



PAST PAPERS

<i>Faculty</i>	<i>Department / Section/Division</i>
<i>Not Applicable</i>	<i>Learning Resource Centre</i>

Past Papers

Faculty of health science

**Bachelor of Science honours in Industrial
Pharmaceutical Sciences**

Year 2 – Semester II

<i>Document Control & Approving Authority</i>	<i>Senior Director – Quality Management & Administration</i>
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<i>1st Issue Date: 2017.011.30</i>	<i>Revision No.00</i>	<i>Revision Date: 12.01.2023</i>	<i>Validated by: Librarian</i>
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Faculty of Health Sciences
BACHELOR OF SCIENCE HONOURS IN INDUSTRIAL PHARMACEUTICAL SCIENCES / BACHELOR OF SCIENCE HONOURS IN COSMETIC SCIENCES
IPS 2243/ BCS 2243 INORGANIC CHEMISTRY
BATCH 05- 2ND YEAR 2ND SEMESTER-END SEMESTER SEQ EXAMINATION
Date: 11th of May 2023
Time: 09.00 am – 12.00 pm - Three Hours
INSTRUCTIONS TO CANDIDATES Page

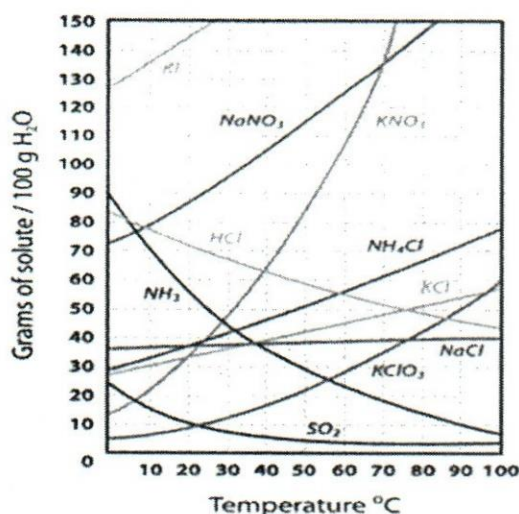
- This question paper consists of **SIX** questions.
- Answer **ALL** questions.
- You should write legibly in black or blue ink.

Question 01
(100 marks)

- 1.1 Co, Pt, Mn are commonly used as catalysts. Explain this statement. (20 marks)
- 1.2 Explain why many d-block elements are colored. (20 marks)
- 1.3 Explain why the size of the alkali metals increase when moving down the group. (20 marks)
- 1.4 Group 16 elements have the valence electron shell structure ns^2np^4 . Explain the trends in atomic properties such as Atomic radii, Ionization enthalpy, Electronegativity, Melting and boiling point trends in Group 16. (40 marks)

Question 02
(100 marks)

- 2.1 Define Metallic bonds, Ionic bonds & Covalent bonds. (30 marks)
- 2.2 Explain the difference between homogeneous mixtures and heterogeneous mixtures. (20 marks)
- 2.3 Following figure shows how solubility of the compounds change with temperature.



2.3.1.1 Amount of 50 grams of KNO_3 at 50°C

2.3.1.2 Amount of 100 grams of NaNO_3 at 80°C

2.3.2 Which solid has the highest solubility at 30°C ?

(10 marks)

2.3.3 A mass of 90 grams of KNO_3 is placed in 100ml of water at 40°C .

2.3.3.1 Will the solution be saturated?

If the answer is yes, how much KNO_3 will remain undissolved at the bottom of the container?

If the answer is no, how much more KNO_3 could be dissolved? (10 marks)

2.3.3.2 If the solution is heated to 70°C will it be saturated? If the answer is yes, how much KNO_3 will be undissolved at the bottom of the container? If the answer is no, how much more KNO_3 could be dissolved? (10 marks)

2.3.3.3 If the solution is cooled to 20°C will it be saturated? If the answer is yes, how much KNO_3 will be undissolved at the bottom of the container? If the answer is no, how much more KNO_3 could be dissolved? (10 marks)

Question 03

(100 marks)

3.1 Explain why noble gases are generally unreactive and do not form chemical bonds with other elements.

(20 marks)

3.2 Briefly explain the process of isolating noble gases from air. Include the properties of the noble gases that make this process possible.

(25 marks)

3.3 State four direct applications of noble gases in medicine.

(20 marks)

3.4 Briefly explain how XeF_4 is prepared including the chemical reactions and conditions?

(20 marks)

3.5 Give three examples of how noble gases are used to create an inert atmosphere?

(15 marks)

Question 04

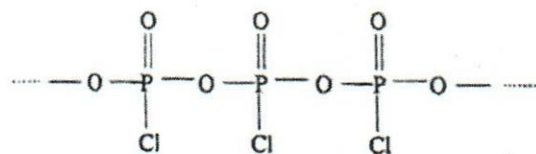
(100 marks)

4.1 What types of reactions are involved in the formation of polymers?

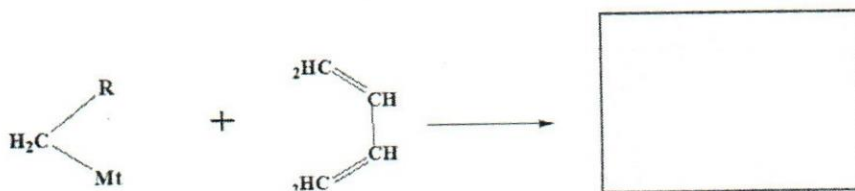
(10 marks)

4.2 Starting from PCl_5 , using relevant reactions and conditions, illustrate the formation of the following linear long chain polymer.

(20 marks)



4.3 What is the resulting monomer catalyst complex when an organometallic catalyst is combined with following diene monomer? (10 marks)



4.4 Mention four properties of silicones?

(20 marks)

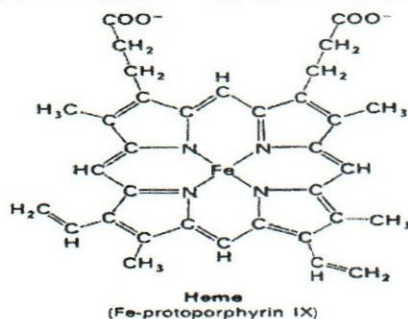
4.5 Briefly explain how do the mentioned properties of silicones make them useful in various applications?

(40 marks)

Question 05

(100 marks)

5.1 Answer the following questions based on the heme molecule which is a subunit of the hemoglobin molecule.



- 5.1.1 Write the metal ion present in this molecule and state whether it's bulk or a trace metal. (10 marks)
- 5.1.2 Write the oxidation state of the metal ion. (10 marks)
- 5.1.3 Oxygen transport of the haemoglobin molecule ceased due to the presence of oxidants. Briefly explain the reason. (20 marks)
- 5.1.4 Explain the structural difference between the haemoglobin and myoglobin molecule. (30 marks)
- 5.2 Briefly explain the properties of water and how it's beneficial to the biological systems (30 marks)

Question 06

(100 marks)

6.1 The questions are based on the following metals.

Na, Mg, Ca, K, Fe, Co, Ni, Zn, Cu, Cd, Hg, Mo, Pb

- 6.1.1 State the metal which is needed for blood clotting mechanism. (5 marks)
- 6.1.2 State two metals that are important to maintaining the osmotic pressure in cells. (5 marks)
- 6.1.3 Name the metal that is present in chlorophyll a. (5 marks)
- 6.1.4 Name the metal ion that is responsible for the active site of the urease enzyme. (5 marks)
- 6.1.5 Name the metal that is transported by ceruloplasmin protein. (5 marks)
- 6.1.6 Write the metal that is responsible for inhibiting heme synthase enzyme in red blood cells. (5 marks)
- 6.1.7 Name the metal that is responsible for forming the amalgam used to fill teeth. (5 marks)
- 6.1.8 State the metal that is present in vitamin B₁₂ (5 marks)
- 6.1.9 Name the metal that is present in the nitrogenase enzyme. (5 marks)
- 6.1.10 State the metal present in the porphyrin ring of heme. (5 marks)
- 6.2 Mercury is classified as a toxic metal for biological systems, and it can inhibit enzymes by binding to the donor atoms in the enzyme.
- 6.2.1 Draw the dose response curve for the mercury. (Tolerance range for Hg is 5µg/L) (20 marks)
- 6.2.2 State two exposure routes for mercury. (10 marks)
- 6.2.3 Briefly explain the toxicity of ionic mercury and alkyl mercury based on their solubility. (20 marks)

FACULTY OF HEALTH SCIENCES
BACHELOR OF SCIENCE HONOURS IN INDUSTRIAL PHARMACEUTICAL SCIENCES
 IPS 2233 - INDUSTRIAL PHARMACEUTICS I
 BATCH 05- 2ND YEAR 2ND SEMESTER -END SEMESTER SEQ EXAMINATION

Date : 04th May 2023
Time : 09.00 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.
- You are allowed to use non-programmable calculators.

Question 01

(100 marks)

- 1.1. State the information available in following chapters of British Pharmacopoeia. (20 marks)
- 1.1.1. General Notices
 - 1.1.2. Infrared Reference Spectra
 - 1.1.3. Appendices
 - 1.1.4. Supplementary Chapters
- 1.2. Write a descriptive account on main information sources available in field of pharmacy. (30 marks)
- 1.3. Briefly explain why tablet binders are necessary for granulation. (20 marks)
- 1.4. During the manufacturing process of the tablet "X" the following excipients are added. Mention the use of each excipient in the formulation of tablet "X". (30 marks)
- 1.4.1. Starch
 - 1.4.2. Microcrystalline cellulose
 - 1.4.3. Polyethylene glycol
 - 1.4.4. Magnesium stearate
 - 1.4.5. Titanium dioxide

Question 02

(100 marks)

- 2.1. State **05** powder particle size analysis methods used in pharmaceutical industry. (25 marks)
- 2.2. Briefly explain the importance and method of "geometric dilution" used in blending powders. (25 marks)
- 2.3. List **03** methods used in preparation of granules. (15 marks)
- 2.4. Discuss the advantages and disadvantages of powder as a dosage form. (35 marks)

Question 03

(100 marks)

- 3.1. Write **05** desirable properties of an appropriate ointment base. (25 marks)
- 3.2. Describe the preparation of ointments by fusion method. (30 marks)
- 3.3. State **05** advantages of rectal route of drug administration over oral route. (15 marks)
- 3.4. Write short notes on the following.

