Ref. No. : Ex/PG/PHAR/T/127D/2018

Name of the Examination: M. PHARMACY FIRST YEAR SECOND SEMESTER - 2018

Subject : INDUSTRIAL PHARMACY - II **Time :** 3 hr **Full Marks :** 100

Answer any five questions from 3 groups and answer at least one question from each group

Group A

Q1.(i)What are the various process control variables and state variables controlling a bioprocess?

(ii)Classify fermentation process on the basis of process requirement and mode of operation.

(iii)Carry out mass balance in continuous fermentation process.

(iv)Give a flow sheet diagram of the fermentation process of any antibiotic.

Marks 4+2+8+6

Q2.Discuss briefly on various steps involved in preformulation studies.

Marks 20

Q3.(i) What is the significance of power law exponent 'n' in scale up technique? Give physical interpretation for different values of 'n'?

(ii)Discuss on scale up approach in mixing of monophasic dilute liquid and suspension.

Marks 5+15

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Subject: INDUSTRIAL PHARMACY-II Time: THREE HOURS Full Marks: 100

GROUP - B

Answer any five questions taking at least one question from each group

Q.4.a) Define the following terms: i) Crushing strength of tablets ii) Compaction and Consolidation of powders iii) Methods for tablet compression and granule filling in HG capsules. 2+4+4

b) What are the factors in radial force and how lubricating efficiency is calculated? Name one neutral anti-adherent and one soluble lubricant. 4+4+2

Q.5.a) What are the factors that govern the rate of degradation of a drug formulation in aqueous system? Use mathematical equations wherever applicable. 6

b) Explain the stabilization approaches for i) a multivitamin liquid formulation and ii) a long acting testosterone oil injection. 7+7

Q.6.a) Distinguish between traditional formulation development approach and QbD approach. 5

b)What is meant by stability indicating assay method? What are forced degradation studies? Why it is important? 2+6+2

c)What are the stability studies guidelines as per ICH? 5

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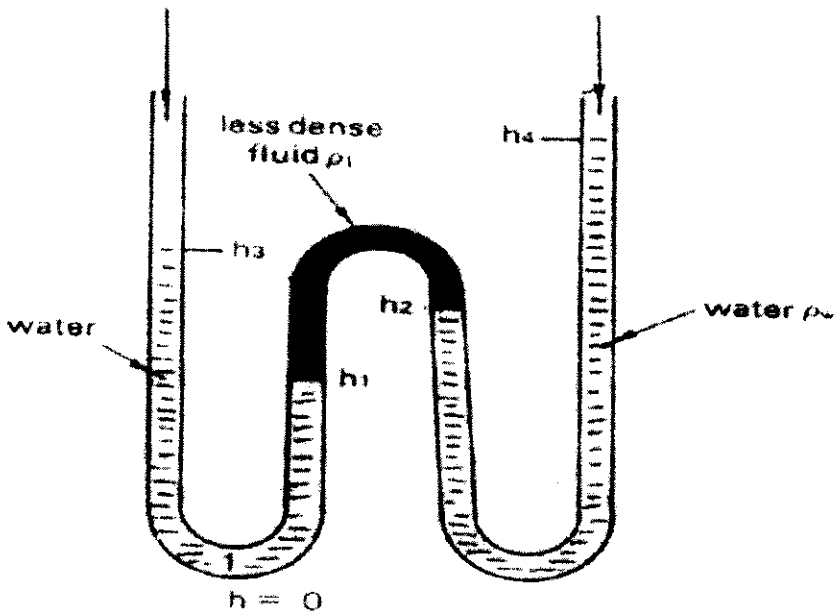
INDUSTRIAL PHARMACY-II TIME: 3 h FULL MARKS: 100

ANSWER ANY FIVE QUESTIONS TAKING ATLEAST ONE FROM EACH GROUP

GROUP-C

7.

a. A simple U-tube can be used to determine the specific gravity "s" of liquids which are denser than water by the arrangement shown below. Derive an expression for "s" in terms of h_1, h_2, h_3 and h_4.



b. A pipe of diameter 0.4 m carries water at velocity of 25 m/sec pressure at section 1 and 2 are given 29.43 N/cm^2 and 22.563 N/cm^2, respectively while the datum at 1 and 2 are 28 m and 30 m. Find the loss of head between 1 and 2.

c. Write a short note of rotameter.

d. What is the partial pressure of 1% CO_2 at atmospheric pressure (101.325 Kpa) and room temperature (25°C or 298.15K)? Write short notes on humidity, pressure and vibration sensor.

e. What are the Key Environmental issues addressed in Xith plan? Explain each of the points briefly.

[5+4+3+4+4=20 marks]

8.

a. Draw the flowsheet for the optimization parameters.

b. Write a note on classic optimization.

c. Define experimental design. What are the types of experimental design known till date? Write short notes on each of the following.

d. Demonstrate Newton Raphson Method on the following system : $g(x) = (3x-2)^2(2x-3)^2$

e. UNION DRUG makes two products A and B. Two resources R_1 and R_2 are required to make these products. Each unit of A requires 1 unit of R_1 and 3 units of R_2. Each unit of B requires 1 unit of R_1 and 2 units of R_2. The company has 5 units of R_1 and 12 units of R_2 available. The company also makes a profit of ₹ 6/unit of product A sold and ₹ 5/unit of product B sold. Find a condition where the company makes a profit.

f. RANBAXY INC. makes Volini. The estimated demand for the volini for the next four months are 10000, 8000,12000,9000 respectively. RANBAXY has a regular time capacity of 8000 per month and an overtime capacity of 2000 per month. The cost of regular time production is £ 20/unit and the cost of overtime production is £25/unit. RANBAXY can carry inventory to the next month and the holding cost is £3/unit/month. The demand has to be met every month. Minimize the demand for this condition so that the profit will be maximized.

[2+2+4+2+5+5=20marks]

9.

a. Define a. Beers law, b. Lambert's law, c. Beer-Lambert's law, d. Bragg's law

b. Draw a schematic diagram of single beam and double beam of a spectrophotometer. How will you select a solvent and container in case of a UV-vis spectroscope? What is apodization function and phase correction. What are the advantages of FTIR spectrophotometer?

c. Write a short note on column chromatography, gas chromatography and supercritical fluid chromatography,

d. Write a short note on the various types of monochromators available. Write short note on any two X-Ray diffraction methods.

e. What are the various types of thermal analysis that a sample can be subjected? Write the final form of any two of the following theories: i. Speil theory, ii. Boersma equation, iii. Pacor expression, iv. Gray general theory related to thermal analysis. Draw the flowsheet of control loupes in DSC.

[4+6+3+2+5=20 marks]

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