

[119]

SARDAR PATEL UNIVERSITY

M. Sc. Pharmaceutical Chemistry (Semester-IV) Examination

Monday, 10/04/2017; Time-02:00 PM to 05:00 PM

SUBJECT CODE: PS04CPCH01

SUBJECT TITLE: Advances in Pharmaceutical Technology and Drug Delivery Systems

Maximum Marks: 70

Note: (1) All questions are compulsory.

(2) Figure to right indicates total marks of question.

Q-1 Choose the correct option for the following:

1 × 8

1. **Flashtab technology is patented by**
 - a. Zydus Cadila
 - b. Ranbaxy
 - c. Prographarm Laboratories
 - d. Torrent Pharma
2. **In wow tab technology WOW means**
 - a. Without water
 - b. With oil and water
 - c. Without oil and water
 - d. None
3. **The system in which information about the controlled variable (like temperature) is not used to adjust any of the system inputs to compensate for variation in the processes variables is known as:**
 - a. Closed loop
 - b. Open loop
 - c. Semi-loop
 - d. None of the above.
4. **The controller in which the amount of control action applied at the process input is either zero or the maximum available is known as:**
 - a. Self-operated
 - b. On-off
 - c. Pneumatic controller
 - d. None of the above
5. **Sodium alginate is an example of::**
 - a. Complex
 - b. Hydrocolloid
 - c. Both a and b
 - d. None of the above
6. **Which polymer has short degradation time:**
 - a. PLC
 - b. PLA
 - c. 50:50 PLGA
 - d. PDLA
7. **Controlled Drug Delivery Systems:**
 - a. Positive
 - b. Negative
 - c. Neutral
 - d. None of above
8. **The goal of targeted drug delivery is to::**
 - a. Localize
 - b. Prolong
 - c. Target
 - d. All of the above

Q-2 Answer the following (Any Seven).

2 × 7

1. What are the criteria for fast dissolving tablets?
2. Give the preparation of Nano-suspension.
3. Discuss in brief about pressure measurement devices.
4. What is the purpose of packaging?
5. What are the different methods for level measurement?
6. Enlist the advantages of controlled release products.

7. What is the advantage and disadvantage of reservoir DDS? 6
8. What is meant by magic bullet approach for targeted drug delivery? 6
9. Enlist cellulose based polymers. 6
- Q-3** A. Describe the various techniques for Preparing Fast Dissolving Tablets. 6
- B. Explain the Mechanism of Super-disintegrants. 6
- OR**
- B. Write a note on Preformulation studies of fast dissolving tablet. 6
- Q-4** A. Describe Criteria for the Selection of package type and package material. Give the required consideration of closures. 6
- B. Describe the approach to understand the process in pharmaceutical industry and elaborate the ERP process flow. 6
- OR**
- B. Write a note on automatic control system. 6
- Q-5** A. Write a note on Chitosan. 6
- B. Describe various factors to consider in the design of oral drug delivery system. 6
- OR**
- B. Enumerate various methods for production of Osmotically Controlled Systems and discuss in details. 6
- Q-6** A. Elaborate the niosomes mediated drug delivery. 6
- B. Write a note on matrix diffusion- controlled and micro reservoir transdermal drug delivery systems. 6
- OR**
- B. Describe the kinetic of transdermal permeation. 6

SARDAR PATEL UNIVERSITY
M. Sc. FOURTH SEMESTER Examination 2017

Saturday, 15th April 2017,

Time: 2.00 p.m. to 5.00 p.m.

PS04CPHC03,

ELECTRO ANALYTICAL METHODS

N.B. Figures to the right indicate marks.

Total Marks : 70

Q-1 Choose appropriate answers. (only code)

[08]

1. To minimize the electro static force one of the following is added into the solution
 (a) Carpenter Glue (b) Fevicol
 (c) salt (d) Inactive electrolyte
2. Which one of the following is a weak acid,
 (a) HNO₃ (b) HI
 (c) HBr (d) HF
3. The half reaction that occurs at the anode during electrolysis of molten NaBr is
 (a) $2\text{Br}^- \rightarrow \text{Br}_2 + 2e^-$ (b) $\text{Br}_2 + 2e^- \rightarrow 2\text{Br}^-$
 (c) $\text{Na}^+ + e^- \rightarrow \text{Na}$ (d) $2\text{H}_2\text{O} + 2e^- \rightarrow 2\text{OH}^- + \text{H}_2$
4. Unit of electrical conductance is
 (a) Volt (b) Ampere (c) Coulomb (d) Siemens
5. If K_w is 2.9×10^{-15} at 10°C. What is the P^H of pure water at 10°C
 (a) 6.72 (b) 7.00
 (c) 7.27 (d) 7.53
6. The P^{OH} of a solution of NaOH is 11.30. What is the [H⁺] for this solution
 (a) 2.0×10^{-3} (b) 2.5×10^{-3}
 (c) 5.9×10^{-3} (d) 2.9×10^{-3}
7. In a sample of pure water which one is always true at all temperature and pressure?
 (a) P^H = 7 (b) P^{OH} = 7 (c) [H₃O⁺] = 1×10^{-7} (d) [H₃O⁺] = [OH⁻]
8. For monobasic weak acids P^H equals to
 (a) log Ka (b) <log Ka (c) >log Ka (4) — log Ka