3.4.1. Physicochemical factors affecting for the drug absorption from rectal suppositories.

(15 marks)

3.4.2. Preparation of suppositories by molding method.

(15 marks)

Question 04**(100 marks)**

4.1. List **04** types of bases used in the development of the cream formulations.

(10 marks)

4.2. Briefly explain how the pH of a drug affect the physiochemical properties of a drug.

(25marks)

4.4. Outline the process of preparing a pharmaceutical cream.

(30 marks)

4.5. "Preservatives are substances that are added to formulations to prolong their shelf life". Explain this statement giving appropriate examples.

(35 marks)

Question 05**(100 marks)**

5.1. Outline the steps of the capsule filling process.

(30 marks)

5.2. List the limitations of using soft gelatin capsules.

(10 marks)

5.3. Briefly explain why gelatin is considered as the suitable excipient in the manufacturing of the capsules.

(25 marks)

5.4. Drug Z has a pKa value of 5.5. If the patient takes the tablets 30 minutes after the diet determine the site of absorption of the drug Z. Consider the pH of the stomach is 6.7 and pH of the small intestine is 4.2.

(35 marks)

Question 06**(100 marks)**

6.1. List the methods used to manufacture tablets using dry granulation method.

(10 marks)

6.2. Briefly explain the processes mentioned in 6.1.

(25 marks)

6.3. Mention **04** method used to improve the solubility of drug molecules.

(20 marks)

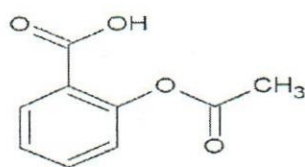
6.4. State **02** applications of multiple compressed tablets.

(25 marks)

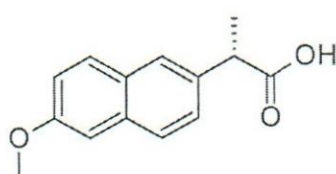
6.5. Three compounds below shows the non-steroidal anti-inflammatory drugs. Calculate their water solubility and arrange them in the ascending order of water solubility.

(20 marks)

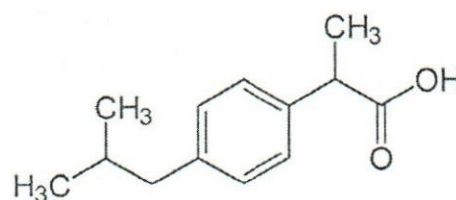
Aspirin



Naproxen



Ibuprofen



Functional group	Monofunctional Molecule	Polyfunctional Molecule
Alcohol	5 to 6 carbons	3 to 4 carbons
Phenol	6 to 7 carbons	3 to 4 carbons
Ether	4 to 5 carbons	2 carbons
Aldehyde	4 to 5 carbons	2 carbons
Ketone	5 to 6 carbons	2 carbons
Amine	6 to 7 carbons	3 carbons
Carboxylic acid	5 to 6 carbons	3 carbons
Ester	6 carbons	3 carbons
Amide	6 carbons	2 to 3 carbons
Urea, Carbonate, carbamate	2-3	2 carbons

FACULTY OF HEALTH SCIENCES
BACHELOR OF SCIENCE HONOURS IN INDUSTRIAL PHARMACEUTICAL SCIENCES
IPS 2233 - INDUSTRIAL PHARMACEUTICS I
BATCH 05- 2ND YEAR 2ND SEMESTER -END SEMESTER SEQ EXAMINATION

Date : 04th May 2023
Time : 09.00 am – 12.00 pm (Three Hours)

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(15 marks)

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(15 marks)

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4.1. List **04** types of bases used in the development of the cream formulations.

(10 marks)

4.2. Briefly explain how the pH of a drug affect the physiochemical properties of a drug.

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(30 marks)

4.5. "Preservatives are substances that are added to formulations to prolong their shelf life". Explain this statement giving appropriate examples.

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Question 05**(100 marks)**

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(30 marks)

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(35 marks)

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6.1. List the methods used to manufacture tablets using dry granulation method.

(10 marks)

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(25 marks)

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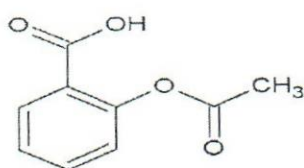
6.4. State **02** applications of multiple compressed tablets.

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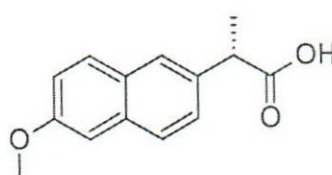
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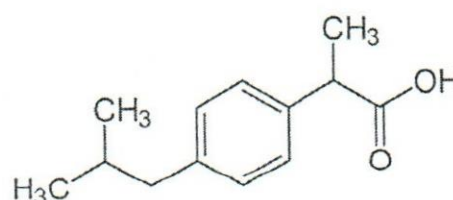
Aspirin



Naproxen



Ibuprofen



Functional group	Monofunctional Molecule	Polyfunctional Molecule
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Phenol	6 to 7 carbons	3 to 4 carbons
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Aldehyde	4 to 5 carbons	2 carbons
Ketone	5 to 6 carbons	2 carbons
Amine	6 to 7 carbons	3 carbons
Carboxylic acid	5 to 6 carbons	3 carbons
Ester	6 carbons	3 carbons
Amide	6 carbons	2 to 3 carbons
Urea, Carbonate, carbamate	2-3	2 carbons



Faculty of Health Sciences

Bachelor of Science Honours in Industrial Pharmaceutical Sciences

IPS2223 – Biochemistry II

Batch - 01

2nd Year 2nd Semester

End semester SEQ Online Examination

INDEX NUMBER:

Date : 03rd May 2021
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 answers in lined papers** legibly in black or blue ink.
- You **MUST** write your **index number in the top right corner** of each answer script.
- **Answer script should be numbered** (right bottom) clearly.
- Photograph of your answer scripts must be taken by keeping them on a clear platform (e.g. table).
- Arrange the photographs of your answer script in a word document in an orderly manner, then convert the word document to a PDF.
- **Label the PDF: Your Index No-Biochemistry II.**
- **Upload** the labelled **PDF to LMS AND** also **email** the PDF to Fohs.exams@cinec.edu

1.
 - 1.1. State the chemical bonds that stabilize the tertiary structure of proteins. (20 marks)
 - 1.2. Describe the structure of alfa helix of proteins. (30 marks)
 - 1.3. State two super secondary structures of proteins and describe the structure. (50 marks)
2.
 - 2.1 Differentiate nucleotides and nucleosides. (20 marks)
 - 2.2 Discuss the features of double helical structure of DNA. (80 marks)
3.
 - 3.1. Give an account of metabolic adaptation by body during prolonged starvation with reference to carbohydrates, lipids and proteins. (75 marks)
 - 3.2. Discuss the role of Cortisol hormone in regulation of fuel metabolism. (25 marks)
4.
 - 4.1. Describe the three main steps which nitrogen gets removed from the circulation. (40 marks)
 - 4.2. Describe how ammonia is detoxified in the liver. (40 marks)
 - 4.3. Discuss the biochemical complications arise due to accumulation of phenylalanine. (20 marks)
5.
 - 5.1. Discuss the importance of phosphoribosyl transferases (PRTs) in both *de novo* and salvage pathways of nucleotides anabolism. (30 marks)
 - 5.2. Outline the structural feature of messenger RNA (mRNA). (40 marks)
 - 5.3. Describe the biochemical consequences of Glucose-6-Phosphatase deficiency that results in gout. (30 marks)
6. Write short notes on following.
 - 6.1. Buffering mechanism of phosphate buffer. (35 marks)
 - 6.2. Glucogenic and ketogenic amino acids. (30 marks)
 - 6.3. Phenylketonuria (PKU) associated hypopigmentation. (35 marks)



Faculty of Health Sciences
Bachelor of Science Honours in Industrial Pharmaceutical Science
IPS 2243 - Inorganic Chemistry
Batch - 02
2nd year 2nd semester
End Semester SEQ Examination

INDEX NUMBER:

Date : 27th January 2022
Time : 09.00 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.
- You are not allowed to take out the examination papers.

MATERIALS REQUIRED

- You may use a scientific calculator. This must not be programmable and may be inspected during the examination. Programmable calculators, PDAs and mobile phones are not permitted in the examinations.

