# PHARMACY INDIA

## PRACTICE WORK SHEET - 5

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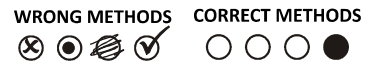
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WRONG METHODS | CORRECT METHODS

Sample PDF

# PRACTICE WORK SHEET - 5

## INDIA'S I<sup>ST</sup> OFFLINE TEST SERIES WITH DETAILED EXPLANATION

### FEATURES

- Each Worksheet Contain 125 Question
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# PHARMACY INDIA

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## PHARMACEUTICS

**1. Following statement is more accurate with respect to limitations of Arrhenius relationship for stability prediction**
   (a) Order of degradation will alter at higher temperature
   (b) Equal moisture concentrations will be mentioned at different temperatures
   (c) Less relative humidity and oxygen solubility at higher temperature
   (d) Same degradation mechanisms may predominate at different temperatures

**2. According to distribution law, select the appropriate expression for the concentration of a solute when it exist as monomer in solvent A and dimer in solvent B Assume**
   C = concentration of solute in solvent A
   C = concentration of solute in solvent B
   α = degree of dissociation
   (a) $K = \frac{C_A}{2 \times \sqrt{C_B}}$   (b) $K = \frac{C_A}{C_B \times (1 - \alpha)}$
   (c) $K = \frac{C_A}{C_B \times (2 - \alpha)}$ (d) $K = \frac{C_A}{\sqrt{C_B}}$

**3. Which of the following will result in very closest value to the Glomerular Filtration Rate (GFR)**
   (a) Insulin Clearance
   (b) Albumin Clearance
   (c) Measure of Blood Urea Nitrogen (BUN)
   (d) Creatinine Clearance

**4. Increasing the proportion of the disperse phase of an emulsion by more than 60% may lead to**
   (a) Cracking
   (b) Frothing
   (c) Phase inversion
   (d) Creaming

**5. The polymorphs exhibit the following different properties EXCEPT**
   (a) X-ray crystal and diffraction patterns
   (b) Melting point
   (c) Solubilities
   (d) Chemical structures

**6. Who was the Chairman of the Drugs Enquiry Committee which was established in the year 1927**
   (a) B. Mukherjee
   (b) Joseph Bhore
   (c) S.S. Bhatia
   (d) R.N. Chopra

**7. When six suppositories containing 20 percent of morphine hydrochloride in Theobroma oil are to be prepared, which of the following statement is correct?**
   (Given: Displacement value of morphine hydrochloride is 1.5, weight of each suppository is 1g)
   (a) The displacement value of morphine hydrochloride is to be considered
   (b) The displacement values of both morphine hydrochloride and Theobroma oil are to be considered
   (c) The displacement value of morphine hydrochloride is to be ignored
   (a) The displacement value of Theobroma oil is to be considered

**8. While studying solid state physicochemical properties, the packing property of drug include**
   (a) Heat capacity
   (b) Solubility
   (c) Refractive index
   (d) Entropy

# Practice Worksheet Explanation – 5

## 1. Ans (c) ARRHENIUS RELATIONSHIP FOR STABILITY PREDICTION

Accelerated Stability Studies are a kind of stability study which is used to predict the shelf life of the product, by accelerating the rate of decomposition, preferably by increasing the temperature of reaction conditions.

**Limitations**

- Stability predictions based on Arrhenius equation are valid only when the break down depends on temperature.
- The energy of activation obtained in the study should be between 10 to 30 kcal/ mole.
- At elevated temperature, the oxygen solubility and humidity are relatively low which can alter the value on prediction of stability.