Q-5

- (a) Calculate the equivalent conductance of acetic acid at infinite dilution at 25 °C. ($\text{H}^+ = 349.8$, $\text{Na}^+ = 50.11$, $\text{Cl}^- = 26.34$ and $\text{CH}_3\text{COO}^- = 40.9$) [06]
- (b) Compare between low frequency and high frequency conductance techniques. [06]

OR

- (b) The equivalent conductance of 0.1 N solution of MgCl_2 is $97.1 \text{ ohm}^{-1} \text{ cm}^2/\text{eq}$. at 25 °C. A cell with electrodes that are 150 cm^2 in area and 0.5 cm apart filled with 0.1 N MgCl_2 . How much current will flow when the potential difference between electrodes is 5 Volt? [06]

Q-6

- (a) (i) Write down the advantages and disadvantages of dropping mercury electrode. [03]
- (ii) What do you mean by Polarographic hump? How this hump can be removed? [03]
- (b) Discuss current sampled and pulse polarography. [06]

OR

- (b) How much is the transition time of Cd^{+2} increases if solution of $1 \times 10^{-4} \text{ M}$ Cd^{+2} is added to $1.00 \times 10^{-4} \text{ M}$ Pb^{+2} solution? [06]

Q-2 Answer any seven of the following [14]

1. Calculate equilibrium constant for the reaction:
$$\text{Cu}_{(s)} + 2\text{Ag}^+_{(aq)} \rightarrow \text{Cu}^{+2} + 2\text{Ag}_{(s)}$$

(Given : ($E^0_{\text{cell}} = 0.46 \text{ v}$ and $E_{\text{cell}} = 0.0 \text{ v}$)
2. Calculate the P^H of N/100 H_2SO_4 solution and N/10 NaOH solution.
3. State relationships of electro analytical methods.
4. State sources of emf observed in glass electrode.
5. Why aqueous solutions are generally used in electro analytical methods.
6. State applications of P^H measurements.
7. Derive $E^0 = RT / nF \ln K$.
8. How basicity of an acid is determined by conductometry measurement.
9. Write down Ilkovic equation. Explain terms involved in it.

Q-3

(a) Differentiate between working and reference electrodes. Discuss Quinhydrone electrodes. [06]

(b) (i) State advantages and disadvantages of antimony electrode. [03]

(ii) write a note on solid state sensors and precipitate electrodes. [03]

OR

(b) (i) Calculate P^H of a solution after mixing 0.1M acetic acid with ~~20~~²⁰ ml 0.1M NaOH. ($K_a = 1.8 \times 10^{-5}$) [03]

(ii) Write down errors with glass electrodes in P^H measurement. [03]

Q-4

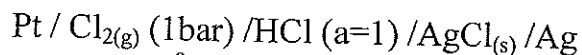
(a) Discuss First kind, second kind and third kind of electrodes in potentiometry. [06]

(b) (i) Explain chemical cell without transference. [03]

(ii) Write a note on amalgam electrodes. [03]

OR

(b) For the cell,



Calculate E^0 for Ag/AgCl/Cl⁻ electrode. ($E_{\text{cell}} = -1.1369\text{V}$, $E^0_{\text{Cl}^-/\text{Cl}} = 1.35\text{V}$) [06]

(103)

SARDAR PATEL UNIVERSITY
M. Sc. Pharmaceutical Chemistry, Semester- IV

Saturday, 15th April, 2017

Time: 02:00 pm to 05:00 pm

PS04CPCH03: Validation, Documentation and cGMP (CBCS)

Note: (i) Figures to the right indicate marks.

Total Marks - 70

Q-1 Choose the correct option and answer.

[08]

- (1) Drug validation path contains _____.
 (a) FDA approval (b) New Drug application
 (c) Clinical trials (d) All of these
- (2) SAT is _____.
 (a) Site and test (b) Site acceptance test
 (c) Site affecting test (d) None of these
- (3) Which one of the following affects a product is _____.
 (a) Quality and efficacy (b) Quality and purity
 (c) Quality, purity and efficacy (d) Purity and efficacy
- (4) OQ is _____.
 (a) Open Qualification (b) Operational Qualification
 (c) Over Qualification (d) None of these
- (5) Which of the following is not comes under the process of analytical method validation?
 (a) Writing and approval of method validation
 (b) Reporting the analytical method validation
 (c) Planning and deciding on the method validation experiments
 (d) None of the above
- (6) Normal term for Copyright is for a period of _____.
 (a) Five years (b) Ten years (c) Twenty years. (d) Sixty years
- (7) Trade mark is a recognizable _____.
 (a) Sign (b) Design (c) Unique expression (d) All of these.
- (8) TRIPS mean _____.
 (a) Trade Related Analysis of Intellectual Property Rights
 (b) Trade Related Aspects of Intellectual Property Rights
 (c) Trade Related Agreement of Intellectual Property Rights
 (d) None of the above

Q-2 Answer the following. (Any seven)

[14]

- (1) What is master validation plan?
- (2) Write a note on FDA and its approval.
- (3) Differentiate retrospective and concurrent validation.
- (4) Define efficacy.
- (5) Give the types of cleaning materials can be used in the clean room.
- (6) What is geographical indication? Give example.
- (7) Enlist the types of patent applications.
- (8) Write the conditions for withdrawal of patent application.
- (9) Write the types of works for which copyright protection is available.