01 (100 marks)

- 1.1. Briefly describe the solvation process using NaCl as an example. (15 marks)
- 1.2. State 03 colligative properties of a solution. (15 marks)
- 1.3. Considering alkali metals, second ionization enthalpies are very high as compare with the respective first ionization enthalpies. Justify this statement. (20 marks)
- 1.4. Comment on why tendency to show catenation of carbon family elements decreases down the group. (20 marks)
- 1.5. Discuss the properties and reactivity of alkali metal oxides with water. Your answer should include possible chemical reactions. (30 marks)

02 (100 marks)

- 2.1. Draw the Lewis dot structure for following molecules. (25 marks)
- a. HCl
 - b. BF_3
 - c. NH_3
 - d. CHCl_3
 - e. H_2S
- 2.2. Describe the propertied of ionic bonds. (20 marks)
- 2.3. What are the differences between polar covalent bonds and nonpolar covalent bonds? (20 marks)
- 2.4. Discuss how hydrogen bonds are important to sustain the life. (35 marks)

03 (100 marks)

- 3.1. Why is Helium used for superconducting magnets in NMR spectrometers? (20 marks)
- 3.2. "Xenon can be oxidized by a powerful oxidizing agent" (30 marks)
- a. What is the reason behind the above statement?
 - b. Justify the above statement with relevant chemical reactions.
- 3.3. Write the balanced chemical reaction for the preparation of Diisopropyldichlorosilane, via grignard reagent. (10 marks)
- 3.4. Write the structure of the cyclic trimer that you would obtain from the polymerization between dimethyl dihydroxy silane. (10 marks)
- 3.5. Discuss the preparation, properties, and uses of silicone fluids/oils. (30 marks)

04

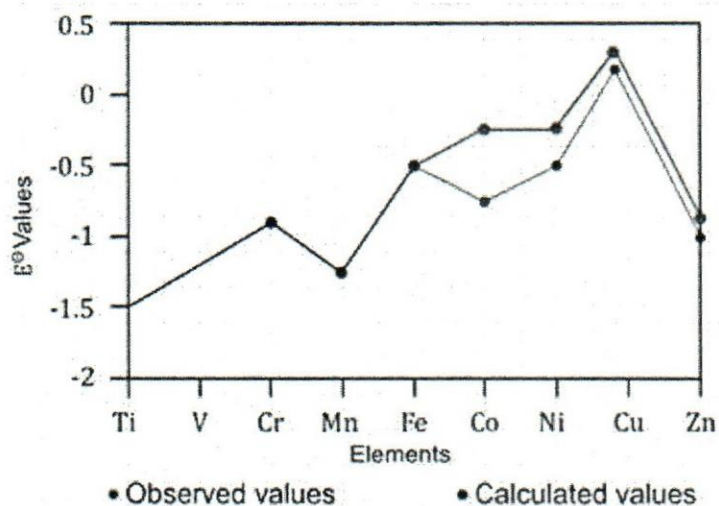
(100 marks)

- 4.1. Categorize the biologically important elements and give 4 examples for each category. (20 marks)
- 4.2. State the clinical disorders related to the deficiency of Ca, Zn, F, Fe, Mg. (20 marks)
- 4.3. Describe the chemical structure and the importance of ATP in human body. (25 marks)
- 4.4. Describe the chemical importance of sodium and potassium elements in ATPase pump using a diagram. (35 marks)

05

(100 marks)

- 5.1. State the difference between diamagnetic and paramagnetic. (10 marks)
- 5.2. What is meant by disproportionation of an oxidation state? Give an example. (15 marks)
- 5.3.



Above graph shows the trends in M^{2+} / M standard electrode potentials of 3d series of transition elements. Based on this graph, comment on the reducing ability of element Cu with the presence of HCl acid and HNO_3 acid separately. Use balance chemical equations when necessary. (20 marks)

- 5.4. Describe how Fe^{3+} ion provides the catalyst activity in a chemical reaction. (20 marks)
- 5.5. Variation in atomic radii decreases across the 3d series while increases from 3d series to the 4d series of transition elements. Justify this statement. (35 marks)

06**(100 marks)**

- 6.1. What is the application of bioinorganic chemistry? (15 marks)
- 6.2. Differentiate the chemical structure of hemoglobin and myoglobin. (30 marks)
- 6.3. What is biomagnification? (10 marks)
- 6.4. Write short notes on the effect of following elements on humans. (45 marks)
- a. Arsenic
 - b. Cadmium
 - c. Lead



CINE Campus (Pvt) Ltd

Approved for Quality Management System

Faculty of Health Sciences

Bachelor of Science Honours in Industrial Pharmaceutical Sciences

IPS 2243/ BCS 2243 Inorganic Chemistry

Batch 04

2nd year 2nd semester

End Semester SEQ Examination

INDEX NUMBER: IPS/2243/02/04/01.....

Date: 01st of September 2022

Time: 09.00 am – 12.00 pm - Three Hours

INSTRUCTIONS TO CANDIDATES

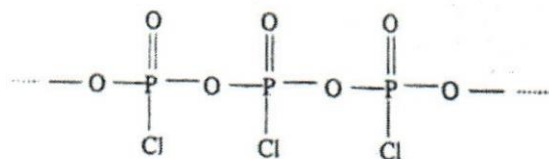
- This question paper consists of **SIX** questions.
- Answer **ALL** questions.
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Question 01.**(100 marks)**

- 1.1 Indicate how would you isolate/ separate the following noble gases. (20 marks)
- Argon
 - Helium
- 1.2 "The lighter gases come out first followed by the heavier ones during the fractional distillation." Briefly comment on the above statement. (20 marks)
- 1.3 State the preparation method of following compounds. (Your answer must consist of relevant chemical equation/s as well). (30 marks)
- Xenon tetrafluoride (XeF_4)
 - Xenon trioxide (XeO_3)
- 1.4 Indicate 03 important medical applications of noble gases. (30 marks)

Question 02.**(100 marks)**

- 2.1 Indicate 03 types of polymers formed due to three different reaction types. (15 marks)
- 2.2 Starting from PCl_5 , using relevant reactions and conditions, illustrate the formation of the following linear long chain polymer. (25 marks)



- 2.3 Describe how would you obtain straight chain $\text{R}_3\text{Si-O-SiR}_3$ (dimer), from the reaction between the Grignard reagent and silicon tetra chloride. (You must use all necessary reactions, conditions, and steps involved in this production) (35 marks)
- 2.4 Depending on the degree of polymerization silicones are classified into 05 types. Indicate those 05 types of silicones and an application for each type. (25 marks)

Question 03.**(100 marks)**

- 3.1 List down 03 examples of heavy metals that are harmful to the human body and 02 examples of heavy metals that are essential in small amounts and toxic in larger quantities. (15 marks)
- 3.2 Except **Dimercaprol (BAL)**, indicate any 03 chelating agents used in the treatment of heavy-metal poisoning. (15 marks)
- 3.3 Dimercaprol (BAL, British anti-Lewisite) is a chelating agent used as an antidote for arsenic, antimony, bismuth, gold, and mercury poisoning. It has the chemical name 2,3-dimercapto-1-propanol and is a clear, colourless or slightly yellow liquid.
- a. Describe how BAL act as a chelating agent in removing heavy metals from the body. (30 marks)
- b. What is the solvent used in BAL formulation? (10 marks)
- 3.4 Describe the conditions for essentiality in essential elements in human body. (30 marks)

Question 04.**(100 marks)**

- 4.1 Write 05 bioactive substances containing metals and their respective function in the human body. (Your answer should include the name of the substance, metal contained in the particular substance, and function of the substance) (20 marks)
- 4.2 Indicate 03 reasons why have certain elements been "selected" for use in biological systems. (20 marks)
- 4.3 Briefly describe the following statements with respect to the evolution of biological roles for essential metals. (30 marks)
- a. Biologically, Molybdenum (Mo) has been utilized more rather than Chromium (Cr).
- b. Cobalt (Co) has been given an essential role in cobalamins despite its very low availability.
- 4.4 What are the main types of chemical interactions and give two examples for each? (30 marks)

Question 05.

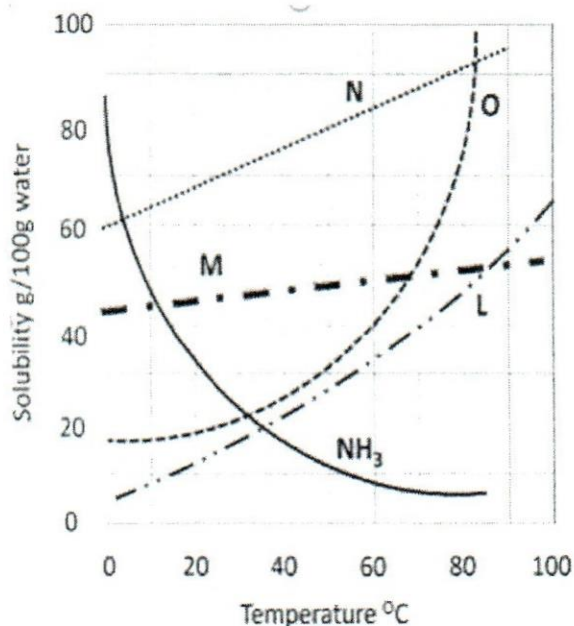
(100 marks)

- 5.1 Describe why Cs has the lowest first ionization energy in the Group 1 of the periodic table. Comment on the electropositivity of the cations as you go down the Group. (20 marks)
- 5.2 Group 15 elements have the valence electron shell structure ns^2np^3 . Explain the trends in atomic properties such as Atomic radii, Ionization enthalpy, Electronegativity, Melting and boiling point trends in Group 15. (30 marks)
- 5.3 When comparing with most D block elements, Zn has a lower melting point. Explain (20 marks)
- 5.4 All D block elements are not transition elements. Explain and support this statement by giving examples (30 marks)

Question 06.

(100 marks)

- 6.1 The solubility curves for Ammonia and 4 solids, L, M, N and O, are shown for the temperature range 0 °C to 100 °C. The solubility is given in grams of the solid that will dissolve in 100 grams of water.



- 6.1.1 For each question, select from the graph the letter L, M, N and O, that represents the solid described.

- a. Which solid has the highest solubility at 50 °C? (20 marks)

- b. Which solid has the same solubility as Ammonia at 12 °C? (20 marks)
- c. Which solid has a solubility that changes least with temperature? (20 marks)
- d. Which solid would give a deposit of 40 g if a saturated solution in 100 g of water at 80 °C was cooled to 60 °C? (20 marks)
- 6.1.2. How many grams of M solid can be dissolved in 300g of water at 80 °C? (20 marks)



CINE Campus (Pvt) Ltd

Approved for Quality Management System

Faculty of Health Sciences

Bachelor of Science Honours in Industrial Pharmaceutical Sciences

IPS 2243/ BCS 2243 Inorganic Chemistry

Batch 04

2nd year 2nd semester

End Semester SEQ Examination

INDEX NUMBER:

Date: 01st of September 2022

Time: 09.00 am – 12.00 pm - Three Hours

INSTRUCTIONS TO CANDIDATES

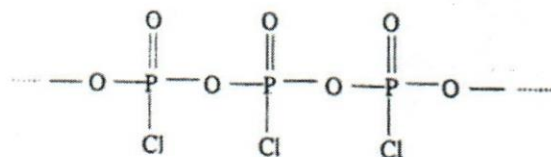
- This question paper consists of **SIX** questions.
- Answer **ALL** questions.
- You should write legibly in black or blue ink.
- You are not allowed to take out the examination papers.

