DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE – RAIGAD -402 103

First Sessional Examination – October - 2017

Branch:M.Pharm (Pharmaceutics)   **Sem.:- I**

Subject with Subject Code:-Modern Pharmaceutics MPH102T   **Marks: 30**

Date:-11.10.2017   **Time:- 1.30Hr.**

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Marking scheme and solution of the paper

Instructions:-   (if any)   **Marks**

Q.No.1   Attempt any Five of the following (5 X 2)   (10)

   a. Reduction of pain at site, making formulation isotonic, explanation of the same
   b. Independent factor –The factor that act on system, may be continuous and discrete 1 mark   dependent factors- Are measured properties of a system   01 mark
   c. Soda lime glass is internally treated with sulpher di oxide to neutralize surface alkali. Hence to check the effectiveness of this process water attack test is used
   d. Protection to drug form oxidation by i) being preferentially oxidized and thereby gradually used up, ii) by blocking an oxidative chain reaction in which they are not usually consumed…examples…Ascorbic acid, sodium bisulfate, sodium metabisulfite, sodium formaldehyde sulfoxylate, thiourea
   e. Use of resources to reach to objective quickly, best possible precision, minimize number of experiments, save resources, helps to formulate quality products with economy
   f. Any four applications of RSM out of the following---each application 0.25 mark
       i.   Optimizing the process for formulation
       ii.   Carry out simulation with model equation
       iii. Obtaining a process or product with response within a fixed range of values
       iv.   Assist development, scale up, and transfer
       v.   Plotting the response
       vi.   To find robustness of process
   g. $CoCl_2$/filter paper test of emulsion
       Filter paper is impregnated with $CoCl_2$ and dried (blue) changes to pink when o/w emulsion is added. Test may fail if emulsion is unstable or breaks in presence of electrolyte.

Q.No.2   **Attempt any Two of the following (2X 5)**   **(10)**

    a. solid state stability----
        i.   Objective of the study   01 mark
        ii.   Explanation of solid state reactions   01 mark
        iii. Analytical tools used for this study   01 mark
        iv. Explanation of this study procedure   01 mark
        v.   Calculation of decay constant   01 mark
    b. Explanation of any two methods out of four---each method 2.5 marks
        i.   Capillary rise method
        ii.   Drop weight method
        iii. Wilhelmy plate method
        iv. Ring detachment method
    c. significance and advantages of factorial design. Draw 3^2 factorial design
        i.   Significance---1.5 marks
        ii.   Advantages---1.5 marks
        iii. Design ---2 marks

Q.No.3   **Attempt any One of the following (1X 10)**   **(10)**

    a. Interfacial film theory for emulsification
        i.   Explanation related to mixed film formation, mechanical strength and stability of emulsion-----6 marks
        ii.   Figures to explain above concept----2 marks
        iii. Concept of liquid crystalline layer on the interface of emulsion droplet with figrure-----2 marks
    b. Data given
        X_1=Temperature, X_2= pH, X_3= Catalyst, Y= Yield (%)

Design 2^3

Expt. run	X_1	X_2	X_3	Y
1	-1	-1	-1	12
2	+1	-1	-1	14
3	-1	+1	-1	68
4	+1	+1	-1	19
5	-1	-1	+1	42
6	+1	-1	+1	46

7	-1	+1	+1	71
8	+1	+1	+1	32

1. Magnitude of main effects and interaction of factors ---4 marks

2. Linear polynomial equation.----2 marks

3. Coefficients   ---2 marks

4. Final linear polynomial equation in terms of coefficients ---2 marks

bo=(12+14+68+19+42+46+71+32)/8= 38

Main effect

Effect of X_1= (14+19+46++32-12-68-42-71)/4= -20.5

Effect of X_2= (68+19+71+32+-12-14-42--46)/4=19

Effect of X_3=(42+46+71+32-12-14-68-19)/4=19.5

Interaction effect

Effect of X_1X_2=(12+19+42+32+-14-68-46-71)/4= -23.5

Effect of X_1X_3=(12+68+46+32-14-19-42-71)/4= 3

Effect of X_2X_3= (12+14+71+32-68-19-42-46)/4= -11.5

Effect of $X_1X_2X_3$= (14+68+42+32-12-19-46-71)/4= 2

Coefficients

b_1=Effect of X_1/2= -10.25 b_2= 9.5 b_3= 9.75 b_{12}= -11.75 b_{13}= 1.5 b_{23}= -5.75

 b_{123}= 1

Resulting model

Y= 38-10.25X_1+9.5X_2+9.75X_3-11.75X_1X_2+1.5X_1X_3-5.75X_2X_3+1$X_1X_2X_3$

Normal probalility plot suggests that factors X_1X_3 and $X_1X_2X_3$ are not significant and are therefore excluded from regression model

Resulting model

Y= 38-10.25X_1+9.5X_2+9.75X_3-11.75X_1X_2-5.75X_2X_3