## 2. Ans (d)

| $K = \dfrac{C_A}{B_B}$ | $K = \dfrac{C_A}{\sqrt{C_B}}$ |
|---|---|
| If the equilibrium substance (C1 and C2) in solvent A and solvent B<br><br>• The equation, known as the distribution law, is strictly applicable only in dilute solutions where activity coefficient can be neglected.<br>• K→ Equilibrium constant<br>• K is known as the distribution ratio, distribution coefficient or partition coefficient | If solute exists as a monomer in solvent a and dimer in solvent B |

## 3. Ans (d)

➢ Renal function can be determined by measuring the GFR.

| INULIN | CREATININE |
|---|---|
| It is exogenous fructose polysaccharide | Creatinine is an endogenous amine produced as a result of muscle catabolism |
| Inulin clearance provides an accurate measure of GFR but has the disadvantage of being a tedious method. | An advantage of this test is that it can be correlated to the steady state concentration of creatinine in plasma and needs no collection of urine. The method involves determination of serum creatinine levels. |

## 4. Ans (c)

The internal phase in monodisperse system (All particles having the same size) should not be more than 74% of total volume of system Volume of aqueous phase, relative to amount of oil phase (phase volume ratio), decides the rheological properties of emulsion.

| PHASE VOLUME RATIO | TYPE OF FLOW |
|---|---|
| 5% | Newtonian |
| 50% | Pseudoplastic |

| FUNICULAR STATE | As the volume of the granulating medium increases, the mass of the liquid bridges and the adhesive forces between the particles also increases. |
|---|---|
| CAPILLARY STATE | Further increase in the volume of the granulating medium. Results in the **displacement of air from the void volume of the particles.** The adhesive interaction between the particles is now due to a capillary effect at the liquid/air interface, i.e., at the surface of the growing granule. This state is perfectly suitable for the formulation of granules. |
| SOLID BRIDGING | On drying, wet agglomerates form solid bridges of binder. As drying progresses, a polymeric network (resembling the Pendular structure) becomes stronger, which largely contributes to the mechanical properties of the resultant granule. |

## 14. Ans (a)

| STEPS | DESCRIPTION |
|---|---|
| Dipping | Temperature of pins = 22° C<br>Solution temperature = 50° C<br>Time required= 12 seconds. |
| Spinning | Pins are rotated to distribute the gelatin uniformly around the pins |
| Drying | By use of dry air and dehumidification |
| Stripping | By bronze jaws |
| Trimming | By stationery knives |
| Joining | Cap and body are joined Polishing by the polymer |
| Polishing | The entire cycle of machine lasts approximately 45 min. |

**The entire cycle of machine lasts approximately 45 min**

## 15. Ans (a)

- Low viscosity (25 to 32 millipoise), High bloom strength (180-250 g) gelatins are used in conjunction with the capsulation of hygroscopic vehicles or solids and standard gelatin formulas can be modified so as to require upto 50% less water for satisfactory operation on the capsulation machine.
- These modified formulas afford less opportunity for the hygroscopic fill materials to attract water from the shell and thereby improve the ingredients and physical stability of the product.

## 16. Ans (d) CONTIDITION & SPECIFICATION OF CAPSULES

| S. NO. | CHARACTERISTIC | SPECIFICATION |
|---|---|---|
| 1. | Storage condition | $100^0$ F (35°C) |
| 2. | Processing area temperature | $22^0$ C |
| 3. | Humidity (handling of empty capsule) | 35-45% (In operating area |
| 4. | Bloom strength | 150 – 250 gm . |
| 5. | Viscosity for gelatin | 25-45 milipoise |
| 6. | Moisture content (Determine by Toluene distillation) | |
| | a. Hard gelatin capsule | 12-16 % |

**28. Ans (b) SALT FORMS:**
- Salts have improved solubility and dissolution characteristics in comparison original drug.
- It is generally accepted that a minimum difference of 3 units between the pKa value of the group and that of its counterion is required to form stable salts.
- Factors that influence salt selection are physical and chemical properties of the salt, safety of counterion, therapeutic indications and route of administration.