Question 01.**(100 marks)**

- 1.1 Indicate how would you isolate/ separate the following noble gases. (20 marks)
- Argon
 - Helium
- 1.2 "The lighter gases come out first followed by the heavier ones during the fractional distillation." Briefly comment on the above statement. (20 marks)
- 1.3 State the preparation method of following compounds. (Your answer must consist of relevant chemical equation/s as well). (30 marks)
- Xenon tetrafluoride (XeF_4)
 - Xenon trioxide (XeO_3)
- 1.4 Indicate 03 important medical applications of noble gases. (30 marks)

Question 02.**(100 marks)**

- 2.1 Indicate 03 types of polymers formed due to three different reaction types. (15 marks)
- 2.2 Starting from PCl_5 , using relevant reactions and conditions, illustrate the formation of the following linear long chain polymer. (25 marks)



- 2.3 Describe how would you obtain straight chain $\text{R}_3\text{Si-O-SiR}_3$ (dimer), from the reaction between the Grignard reagent and silicon tetra chloride. (You must use all necessary reactions, conditions, and steps involved in this production) (35 marks)
- 2.4 Depending on the degree of polymerization silicones are classified into 05 types. Indicate those 05 types of silicones and an application for each type. (25 marks)

Question 03.**(100 marks)**

- 3.1 List down 03 examples of heavy metals that are harmful to the human body and 02 examples of heavy metals that are essential in small amounts and toxic in larger quantities. (15 marks)
- 3.2 Except **Dimercaprol (BAL)**, indicate any 03 chelating agents used in the treatment of heavy-metal poisoning. (15 marks)
- 3.3 Dimercaprol (BAL, British anti-Lewisite) is a chelating agent used as an antidote for arsenic, antimony, bismuth, gold, and mercury poisoning. It has the chemical name 2,3-dimercapto-1-propanol and is a clear, colourless or slightly yellow liquid.
- a. Describe how BAL act as a chelating agent in removing heavy metals from the body. (30 marks)
- b. What is the solvent used in BAL formulation? (10 marks)
- 3.4 Describe the conditions for essentiality in essential elements in human body. (30 marks)

Question 04.**(100 marks)**

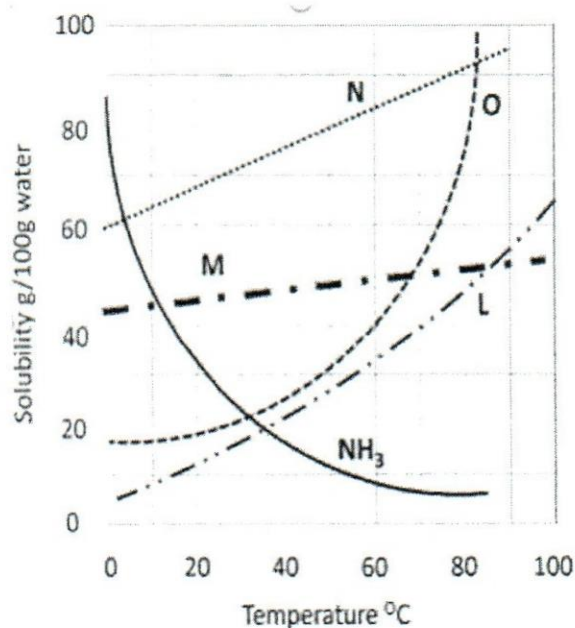
- 4.1 Write 05 bioactive substances containing metals and their respective function in the human body. (Your answer should include the name of the substance, metal contained in the particular substance, and function of the substance) (20 marks)
- 4.2 Indicate 03 reasons why have certain elements been "selected" for use in biological systems. (20 marks)
- 4.3 Briefly describe the following statements with respect to the evolution of biological roles for essential metals. (30 marks)
- a. Biologically, Molybdenum (Mo) has been utilized more rather than Chromium (Cr).
- b. Cobalt (Co) has been given an essential role in cobalamins despite its very low availability.
- 4.4 What are the main types of chemical interactions and give two examples for each? (30 marks)

Question 05.**(100 marks)**

- 5.1 Describe why Cs has the lowest first ionization energy in the Group 1 of the periodic table. Comment on the electropositivity of the cations as you go down the Group. (20 marks)
- 5.2 Group 15 elements have the valence electron shell structure ns^2np^3 . Explain the trends in atomic properties such as Atomic radii, Ionization enthalpy, Electronegativity, Melting and boiling point trends in Group 15. (30 marks)
- 5.3 When comparing with most D block elements, Zn has a lower melting point. Explain (20 marks)
- 5.4 All D block elements are not transition elements. Explain and support this statement by giving examples (30 marks)

Question 06.**(100 marks)**

- 6.1 The solubility curves for Ammonia and 4 solids, L, M, N and O, are shown for the temperature range 0 °C to 100 °C. The solubility is given in grams of the solid that will dissolve in 100 grams of water.



- 6.1.1 For each question, select from the graph the letter L, M, N and O, that represents the solid described.

- a. Which solid has the highest solubility at 50 °C? (20 marks)

- b. Which solid has the same solubility as Ammonia at 12 °C? (20 marks)
- c. Which solid has a solubility that changes least with temperature? (20 marks)
- d. Which solid would give a deposit of 40 g if a saturated solution in 100 g of water at 80 °C was cooled to 60 °C? (20 marks)
- 6.1.2. How many grams of M solid can be dissolved in 300g of water at 80 °C? (20 marks)

00002



Faculty of Health Sciences

**Bachelor of Science Honours in Industrial Pharmaceutics Science/
Bachelor of Science Honours in Cosmetic Science**

**IPS 2253/ BCS 2253 Pathology of Diseases/ Pathology for Cosmetic Science
2nd Year 2nd Semester**

End Semester SEQ Examination

4th Batch

INDEX NUMBER:

Date : 30th August 2022
Time : 09,00 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 1 (100 marks)

1.1 Define following terms.

- 1.1.1. Hypertrophy (15 marks)
 1.1.2. Hyperplasia (15 marks)
 1.1.3. Atrophy (15 marks)
 1.1.4. Metaplasia (15 marks)

1.2 Compare followings.

- 1.2.1 Acute inflammation and Chronic inflammation (20 marks)
 1.2.2 Benign tumors and Malignant tumours (20 marks)

Question 2 (100 marks)

- 2.1 Describe different types of necrosis including examples. (40 marks)
 2.2 Compare primary union and secondary union. (25 marks)
 2.3 Describe the importance of inflammation. (35 marks)

Question 3 (100 marks)

3.1 Describe the pathological changes in following stages of lobar pneumonia.

- 3.1.1 Congestion (15 marks)
 3.1.2 Red Hepatisation (15 marks)
 3.1.3 Gray Hepatisation. (15 marks)
 3.1.4 Stage of Resolution (15 marks)

3.2 Write short note on followings.

- 3.2.1 Emphysema (20 marks)
 3.2.2 Components in atherosclerotic plaques (20 marks)

Question 4 (100 marks)

- 4.1 List three diseases associate with the oesophagus. (15 marks)
 4.2 Write the major differences between Ulcerative colitis and Crohn's disease. (25 marks)
 4.3 What is villous adenoma? (25 marks)
 4.4 List three factors for hyperpituitarism (15 marks)
 4.5 Write a short note on goiter. (20 marks)

Question 5 (100 marks)

5.1 Complete following table.

	Site	Causes
Epidural haemorrhages	5.1.1 (10 marks)	5.1.2 (10 marks)
Subdural haemorrhages	5.1.2 (10 marks)	5.1.4 (10 marks)

- 5.2 Write a short note on hydrocephalus. (25 marks)
 5.3 Describe pathological changes in different stages of cerebral infarction (35 marks)

Question 6

6.1 Name 3 types of Cystic Diseases of the Kidneys

(100 marks)

(15 marks)

6.2 Name 4 clinical signs and symptoms of renal stones

(20 marks)

6.3 Briefly describe the condition cryptorchidism in males

(15 marks)

6.4 Describe the disease named Myasthenia Gravis

(20 marks)

6.5 Name 3 tests per analysis method mentioned below

6.3.1 Urinalysis

6.3.2 Blood chemistry

(30 marks)



Faculty of Health Sciences
Bachelor of Science Honours in Industrial Pharmaceutical Sciences
IPS 2233 - Industrial Pharmaceutics I
Batch - 04
2nd year 2nd semester
End Semester SEQ Examination

INDEX NUMBER:

Date : 26th of August 2022
Time : 09.00 am – 12.00 pm (Three Hours)

INSTRUCTIONS TO CANDIDATES

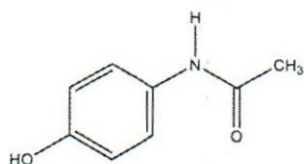
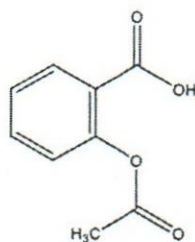
- This question paper consists of **SIX** questions.
- Answer **ALL** questions.
- You should write legibly in black or blue ink.
- You are allowed to use non-programmable calculators.
- You are not allowed to take out the examination papers.

