Index no:.....

UNIVERSITY OF RUHUNA – FACULTY OF ALLIED HEALTH SCIENCES

DEPARTMENT OF PHARMACY

FIRST BPHARM PART II EXAMINATION – JANUARY 2018

PH 1242 PHARMACEUTICS IB (SEQ)

28

TIME: TWO HOURS

INSTRUCTIONS

- There are **four (04)** questions in the Parts A, B and C of the SEQ paper.
- Answer each part in a separate booklet.
- No paper should be removed from the examination hall.
- Do not use any correction fluid.
- Use illustrations where necessary.

PART A

1.

1.1. Define the term "surface tension". ***(10 marks)***

1.2.

1.2.1. A student, using a circular loop of wire and a pan of soapy water, produces a soap bubble with a radius of 1.0 mm. The surface tension of the soapy water is $\gamma = 2.5 \cdot 10^{-2}$ N/m. Determine the pressure difference between the inside and outside of the bubble. ***(30 marks)***

1.2.2. The soapy water described in 1.2.1. is used to produce a spherical droplet where radius is one-half (0.50 mm) that of the bubble. Find the pressure difference between inside and outside of the droplet. ***(30 marks)***

1.3. Briefly explain about "critical micelle concentration". ***(30 marks)***

2.

2.1. Define the term supersaturated solution. ***(10 marks)***

2.2. If solid $PbCl_2$ equilibrates with pure water, calculate the concentrations of Pb^{2+} and Cl^- ions in the solution at equilibrium? [Ksp $(PbCl_2) = 1.7 \times 10^{-5}$]. ***(40 marks)***

PART B

2.3. What is ionizing radiation? ***(10 marks)***

2.4. Write down **five** types of ionizing radiations. ***(10 marks)***

2.5. List **five** specific properties of ionizing radiation with compared to non- ionizing radiation. ***(10marks)***

2.6. Briefly explain the following biological effects of ionizing radiation giving an example for each effect.

2.6.1. Stochastic effect ***(10 marks)***

2.6.2. Deterministic effect ***(10 marks)***

3.

3.1. Explain the zero order reaction. (*10 marks*)

3.2. What is the shelf life of a drug for a zero order reaction? (*10 marks*)

3.3. Drug X degrades by a zero-order process with a rate constant of 0.05 mg ml^{-1} $month^{-1}$ at room temperature. If a 1% weight/volume (w/v) solution is prepared and stored at room temperature,

3.3.1. What concentration will remain after 12 months? (*15 marks*)

3.3.2. Calculate the shelf-life of the drug. (*15 marks*)

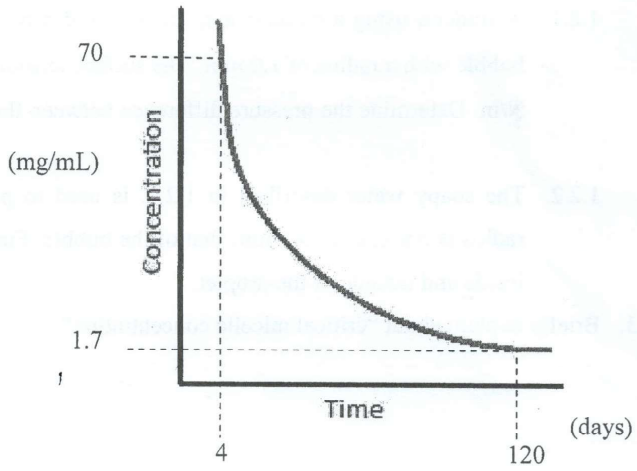
3.4. Explain the shear thinning and shear thickening behavior of non Newtonian fluids. (*10 marks*)

3.5. Sketch the graph of shear stress *against the* shear rate for each situation. (*10 marks*)

3.6. Give an example for shear thinning and shear thickening behaviors. (*05 marks*)

PART C

3.7. Answer following questions based on the graph given below.



3.7.1. Calculate the rate constant. (*10 marks*)

3.7.2. Calculate the initial concentration. (*10 marks*)

3.7.3. Calculate the half-life. (*05 marks*)

4.

4.1. Define the term "emulsion". (*10 marks*)

4.2. List **five** identification tests for the determination of type of the emulsion. (*10 marks*)

4.3. Briefly describe **one** test mentioned in 4.2 related to the identification of oil in water type emulsion. (*20 marks*)

4.4. Briefly describe the use of emulsifying agents in the production of emulsions. (*20 marks*)

4.5. An emulsion is a thermodynamically unstable preparation.

4.5.1. Differentiate creaming and cracking of an emulsion. (*15 marks*)

4.5.2. Briefly describe how you would overcome cracking of an emulsion. (*25 marks*)

@@@@@@@@@@