- Q-3 (A) What is Validation? Explain the types of validation processes and the path of a validated system. [6]
(B) Write the concept, philosophy and importance of cGMP. What is its effect on manufacturing? [6]
- OR**
- (B) Write a note on the desirable qualities of a laboratory analyst. Why should we follow GLPs? [6]
- Q-4 (A) Write an essay on analytical method validation. [6]
(B) Write a note on various performance characteristics in analytical validation. [6]
- OR**
- (B) Give a brief account on validation for instrumentation qualification. [6]
- Q-5 (A) Give a detail account on the stages of Process Validation. [6]
(B) Write an essay on pharmaceutical clean room technology [6]
- OR**
- (B) Give a note on the statutory and regulatory requirements for process validation. [6]
- Q-6 (A) Write an essay on the 'Patent system in India' and a note on the rights of a patentee. [6]
(B) Write the procedure for registration of a work under the 'Copyright Registration act, 1957' and add a note on the powers of the Copyright Board. [6]
- OR**
- (B) What is Trademark? Write a note on the key features and administrative procedure of registration of trademarks. [6]

[82]

SARDAR PATEL UNIVERSITY
M. Sc. Pharmaceutical Chemistry (Semester-IV) Examination
Thursday, 18/04/2017; Time-02:00 PM to 05:00 PM
SUBJECT CODE: PS04EPCH01
SUBJECT TITLE: Advances Techniques of Synthetic Chemistry

Maximum Marks: 70

Note: (1) All questions are compulsory.

(2) Figure to right indicates total marks of question.

Q-1 Choose the correct option for the following: 1 × 8

1. Tundo developed a method to methylate active methylene compounds selectively using:
 - a. Methyl Chloride
 - b. Chlorine gas with aq. KOH
 - c. Anhydrous $AlCl_3$
 - d. Dimethylcarbonate
2. The solvent used in microwave must have dipole moment and temp than the desired reaction temperature:
 - a. 20-30°C higher
 - b. 20-30°C Lower
 - c. Same
 - d. None of the above
3. For green synthesis in Friedel-Crafts reaction catalyst used is:
 - a. $AlCl_3$
 - b. Clayzic
 - c. Zeolite
 - d. $MgSc(OTf)_3$
4. Catalyst soluble in water as well as in the organic solvent is known as:
 - a. Acid catalyst
 - b. Enzyme catalyst
 - c. Soap catalyst
 - d. Phase transfer catalyst
5. Michael reaction is an reaction between an α, β unsaturated carbonyl compound containing:
 - a. Active methylene group
 - b. Alternate double bond
 - c. Sulphonyl group
 - d. Can't say
6. Wittig-Horner Reaction used for the preparation of:
 - a. Olefins
 - b. Alkanes
 - c. Heterocyclic compound
 - d. None of the above
7. In parallel synthesis each reaction well contains a:
 - a. Single product
 - b. 6-8 products
 - c. Not less than 10 products
 - d. Can't say
8. Combinatorial syntheses can be carried out using:
 - a. Automated synthesizers
 - b. Semi-automated synthesizers
 - c. Both a & b
 - d. Can't say

Q-2 Answer the following (Any Seven).

2 × 7

1. Give the difference between percent atom utilization and percent economy.
2. What are the major criteria for the selection of starting material?
3. Show the importance of catalyst in green chemistry.
4. Explain the specificity of enzyme.
5. Give the role of green catalyst in Friedel-Craft's reaction.
6. Why aqueous phase reaction is preferable.

7. Describe Benzoin reaction.
8. What is on bit & off bit Screening?
9. Define Scaffold.
- Q-3 A. Give the use of polymer supported reagent by considering the PNBS and thioanisoly resin. 6
- B. Write a note on microwave induced green synthesis. 6
- OR**
- B. Give the application of ultra-sound in substitution, oxidation and saponification reaction. 6
- Q-4 A. Describe basic catalyst and polymer supported photosensitizers. 6
- B. Describe catalysis by enzymes of the major six classes with suitable example. 6
- OR**
- B. Give the role of crown ether for esterification and saponification. 6
- Q-5 A. What is Diel's Alder reaction? Give its application in pharmaceuticals. 6
- B. Write the mechanism of formation of furfural from biomass and Urethane. 6
- OR**
- B. Give the synthesis of Paracetamol and ibuprofen. 6
- Q-6 A. Write a note on solid phase technology in combinatorial chemistry with suitable example. 6
- B. Describe the processes used for planning & designing of combinatorial synthesis. 6
- OR**
- B. Explain dynamic combinatorial chemistry. 6