Question 01**(100 marks)**

- 1.1. Draw the schematic representation of cumulative amount of drug release from immediate and delayed release tablets. (15 marks)
- 1.2. Describe the main 03 information sources available in field of pharmacy. (25 marks)
- 1.3. Powder is a mixture of finely divided drugs in dry form. It is used as a primary solid dosage form in pharmaceutical industry.
- 1.3.1. State 05 properties of powders relevant to pharmaceutical formulations. (15 marks)
- 1.3.2. Briefly describe 01 powder comminution method used in extemporaneous compounding. (15 marks)
- 1.3.3. Discuss the advantages and disadvantages of powder as a dosage form. (30 marks)

Question 02**(100 marks)**

- 2.1. Write 05 physicochemical properties of drug molecules. (15 marks)
- 2.2. Briefly describe the importance of water solubility in pharmaceuticals. (20 marks)
- 2.3. Compare and contrast the water solubility of these two drug molecules (a) and (b) using "cates and Lemke method". (Show your calculations) [π value of phenyl (+2.0), Carbonyl (-0.7), methyl (+0.5), ether (-0.1) & carboxyl (-0.7), hydroxyl (-1.0), amide (-0.7), ester (-0.7)] (35 marks)

**(a)****(b)**

- 2.4. Sulfadiazine is antibiotic used to treat or prevent infections in many different parts of the body. Calculate the degree of ionization and find out the site of administration of sulfadiazine. Show your calculations. (Consider the stomach pH is 1.4 and pH of the small intestine is 6.8. pKa of sulfadiazine is 6.99) (30 marks)

Question 03**(100 marks)**

- 3.1. State the main composition of yellow ointment USP. (10 marks)
- 3.2. Write **05** desirable properties of an appropriate ointment base. (20 marks)
- 3.3. Write a descriptive account on preparation of ointments by incorporation method. (40 marks)
- 3.4. Write short notes on following.
- 3.4.1. Physiological factors affecting for the drug absorption from rectal suppositories. (15 marks)
- 3.4.2. Preparation of suppositories by molding method. (15 marks)

Question 04**(100 marks)**

- 4.1. What are the types of ingredients used in formulation of drug filled in hard gelatin capsules? Give example for each type. (20 marks)
- 4.2. Briefly describe the limitations of soft gelatin capsules. (20 marks)
- 4.3. What are the advantages and disadvantages of soft gelatin capsules? (25 marks)
- 4.4. Describe the steps involved in making empty hard gelatin capsules. (35 marks)

Question 05**(100 marks)**

- 5.1. What is a pharmaceutical excipient? (10 marks)
- 5.2. Briefly describe the physiochemical properties of fillers used in pharmaceuticals. (20 marks)
- 5.3. List **05** ideal properties of an excipient. (20 marks)
- 5.4. Compare O/W and W/O creams. (20 marks)
- 5.5. Describe the ideal characteristics of creams. (30 marks)

Question 06**(100 marks)**

- 6.1. What are the types of tablet presses? (10 marks)
- 6.2. State the steps involve in sugarcoating of tablets. (15 marks)
- 6.3. Classify the different types of tablets. (20 marks)
- 6.4. Briefly describe the advantages and disadvantages of wet granulation. (20 marks)
- 6.5. Describe the wet granulation process using a diagram. (35 marks)



Faculty of Health Sciences

**Bachelor of Science Honours in Biomedical Science/ Bachelor of Science
Honours in Industrial Pharmaceutical Science/ Bachelor of Science
Honours in Cosmetic Science**

**BMS 2213/ IPS 2213/ BCS 2213
Anatomy and Physiology II**

2nd Year 2nd Semester

End Semester SEQ Examination

4th Batch

INDEX NUMBER:

Date : 22nd August 2022
Time : 09.00 a.m. – 11.00 a.m. (Two Hours)

INSTRUCTIONS TO CANDIDATES

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

Question 1**(100 marks)**

- 1.1 Describe the microscopic structure of the functional unit of kidneys. (30 marks)
- 1.2 Write the differences between male and female urethra. (20 marks)
- 1.3 Describe the process of urine formation. (25 marks)
- 1.4 Outline the functions of following structures of male reproductive system. (15 marks)
- 1.5 Outline the functions of male sex hormones (10 marks)

Question 2**(100 marks)**

- 2.1 "Pancreas belongs to both exocrine and endocrine glands." Comment on this statement. (25 marks)
- 2.2 Describe the microscopic view of cortex of human ovary. (25 marks)
- 2.3 Fill the table given below with the hormones secreted by anterior pituitary, target cells/organs and the function of hormone. (20 marks)

HORMONE	TARGET	FUNCTION
Eg. Thyroid (TSH) Stimulating Hormone	Thyroid gland	TH synthesis & release
a.		
b.		
c.		
d.		
e.		

- 2.4 Describe the process of oogenesis and the follicular development. (30 marks)

Question 3**(100 marks)**

- 3.1 Describe the structure of a neurone. (25 marks)
- 3.2 Describe the structure of auditory ossicles. (25 marks)
- 3.3 Outline the functions of the skin. (25 marks)
- 3.4 Describe the stages of action potential of a neurone. (25 marks)

Question 4**(100 marks)**

- 4.1 List the main types of joints based on their structural differences giving example for each type. (20 marks)
- 4.2 Describe the structure of a synovial joint. (30 marks)
- 4.3 Outline the functions of bones in human skeletal system. (20 marks)
- 4.4 Describe the process of skeletal muscle contraction. (30 marks)



Faculty of Health Sciences
Bachelor of Science Honours in Industrial Pharmaceutical Sciences
IPS 2243 - Inorganic Chemistry
Batch - 01
2nd year 2nd semester
End Semester SEQ Examination

INDEX NUMBER:

Date : 04th May 2021
Time : 09.00 am – 12.00 pm (Three hours) - To answer the questions
12.00 pm – 12.30 pm (30 minutes) - To upload & email the compiled answer script

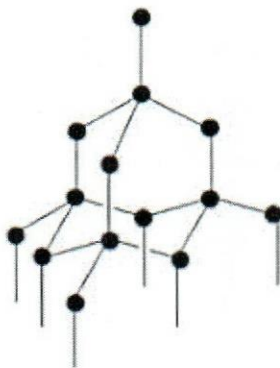
INSTRUCTIONS TO CANDIDATES

- This question paper consists of **SIX** questions.
- Answer **ALL** questions.
- The paper will be for 3 hours (9.00 a.m. - 12.00 p.m.). You will be given an extra 30 minutes for submission. Any submission after 12.30 p.m. will not be accepted.
- You should write the answers in **A4 sheets** legibly in black or blue ink.
- You **MUST** write **exam name, module code, your name and index number** of each answer script **according to the previously circulated format via email**.
- **Answer script** should be numbered (right bottom) clearly.
- Photograph of your answer scripts must be taken by keeping them on a clear platform (e.g. table).
- Arrange the photographs of your answer script in a word document in an orderly manner, then convert the word document to a PDF.
- **Label the PDF: Your Index No – Inorganic Chemistry SEQ**
- **Upload** the labelled PDF to LMS AND also email the PDF to Fohs.exams@cinec.edu

01

(100 marks)

- 1.1. Define "anomalies of elements" by providing an example. (15 marks)
- 1.2. Briefly describe the solubility of a chemical substance. (15 marks)
- 1.3. Considering alkali metals, second ionization enthalpies are very high as compare with the respective first ionization enthalpies. Comment on this statement. (20 marks)
- 1.4.



- This compound consists with high melting point. Identify the compound and briefly describe the reason for it. (20 marks)
- 1.5. Discuss the properties and reactivity of alkali metal oxides with water. Your answer should include possible chemical reactions. (30 marks)

02

(100 marks)

- 2.1. What are the main types of chemical interactions and give two examples for each? (20 marks)
- 2.2. Write short notes on following. (30 marks)
 - a) Hydrogen bond
 - b) Ionic Bond
- 2.3. What is meant by bioinorganic chemistry? (10 marks)
- 2.4. State the four main categories of biologically important elements by giving 2 examples for each. (20 marks)
- 2.5. Briefly discuss the importance and the places that can find Na^+/K^+ ATPase exchange pump in our biological systems. (20 marks)

03

(100 marks)

- 3.1. What are known as inorganic polymers? (15 marks)
- 3.2. Classify inorganic polymers on the basis of chemical constituents. (20 marks)
- 3.3. Name the different types of connectivities found in inorganic polymers. (15 marks)
- 3.4. Describe the advantages of 'Inorganic Polymers' over 'Organic Polymers'. (20 marks)
- 3.5. Discuss about the methylmercury toxicity. (30 marks)

04

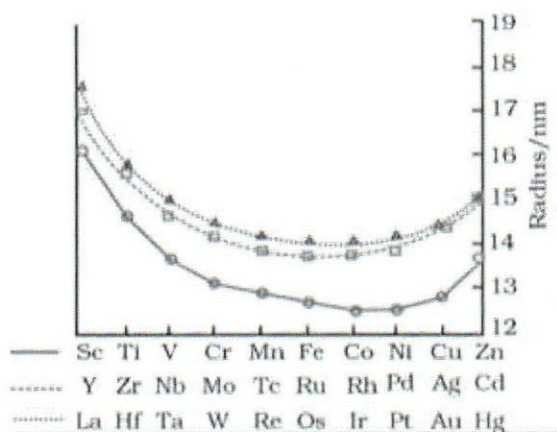
(100 marks)

- 4.1. List the clinical symptoms associated with Ca, Mg, Fe and F deficiency in human. (20 marks)
- 4.2. Discuss the importance of Ca^{2+} ions in our biological system. (30 marks)
- 4.3. State the elements which are involved in ATP synthesis. (10 marks)
- 4.4. Describe the structure of hemoglobin. (20 marks)
- 4.5. Why cytochrome enzymes are important in drug development? (20 marks)

05

(100 marks)

- 5.1. State why "Scandium" does not considered as a transition element. (10 marks)
- 5.2. What is meant by disproportionation of an oxidation state? Give an example. (15 marks)
- 5.3.