**SALT FORMATION DOES HAVE ITS LIMITATIONS:**
- It is not feasible to form salts of neutral compounds.
- It may be difficult to form salts of very weak bases or acids.
  The salt may be hygroscopic, exhibit polymorphism or has poor processing characteristics.
- Conversion of salt to free acid or base form of the drug on surface of solid dosage form that prevents or retards drug re lease.
- Precipitation of unionized drug in the GI milieu that has poor solubility.

**29. Ans (a) CLASSIFICATION OF BIOADHASIVE POLYMERS**

| ACCORDING TO SOURCES | |
|---|---|
| **NATURAL AND MODIFIED NATURAL** | **SYNTHETIC** |
| Agaros, Chitosan, Gelatin, Hyaluronic acid, Carrageenan, Pectin, Sodium alginate, Carboxy Methyl Cellulose, Thiolated CMC, Sodium CMC, HEC, HPC, HPMC, Methyl hydroxyethyl cellulose, etc. | Carbopol, Polycarbophil, Polyacrylic acid, Polyacrylates, Meth acrylic acid, Poly Vinyl Alcohol, Poly Vinyl Pyrollidine, Ethylhexaacrylate, Thiolated polymer, etc. |
| **ACCORDING TO WATER SOLUBILITY** | |
| **WATER SOLUBLE** | **WATER INSOLUBLE** |
| CMC, Thiolated CMC, Sodium CMC, HEC, HPC,HPMC, MC, HPMC, PVA, PVP, etc. | Carbopol, Polycarbophil, Polyacrylic acid, Polyacrylates Meth acrylic acid, PEG, etc. |
| **ACCORDING TO CHARGE** | |
| **CATIONIC AND ANIONIC** | **UNCHARGED** |
| Hydroxyethylated starch, HPC, PEG, PVA, PVP, etc. | Hydroxyethylated starch, HPC, PEG PVA, PVP, etc. |

**30. Ans (c) HYDROLYSIS ACTIVATED DRUG DELIVERY SYSTEM**

| DESCRIPTIONS | EXAMPLES |
|---|---|
| These systems are prepared from a bio erodible or bio-degradable polymer such as poly (orthoester) or poly(lactide glycolide) copolymer. Release of the drug is activated by hydrolysis of polymer base by tissue fluid at the implantation site. | Lupron (Implant Containing Leuprolide acetate). |

- Tiagabine inhibits the uptake of GABA into the neurons by inhibiting GAT-1
- Gabapentin enhances the GABA release from synaptic vesicles.

## 55. Ans (a)

| S.NO. | NECROSIS | APOPTOSIS |
|---|---|---|
| 1. | It is un-programmed cell death. It is tightly regulated intracellular program in which destined cells to day. | It is programmed cell death followed by degradation of tissue by hydrolytic enzymes liberated from dead cells |
| 2. | It is pathological in nature | It can be both physiological and pathological |
| 3. | It involves inflammatory reactions | Generally, inflammatory reactions are not present |

### ANAPLASIA

Anaplasia is lack of differentiation and is a characteristic feature of most malignant tumours. Morphological and functional alteration/ changes date are different from of nor- mal cells

### NEOPLASM

The term neoplasm refers to an abnormal growth of tissue caused by the rapid division of cells that have undergone some form of mutation.

## 56. Ans (b)

The ventricles are four cavities within the brain namely two lateral ventricles, the third ventricle, and the fourth ventricle. Each ventricle contains a capillary network called a choroid plexus, which forms cerebrospinal fluid (CSF) from blood plasma. The ependymal cells that forms the choroid plex uses of the ventricles secrete cerebrospinal fluid.

