)

INSTRUCTIONS TO CANDIDATES

- This question paper consists of **TWO** questions.
- Answer **all** questions.
- You should write legibly in black or blue ink.

01.

(100 marks)

1.1. Classify gas handling systems.

(40 marks)

1.2. Draw a diagram of a centrifugal pump and describe its mechanism of action.

(60 marks)

02.

(100 marks)

2.1. Briefly describe the importance of humidity control in the pharmaceutical industry.

(50 marks)

2.2. Describe the construction of an industrial reverse osmosis plant by using a diagram.

(50 marks)



Faculty of Health Sciences
Bachelor of Science Honors in Industrial Pharmaceutical Science/ Bachelor of Science
Honors in Cosmetic Sciences
IPS 3124 - Pharmaceutical Engineering I/ BCS 3143 - Cosmaceutical Technology I
Batch 05
3rd year 1st Semester
End Semester Resit Examination SEQ

INDEX NUMBER:

Date: 26th November 2024

Time: 9.00 am – 12.00 pm (Three hours)

INSTRUCTIONS TO CANDIDATES

- This question paper consists of **SIX** questions.
- Answer **all** questions.
- You should write legibly in black or blue ink.

01. (100 marks)

1.1.

1.1.1. What is the difference between normal stress and shear stress? (20 marks)

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1.1.2. Write **two (02)** applications of fluids flow in the pharmaceutical industry. (20 marks)

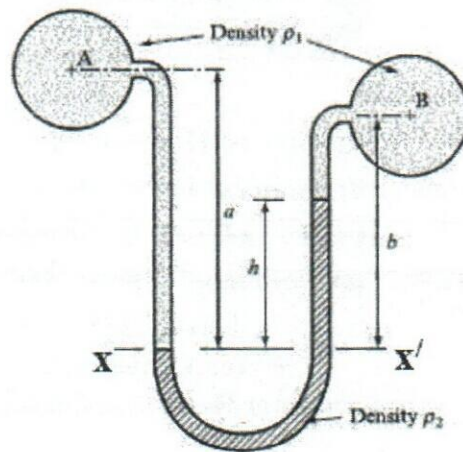
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1.2.A U-tube manometer measures the pressure difference between two points A and B in a liquid with density ρ_1 . The U-tube contains mercury with density ρ_2 .



1.2.1. Write an equation for $P_{XX'}$ considering left hand side limb.

(20 marks)

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1.2.2. Write an equation for $P_{XX'}$ considering right hand side limb.

(20 marks)

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1.2.3. Calculate the difference of pressure if $a = 1.5$ m, $b = 0.5$ m and $h = 0.75$ m if the liquid at A and B is water ($\rho_1 = 1000$ kg/m³) and $\rho_2 = 13.6 \rho_1$.

(20 marks)

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2.3. What is the importance of using "Pressure relief valves" in the pharmaceutical industry?

(30 marks)

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03.

(100 marks)

3.1. Write **five (05)** factors influencing the filtration rate.

(20 marks)

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3.2. State **four (04)** characteristics of filter aids.

(20 marks)

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3.3.

3.3.1. What is a filter media?

(10 marks)

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3.3.2. State **four (04)** reasons for not using asbestos pads frequently as a filter media.

(20 marks)

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3.4. What is the purpose of using membrane filters to prepare sterile solution? (30 marks)

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04. (100 marks)

4.1. What is a material handling system? (20 marks)

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4.2. State **four (04)** types of solid handling systems. (20 marks)

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4.3. Write **three (03)** reasons to use pneumatic conveying systems rather than the other alternatives? (30 marks)

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4.4. Write a short note on the mechanism of action of a piston pump. (30 marks)

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05.

(100 marks)

5.1. State **three (03)** humidity measurement methods.

(15 marks)

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5.2. Inside the manufacturing facility of the pharmaceutical plant recommended RH range is 40 % - 60%. The following table shows the wet bulb and dry bulb readings at two different stages.

1.

Dry bulb reading	54 °F
Wet bulb reading	63 °F

2.

Dry bulb reading	70 °F
Wet bulb reading	68°F

5.2.1. Find relative humidity values from the psychrometric chart related to the above two stages.
(20 marks)

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5.2.2. Comment on the above two stages separately concerning the ability to run a production Process.
(20 marks)

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5.2.3. If there is an issue in environmental conditions at one of the above stages, what is the decision you can make as the production executive to carry out the production process correctly?
(20 marks)

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5.3. Write the mechanism of action of the HVAC unit by using a diagram.

(25 marks)

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06.

(100 marks)

6.1. State **three (03)** types of rotors available in basic centrifuge machines.

(15 marks)

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6.2. State the types of sedimentation centrifuges.

(15 marks)

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6.3. What is crystal caking?

(30 marks)

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6.4. State how a continuous crystallizer is different from a batch crystallizer.

(40 marks)

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