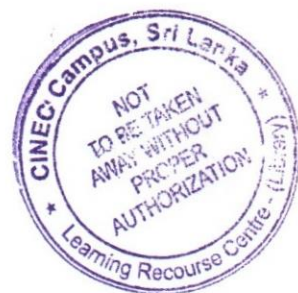
This graph shows the trends of atomic radii of transition elements in 3d, 4d and 5d series in periodic table. Discuss why there is a similar atomic radii in 4d and 5d series elements in d block. (15 marks)

- 5.4. Describe how Fe^{3+} ion provides the catalyst activity in a chemical reaction. (20 marks)
- 5.5. State **05** trends in physical properties of noble gases. (20 marks)
- 5.6. Discuss the risk associated with Radon. (20 marks)

06

(100 marks)

- 6.1. List the essential trace elements of the human body. (15 marks)
- 6.2. What is meant by 'Heavy Metal'? Give examples. (15 marks)
- 6.3. Define "Bioaccumulation" and "Biomagnification". (20 marks)
- 6.4. Discuss about the chelation therapy. (30 marks)
- 6.5. Briefly describe about the side effects of chelating agents. (20 marks)



Faculty of Health Sciences
Bachelor of Science Honours in Industrial Pharmaceutical Sciences
IPS 2233 - Industrial Pharmaceutics I
Batch - 01
2nd year 2nd semester
End Semester SEQ Examination

INDEX NUMBER:

Date : 30th of April 2021
Time : 09.00 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.
- You are not allowed to take out the examination papers.

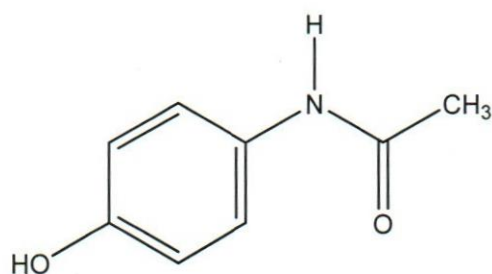
Question 01**(100 marks)**

- 1.1. State the importance of general notices consisted within the British Pharmacopoeia. (10 marks)
- 1.2. State the difference between general monographs and specific monographs. (15 marks)
- 1.3. Briefly describe the main categorization of information sources. (25 marks)
- 1.4. Write a descriptive account on aqueous solutions. (50 marks)

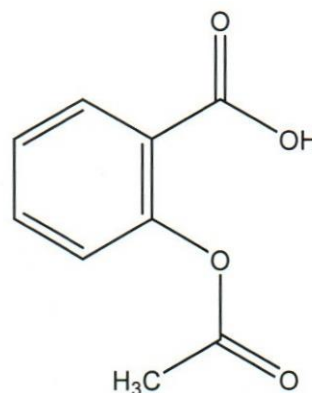
Question 02**(100 marks)**

- 2.1. List down five physicochemical properties of a drug molecule. (10 marks)
- 2.2. Compare and contrast the solubility and the absorption through a biological membrane of following drug molecules (a) and (b) using "cates and lemke method".
[π value of phenyl (+2.0), hydroxyl (-1.0), amide (-0.7), methyl (+0.5), ester (-0.7) & carboxyl (-0.7)]

(30 marks)



(a)



(b)

- 2.3. The Amoxicillin drug is administered orally into the body. Calculate the degree of ionization and find out the site of administration of Amoxicillin.
(Consider the stomach pH is 1.4 and pH of small intestine is 6.8. pKa of Amoxicillin is 2.4) (30 marks)
- 2.4. What are the advantages and disadvantages of capsules? (20 marks)
- 2.5. What are the steps involved in the manufacturing of empty hard gelatin capsules? (10 marks)



Faculty of Health Sciences
Bachelor of Science Honours in Industrial Pharmaceutical Science
Pathology of diseases IPS 2253
2nd year 2nd Semester
End Semester SEQ Examination

INDEX NUMBER:

Date : 29.04.2021
Time : 9.00 a.m. – 12.00 noon

INSTRUCTIONS TO CANDIDATES

- This question paper consists of **06** questions.
- Answer **all** questions.
- You should write legibly in black or blue ink.
- You are not allowed to take out the examination papers.

Question 1

- 1.1 State the classification of hypersensitivity. (10 marks)
- 1.2 Briefly describe the cellular and vascular changes seen in anaphylaxis. (25 marks)
- 1.3 Compare immune complex-based hypersensitivity with cell mediated hypersensitivity. (20 marks)
- 1.4 Describe the macroscopic and clinical features of a benign tumours giving examples. (20 marks)
- 1.5 Compare the pathological features of benign and malignant tumours. (25 marks)

Question 2

- 2.1. Describe the histologic analytical tumour classifications of,
 - 2.1.1. grading (25 marks)
 - 2.1.2. staging (25 marks)
- 2.2 Describe TNM classification. (25 marks)
- 2.3. Describe the process of dissemination of a malignancy. (25 marks)

Question 3

- 3.1 Describe the process of antigen processing of MHC class II receptor and B cell activation (25 marks)
- 3.2 Compare primary and secondary immune responses. (25 marks)
- 3.3 Describe the pathological basis of,
 - 3.3.1 myasthenia gravis (25 marks)
 - 3.3.2 Hashimoto's thyroiditis (25 marks)

Question 4

A 54-year-old businessman presented with cough and intermittent fever for 3 months. His sputum showed acid fast bacilli, positive for Mantoux test and X ray showed caseation and cavitation in left upper lung.

- 4.1.1. State the clinical diagnosis. (05 marks)
- 4.1.2. Describe the possible microscopic and macroscopic appearance of his lung lesion. (25 marks)
- 4.2. Describe pathophysiology of type II diabetes mellitus. (25 marks)
- 4.3. Compare glomerular dysfunction with tubular dysfunction in renal failure. (25 marks)
- 4.4. Describe pathophysiology of asthma. (20 marks)

Question 5

- 5.1 List five main types of cellular adaptations. (10 marks)
- 5.2 Compare physiological and pathological hyperplasia. (20 marks)
- 5.3 List the causes of cell injury. (10 marks)
- 5.4 Describe different types of necrosis including examples. (40 marks)
- 5.5 Briefly describe gross and microscopic appearance of amyloidosis. (20 marks)

Question 6

- 6.1 List cardinal features of acute inflammation. (10 marks)
- 6.2 Describe cellular and vascular changes seen in acute inflammation. (25 marks)

6.3 List the cells involved in chronic inflammation.

(15 marks)

6.4 Describe the pathological process of chronic inflammation giving an example.

(30 marks)

6.5. Shortly describe the cell derived chemical mediated in inflammation.

(20 marks)



Faculty of Health Sciences
Bachelor of Science Honours in Industrial Pharmaceutical Sciences
BMS 2234 - Instrumentation
Batch - 01
2nd year 2nd semester
End Semester SEQ Examination

INDEX NUMBER:

Date : 29th of April 2021
Time : 09.00 am – 11.00 am (Two Hours)

INSTRUCTIONS TO CANDIDATES

- This question paper consists of **FOUR** 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 (100 marks)

- 1.1 What are the three types of glassware used to contain and delivery of liquids? Briefly explain each type. (30 marks)
- 1.2 What is the difference between graduated pipettes and serological pipettes? (10 marks)
- 1.3 Briefly explain "calibration of instruments". (10 marks)
- 1.4 What are the types of freeze dryers? (15 marks)
- 1.5 What are the three main principles of protein analysis? Briefly explain each principle. (45 marks)

Question 02 (100 marks)

- 2.1 What is the difference between colorimetric procedure and photometric procedure in UV-Visible spectrophotometry? (10 marks)
- 2.2 What are the basic applications of chromatography techniques? (15 marks)
- 2.3 State the basic components of a High-Performance Liquid Chromatography machine and state the functions of each component? (25 marks)
- 2.4 What is the difference between the liquid chromatography technique and the gas chromatography technique? (20 marks)
- 2.5 Differentiate the accuracy, precision and sensitivity. (30 marks)

Question 03 (100 marks)

- 3.1 State five good laboratory practices of using microscopes. (15 marks)
- 3.2 Differentiate class I and class II biosafety cabinets. (30 marks)
- 3.3 Describe the speed calibration method of laboratory centrifuge. (30 marks)
- 3.4 What is a microtome? State the uses of different types of microtomes. (25 marks)

Question 04 (100 marks)

- 4.1 Why a PCR machine is known as a thermal cycler? (15 marks)
- 4.2 Describe the importance of thermal cycler. (30 marks)
- 4.3 State the procedure use to visualize DNA in an agarose gel using gel documentation system. (15 marks)

4.4 State five advantages of immunoturbidimetry.

(10 marks)

4.5 Describe the principle and uses of the flow cytometer.

(30 marks)



Faculty of Health Sciences
Bachelor of Science Honours in Industrial Pharmaceutical Science
IPS 2213 Anatomy and Physiology II
2nd year 2nd semester
End Semester SEQ Examination

INDEX NUMBER:

Date : 27th April 2021
Time : 09.00 a.m. – 11.00 a.m. (Two Hours)

INSTRUCTIONS TO CANDIDATES

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

1. Male gonads are the major site of spermatogenesis and synthesis of male sexual hormones. Male reproduction depends on sperms generated by spermatogenesis and gonadal hormones secreted from the testes.
- 1.1 What is the site of spermatogenesis in the testes? (10 marks)
 - 1.2 List the gonadotrophic hormones involving in spermatogenesis. (10 marks)
 - 1.3 Describe the functional process of spermatogenesis. (35 marks)
 - 1.4 Write the main function of the following structures of male reproductive system
 - 1.4.1 Epididymis (15 marks)
 - 1.4.2 Seminal vesicles (15 marks)
 - 1.4.3 Prostate gland. (15 marks)
2. Regarding the formation of urine,
- 2.1 Describe the **three (3)** steps involved in formation of urine (30 marks)
 - 2.2 Define Glomerular Filtration Rate (GFR). (20 marks)
 - 2.3 State the following hormonal functions of renal tubule functions
 - 2.3.1. Antidiuretic hormone (10 marks)
 - 2.3.2. Atrial natriuretic peptide (ANP) (10 marks)
 - 2.3.3. Calcitonin (10 marks)
 - 2.3.4. Parathyroid hormone (10 marks)
 - 2.4 Define the Renal threshold (10 marks)
3. 3.1 List the main types of joints based on their structural differences giving example for each type. (15 marks)
- 3.2 Describe the structure of a synovial joint. (25 marks)
 - 3.3 List accessory structures associated with synovial joint. (10 marks)
 - 3.4 Indicate the classification of synovial joints based on the shape of the surfaces. (20 marks)
 - 3.5 List **five** large nerve plexuses formed on each side of the vertebral column. (20 marks)
 - 3.6 Define the anatomical term of dermatome. (10 marks)
4. 4.1 Name the **three** layers of meninges. (10 marks)
- 4.2 Describe the physiological functions of
 - 4.2.1 Eustachian tube (20 marks)
 - 4.2.2. vestibular apparatus (20 marks)
 - 4.3. Briefly describe the physiological events of vision (25 marks)
 - 4.4 Describe the gross and clinical anatomy of phrenic nerve (25 marks)



Faculty of Health Sciences
B.Sc. (Hons) in Cosmetic Science
BCS 2233 – Cosmaceutics
Batch - 03
2nd year 2nd semester
End Semester SEQ Examination

INDEX NUMBER:

Date : 28th January 2022
Time : 9.00 am to 12.00 pm

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.