## 57. Ans (d)
### EFFECTS OF METABOLIC ACIDOSIS

```
                        Metabolic acidosis
                                |
              ┌──────────── Anion gap ──────────────────┐
         Normal                                   Increase
      ┌──────┴──────┐                        ┌────────┴────────┐
    Gut          Renal                   Exogenous        Endogenous

1. Diarrhea    1. Renal tubular acidosis  1. Salicylates    1. Lactic acidosis

2. Fistulae    2. Carbonic anhydrase      2. Methanol       2. Ketoacidosis
                  inhibitor
                                          3. Paraldehyde    a. Diabetic,
3. Ileal loop  3. Post hypocapnia
                                          4. Ethylene       b. Starvadion

                                          5. Hyperalimentation  3. Uremia

                                          6. Ketoacidosis ETOH
```

| n → σ* transition | • Saturated compounds containing atoms with lone pair of electrons like O, N, S and halogens are capable of n → σ* transition. |
|---|---|
| n → π* transition | • An electron from non-bonding orbital is promoted to anti-bonding π* orbitals<br>• Compounds containing double bond involving hetero atoms (C=0, CEN, N=0) undergo such transitions. |
| σ → π* transition & π → σ* transition | • These electronic transitions are forbidden transitions & are only theoretically possible.<br>• Thus, n → π* & π → π* electronic transitions show absorption in region above 200 nm which is accessible to UV-visible spectrophotometer. |

## 102. Ans (d)

| ABSORPTION AND INTENSITY SHIFTS | |
|---|---|
| **Bathochromic shift (red shift)** | • When an absorption maximum of a compound shifts to longer wavelength, it is known as bathochromic shift or red shift |
| **Hypsochromic shift (blue shift)** | • When an absorption maximum of a compound shifts to shorter wavelength, it is known as hypsochromic shift or blue shift. |
| **Hyperchromic shift** | • When absorption intensity of a compound increased, it is known as hyperchromic shift |
| **Hypochromic shift** | • When absorption intensity of a compound decreased, it is known as hypochromic shift |

## 103. Ans (b)

- Molar absorptivity is a measure of the amount of light absorbed per unit concentration.
- Molar absorptivity is a constant for a particular substance, so if the concentration of the solution is halved so is the absorbance, which is exactly what you would expect.
- Let us take a compound with a very high value of molar absorptivity, say 100.000 L mol$^{-1}$ cm$^{-1}$, which is in a solution in a 1 cm pathlength cuvette and gives an absorbance of 1.

$$\epsilon = 1 / cl$$

$$\boldsymbol{\epsilon = A(1\%, 1\ cm) \times MW / 10}$$

## 104. Ans (a)

- IR spectroscopy is used to establish whether a given sample is identical with another or not It is noted that the infrared spectra of two enantiomeric compounds taken under identical conditions are exactly identical IR spectrum cannot Identify the presence of enantiomers as they show similar IR spectrum.
- In this below figure, the dotted and thick lines show the spectra of a pair of enantiomers.

## 105. Ans (a) RADIATION SOURCES OF IR SPECTROSCOPY

| **Incandescent lamp** | • Nichrome wire |
|---|---|
| **Nernst glower** | • Composed of zirconium, yttrium, thorium<br>• Diameter 2 mm, length 30 mm<br>• Provide radiation at 7100 cm$^{-1}$ |

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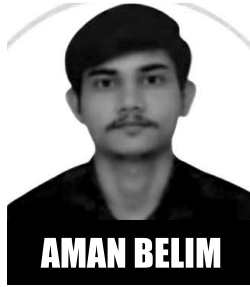
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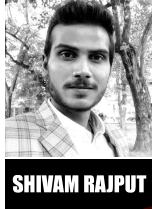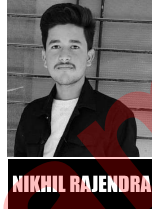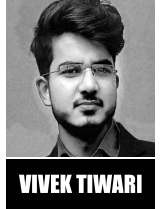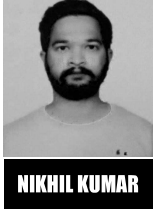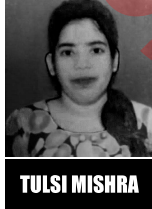
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