MATERIALS REQUIRED

- You may use a scientific calculator. This must not be programmable and may be inspected during the examination. Programmable calculators, PDAs and mobile phones are not permitted in the examinations.

Question 01. (100 marks)

- 1.1 State the difference between suspension and emulsion. (10 Marks)
- 1.2 Write different types of cosmeceutical semisolid dosage forms. (20 Marks)
- 1.3 Classify the cosmeceuticals according to the mode of application by providing examples. (30 Marks)
- 1.4 Describe the cosmetics and cosmeceuticals. Your answer should include necessary examples. (40 Marks)

Question 02. (100 marks)

- 2.1 What are the 04 types of colourants used in lipsticks? (10 Marks)
- 2.2 List 05 commonly used excipients in cosmeceuticals. (25 Marks)
- 2.3 Briefly describe the action of 04 types of excipients used in cosmeceuticals along with examples. (25 Marks)
- 2.4 Write a descriptive account on thickeners used in cosmeceuticals. (40 Marks)

Question 03. (100 marks)

- 3.1 List the different types of shampoos. (10 Marks)
- 3.2 State the reason for incorporating the foam boosters in shampoos in addition to the surfactants. (10 Marks)
- 3.3 Briefly describe the importance of incorporating the germicide and anti-dandruff agents in shampoos. (20 Marks)
- 3.4 List 05 types of ingredients used in dusting powders and mention the purpose of incorporating them in the formulation. (20 Marks)
- 3.5 Discuss the benefits of using a face scrub. (40 Marks)

Question 04. (100 marks)

- 4.1 What are the advantages of capsules? (20 marks)
- 4.2 Briefly describe the steps involve in making empty gelatin capsules. (25 marks)
- 4.3 What are the limitations of soft gelatin capsules? (10 marks)
- 4.4 State the four ointment bases classified by the USP. (10 marks)
- 4.5 Describe the fusion method of ointment preparation. (35 marks)

Question 05. (100 marks)

- 5.1 Define quality specifications related to the British Pharmacopeia. (10 marks)
- 5.2 Comment on the validity of tertiary sources as information source. (15 marks)
- 5.3 Briefly describe the importance of infrared reference spectra available in BP. (15 marks)
- 5.4 Describe the pulverization by intervention method used in powder comminution. (20 marks)
- 5.5 Write a descriptive account on factors affected by particle size of powders. (40 marks)

Question 06. (100 marks)

- 6.1 What is cosmeceutical excipient? (10 marks)
- 6.2 Briefly describe the physiochemical properties of fillers used in pharmaceuticals. (25 marks)
- 6.3 Describe the wet granulation process using a diagram. (25 marks)
- 6.4 Compare and contrast oil in water and water in oil creams. (20 marks)
- 6.5 Briefly describe the ideal characteristics of creams. (20 marks)



Faculty of Health Sciences
B.Sc. (Hons) in Cosmetic Science
BCS 2233 – Cosmaceutics
Batch - 03
2nd year 2nd semester
End Semester SEQ Examination

INDEX NUMBER:

Date : 28th January 2022
Time : 9.00 a.m. to 12.00 p.m.

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.

MATERIALS REQUIRED

- You may use a scientific calculator. This must not be programmable and may be inspected during the examination. Programmable calculators, PDAs and mobile phones are not permitted in the examinations.

Question 01.**(100 marks)**

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- 2.1 What are the 04 types of colourants used in lipsticks? (10 Marks)
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Question 03.**(100 marks)**

- 3.1 List the different types of shampoos. (10 Marks)
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- 3.4 List 05 types of ingredients used in dusting powders and mention the purpose of incorporating them in the formulation. (20 Marks)
- 3.5 Discuss the benefits of using a face scrub. (40 Marks)

Question 04. (100 marks)

- 4.1 What are the advantages of capsules? (20 marks)
- 4.2 Briefly describe the steps involve in making empty gelatin capsules. (25 marks)
- 4.3 What are the limitations of soft gelatin capsules? (10 marks)
- 4.4 State the four ointment bases classified by the USP. (10 marks)
- 4.5 Describe the fusion method of ointment preparation. (35 marks)

Question 05. (100 marks)

- 5.1 Define quality specifications related to the British Pharmacopeia. (10 marks)
- 5.2 Comment on the validity of tertiary sources as information source. (15 marks)
- 5.3 Briefly describe the importance of infrared reference spectra available in BP. (15 marks)
- 5.4 Describe the pulverization by intervention method used in powder comminution. (20 marks)
- 5.5 Write a descriptive account on factors affected by particle size of powders. (40 marks)

Question 06. (100 marks)

- 6.1 What is cosmeceutical excipient? (10 marks)
- 6.2 Briefly describe the physiochemical properties of fillers used in pharmaceuticals. (25 marks)
- 6.3 Describe the wet granulation process using a diagram. (25 marks)
- 6.4 Compare and contrast oil in water and water in oil creams. (20 marks)
- 6.5 Briefly describe the ideal characteristics of creams. (20 marks)



Faculty of Health Sciences
Bachelor of Science Honours in Industrial Pharmaceutical Sciences

IPS 2233 - Industrial Pharmaceutics I

Batch - 02 & 03

2nd year 2nd semester

End Semester SEQ Examination

INDEX NUMBER:

Date : 28th of January 2022
Time : 09.00 am – 12.00 pm (Three Hours)

INSTRUCTIONS TO CANDIDATES

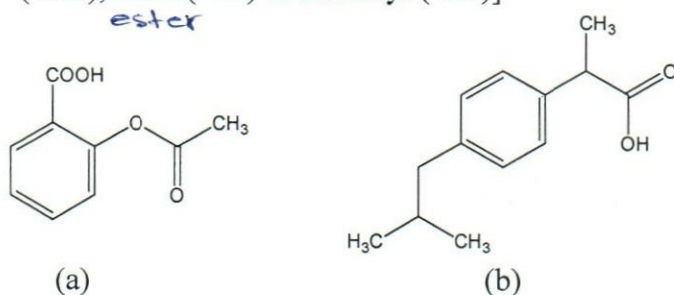
- This question paper consists of **SIX** questions.
- Answer **ALL** questions.
- You should write legibly in black or blue ink.
- You are not allowed to take out the examination papers.

Question 01**(100 marks)**

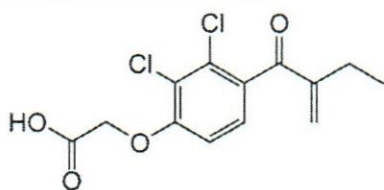
- 1.1. Define quality specifications related to the British Pharmacopoeia. (10 marks)
- 1.2. Comment on the validity of tertiary sources as information source. (15 marks)
- 1.3. Briefly describe the importance of infrared reference spectra available in BP. (15 marks)
- 1.4. Draw the graph for schematic representation of the cumulative amount of drug released from extended-release tablets. (20 marks)
- 1.5. Write a descriptive account on factors affected by the particle size of powders. (40 marks)

Question 02**(100 marks)**

- 2.1. State 5 physicochemical properties of drug molecules. (15 marks)
- 2.2. Why water solubility is important in pharmaceuticals? (20 marks)
- 2.3. Molecule (a) and (b) are two non-steroidal anti-inflammatory drugs molecules. Compare and contrast the water solubility of these two drug molecules using "cates and lemke method". (Show your calculations) [π value of phenyl (+2.0), Carbonyl (-0.7), methyl (+0.5), ether (-0.1) & carboxyl (-0.7)] (35 marks)



- 2.4. Ethacrynic acid is a loop diuretic administered orally into the body to treat high blood pressure and the swelling caused by diseases like congestive heart failure. Calculate the degree of ionization and find out the site of administration of Ethacrynic acid. Show your calculations. (Consider the stomach pH is 1.4 and pH of the small intestine is 6.8. pKa of Ethacrynic acid is 2.5) (30 marks)



Ethacrynic acid

Question 03**(100 marks)**

- 3.1. State the types of methods used in the preparation of effervescent granules. (10 marks)
- 3.2. Briefly describe the pulverization by intervention method used in powder comminution. (15 marks)
- 3.3. List the advantages of the rectal route over the oral route of drug administration. (20 marks)
- 3.4. Draw a flow chart to show the steps used in the preparation of suppositories by the molding method. (20 marks)
- 3.5. Describe how lipid water solubility affects the drug absorption by rectal suppositories. (35 marks)

Question 03 (100 marks)

- 3.1. State **02** (Two) disadvantages of powders as a dosage form. (10 marks)
- 3.2. Write down the categorization of particle sizes of powders according to the USP descriptive terms. (10 marks)
- 3.3. Describe the methods used in powder comminution. (30 marks)
- 3.4. List the advantages of the rectal route over the oral route of drug administration. (20 marks)
- 3.5. State **03** (Three) physicochemical factors affecting to the drug absorption from the rectal suppositories and briefly describe one of them. (30 marks)

Question 04 (100 marks)

- 4.1. What are the types of tablet presses? (10 marks)
- 4.2. What are the different types of immediate release tablets? (15 marks)
- 4.3. What are known as Delayed- Release tablets? Give examples (15 marks)
- 4.4. Discuss the advantages and disadvantages of wet granulation. (25 marks)
- 4.5. Explain the process of wet granulation. (35 marks)

Question 05 (100 marks)

- 5.1. Write a short note on (a) gelatin, (b) plasticizer. (20 marks)
- 5.2. What are the ointment bases classified according to the United State Pharmacopoeia (USP)? (20 marks)
- 5.3. State the general methods of ointment preparation. (10 marks)
- 5.4. Compare the difference of white petrolatum USP and the yellow ointment USP (30 marks)
- 5.5. What are the factors affecting the selection of appropriate ointment base? (20 marks)

Question 06 (100 marks)

- 6.1. List the different types of semi solid dosage forms (10 marks)
- 6.2. Name the different types of bases used in formulating creams (15 marks)
- 6.3. What are the ideal properties of semi solid dosage forms? (25 marks)
- 6.4. Briefly describe the advantages of semi solid dosage forms (20 marks)
- 6.5. Describe the general method of preparation of creams (30 marks)

Question 04**(100 marks)**

- 4.1. Briefly describe the steps involved in making empty hard gelatin capsules. (25 marks)
- 4.2. What are the limitations of soft gelatin capsules? (10 marks)
- 4.3. Factors affecting the selection of the appropriate ointment base. (10 marks)
- 4.4. Describe the fusion method of ointment preparation. (35 marks)
- 4.5. A pharmaceutical science undergraduate student is supposed to prepare 05 divided powders each containing 100mg of paracetamol. The total weight of the aliquot should be 120 mg.
 - a. Calculate the amount of diluent needed for one aliquot. (10 marks)
 - b. Calculate the total weight of trituration. (10 marks)

Question 05**(100 marks)**

- 5.1. Write the process that should follow to prepare the divided powders. (20 marks)
- 5.2. What is a pharmaceutical excipient? (10 marks)
- 5.3. Briefly describe the physiochemical properties of fillers used in pharmaceuticals. (25 marks)
- 5.4. List 05 ideal properties of excipients (15 marks)
- 5.6. Describe the wet granulation process using a diagram. (30 marks)

Question 06**(100 marks)**

- 6.1. Classify the different types of tablets. (20 marks)
- 6.2. State the steps involve in sugarcoating of tablets. (10 marks)
- 6.2. Compare oil in water and water in oil creams. (20 marks)
- 6.3. Describe the ideal characteristics of creams. (30 marks)
- 6.4. Briefly describe the bases used in the formulation of creams (20 marks)



Faculty of Health Sciences
Bachelor of Science Honours in Industrial Pharmaceutical Science
IPS 2243 - Inorganic Chemistry
Batch - 03 & 02
2nd year 2nd semester
End Semester SEQ Examination

INDEX NUMBER:

Date : 27th January 2022
Time : 09.00 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.
- You are not allowed to take out the examination papers.

MATERIALS REQUIRED

- You may use a scientific calculator. This must not be programmable and may be inspected during the examination. Programmable calculators, PDAs and mobile phones are not permitted in the examinations.

01**(100 marks)**

- 1.1. Briefly describe the solvation process using NaCl as an example. (15 marks)
- 1.2. State 03 colligative properties of a solution. (15 marks)
- 1.3. Considering alkali metals, second ionization enthalpies are very high as compare with the respective first ionization enthalpies. Justify this statement. (20 marks)
- 1.4. Comment on why tendency to show catenation of carbon family elements decreases down the group. (20 marks)
- 1.5. Discuss the properties and reactivity of alkali metal oxides with water. Your answer should include possible chemical reactions. (30 marks)

02**(100 marks)**

- 2.1. Draw the Lewis dot structure for following molecules. (25 marks)
- HCl
 - BF₃
 - NH₃
 - CHCl₃
 - H₂S
- 2.2. Describe the propertied of ionic bonds. (20 marks)
- 2.3. What are the differences between polar covalent bonds and nonpolar covalent bonds? (20 marks)
- 2.4. Discuss how hydrogen bonds are important to sustain the life. (35 marks)

03**(100 marks)**

- 3.1. Why is Helium used for superconducting magnets in NMR spectrometers? (20 marks)
- 3.2. "Xenon can be oxidized by a powerful oxidizing agent" (30 marks)
- What is the reason behind the above statement?
 - Justify the above statement with relevant chemical reactions.
- 3.3. Write the balanced chemical reaction for the preparation of Diisopropyldichlorosilane, via grignard reagent. (10 marks)
- 3.4. Write the structure of the cyclic trimer that you would obtain from the polymerization between dimethyl dihydroxy silane. (10 marks)
- 3.5. Discuss the preparation, properties, and uses of silicone fluids/oils. (30 marks)

04

(100 marks)

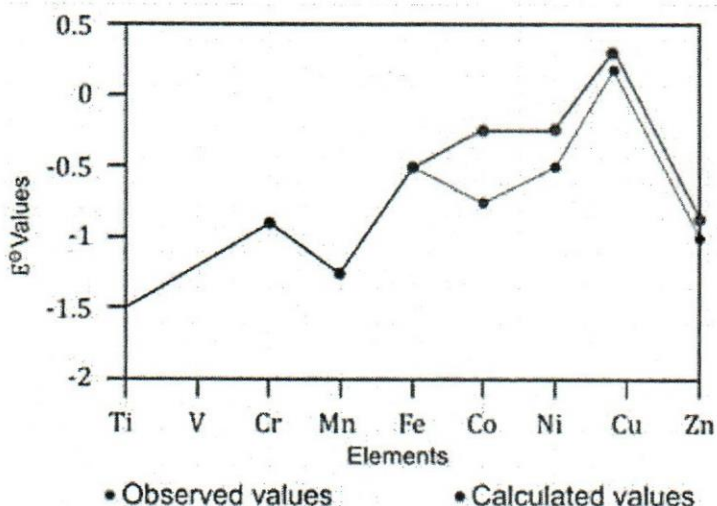
- 4.1. Categorize the biologically important elements and give 4 examples for each category. (20 marks)
- 4.2. State the clinical disorders related to the deficiency of Ca, Zn, F, Fe, Mg. (20 marks)
- 4.3. Describe the chemical structure and the importance of ATP in human body. (25 marks)
- 4.4. Describe the chemical importance of sodium and potassium elements in ATPase pump using a diagram. (35 marks)

05

(100 marks)

- 5.1. State the difference between diamagnetic and paramagnetic. (10 marks)
- 5.2. What is meant by disproportionation of an oxidation state? Give an example. (15 marks)

5.3.



Above graph shows the trends in M^{2+} / M standard electrode potentials of 3d series of transition elements. Based on this graph, comment on the reducing ability of element Cu with the presence of HCl acid and HNO_3 acid separately. Use balance chemical equations when necessary. (20 marks)

- 5.4. Describe how Fe^{3+} ion provides the catalyst activity in a chemical reaction. (20 marks)
- 5.5. Variation in atomic radii decreases across the 3d series while increases from 3d series to the 4d series of transition elements. Justify this statement. (35 marks)

06**(100 marks)**

- 6.1. What is the application of bioinorganic chemistry? (15 marks)
- 6.2. Differentiate the chemical structure of hemoglobin and myoglobin. (30 marks)
- 6.3. What is biomagnification? (10 marks)
- 6.4. Write short notes on the effect of following elements on humans. (45 marks)
- a. Arsenic
 - b. Cadmium
 - c. Lead



Faculty of Health Sciences
Bachelor of Science Honours in Cosmetic Science
BCS 2253 Pathology for Cosmetic Science
2nd Year 2nd Semester
End Semester SEQ Examination
3rd Batch

INDEX NUMBER:

Date : 26th January 2022
Time : 09.00 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 1 (100 marks)

- 1.1 State 3 respiratory diseases that can occur in heavy smoker (25 marks)
- 1.2 Briefly describe the macroscopy and microscopy of one of the diseases you mentioned in 1.1. (30 marks)
- 1.3 Briefly describe the five cardinal features observed in bronchus in acute severe asthma. (25 marks)
- 1.4 List two infections common in
- 1.4.1 Lung (10 marks)
- 1.4.2 Pharynx (10 marks)

Question 2 (100 marks)

- 2.1 Briefly describe macroscopic and microscopic features that will help to differentiate malignant tumour from a benign tumour. (25 marks)
- 2.2 State one malignant and 2 nonmalignant pathologies seen in uterus (20 marks)
- 2.3 Briefly describe the macroscopic features of the malignant pathology you mentioned 2.2. (20 marks)
- 2.4 Compare follicular cyst with chocolate cyst of ovary (20 marks)
- 2.5 What is endometriosis? Indicate the main pathological change. (15 marks)

Question 3 (100 marks)

- 3.1 List 3 pathological diseases seen in the breast tissue (20 marks)
- 3.2. List 4 clinical macroscopic signs important to diagnose breast carcinoma (10 marks)
- 3.3 Describe the morphology and causative factors of
- 3.3.1 Peptic ulcer (25 marks)
- 3.3.2 small bowel ischemia (25 marks)
- 3.4 List the types of intestinal polyps (20 marks)

Question 4 (100 marks)

- 4.1. List the types of intracranial hemorrhages (20 marks)
- 4.2. Compare congenital hydrocephalus with acquired hydrocephalus (30 marks)
- 4.3. List the two pathological basis for stroke attacks (20 marks)
- 4.4. List two microscopic and two macroscopic features of bacterial meningitis (20 marks)
- 4.5. List an example for glial and non-glial tumours in the brain (10 marks)

Question 5 (100 marks)

- 5.1. Describe pathological features of
- 5.1.1. adaptive hypertrophy (25 marks)
- 5.1.2. compensatory hyperplasia after partial hepatectomy (25 marks)
- 5.1.3. renal atrophy after arterial stenosis (25 marks)
- 5.1.4 epithelial metaplasia in bronchus in heavy smokers (25 marks)

Question 6 (100 marks)

6. 1 Describe the pathological basis of
- 6.1.1. Hushimoto's thyroiditis (25 marks)
- 6.1.2. Gigantism (25 marks)
- 6.1.3. Addison's disease (25 marks)
- 6.2. Describe the role of macrophage in chronic inflammation (25 marks)