



**SUMMER– 15 EXAMINATION**

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**Important Instructions to examiners:**

- 1) The answers should be examined by key words and not as word-to-word as given in the model answer scheme.
- 2) The model answer and the answer written by candidate may vary but the examiner may try to assess the understanding level of the candidate.
- 3) The language errors such as grammatical, spelling errors should not be given more Importance (Not applicable for subject English and Communication Skills).
- 4) While assessing figures, examiner may give credit for principal components indicated in the figure. The figures drawn by candidate and model answer may vary. The examiner may give credit for any equivalent figure drawn.
- 5) Credits may be given step wise for numerical problems. In some cases, the assumed constant values may vary and there may be some difference in the candidate's answers and model answer.
- 6) In case of some questions credit may be given by judgement on part of examiner of relevant answer based on candidate's understanding.
- 7) For programming language papers, credit may be given to any other program based on equivalent concept.



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I. **Solve any EIGHT** : (2 marks each)

**a) Define Hospital Pharmacy. Give its objectives. (1 mark –definition, 1 mark –any 2 objectives)**

Hospital Pharmacy-It is service department of hospital which receives drugs and supplies, stores, dispenses them to inpatients and outpatients under supervision of qualified registered pharmacist.

Objectives of Hospital Pharmacy:

1. To professionalize the functioning of pharmaceutical services in a hospital.
2. To ensure the availability of the right medication at the right time, in the right dose, at the minimum possible cost.
3. To teach the hospital pharmacist about the philosophy and ethics of hospital pharmacy and guide them to take responsibility of professional practice.
4. To strengthen the management skills of hospital pharmacist working as the head of the department
5. To strengthen the scientific and professional aspects of practice of hospital pharmacy such as his consulting, teaching role and research activities.
6. To utilize the resources of hospital pharmacy for the development of profession.
7. To attract the greater number of pharmacist to work in the hospital.
8. To promote the payment of good salaries to pharmacist.
9. To establish drug information services
10. To participate in research projects carried out in hospital.
11. To implement decisions of Pharmacy and Therapeutics Committee.



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**b) What do you mean by SWFI &WFI.( 1 mark each)**

SWFI – Sterile water for injection -

It is sterile, nonpyrogenic, and contains no bacteriostatic or antimicrobial agents, store in suitable container of glass or other material and sealed.

WFI –Water for injection- It is apyrogenic distilled water intended for use in the preparation of medicines for parenteral administration.

**c) Define PTC. Give its composition (1 mark –definition, 1mark-composition)**

Pharmacy and Therapeutic Committee- The hospital as an organization, responds to rational use of drugs by erecting a committee, which formulates the policies regarding the therapeutic use of the drugs.

Composition of PTC.

It includes

1) 3 Physician-

-General medicine

- General Surgeon

- Anesthetist

2) Pharmacist

3) Nurses

4) Administrator.

**d) What is Hospital formulary (1mark).Give its need .(any 2 needs for 1 mark )**

**Define formulary**

It is a continually revised compilation of pharmaceuticals & medicine used in hospital by medical staff that reflects clinical knowledge.

**OR**



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It is important document of the hospital containing a collective list of drugs which is used by interne & fellow doctors reflecting current clinical judgement.

**Reason for need of it (any 2)**

1. The competition in marketing practices or the pharmaceutical industry.
2. The increased number of new drug in market.
3. Increased influences of Advertisement, unscientific and drug literature.
4. The increased complication of untoward effect of new drug.
5. The demand of public that health profession provide best possible service or care at the lowest possible cost.

**e) Give ideal properties of surgical dressings.(any 4 properties – 2 marks ,1/2 mark each)**

- 1.It should be non-adherent to skin surface.
- 2.It should have the maximum absorbing capacity.
- 3.It should be cheap and non-inflammable.
- 4.It should be porous to water vapour, otherwise the sweat from the surrounding skin will accumulate and delay the healing.
- 5.It should be free from foreign substances that cause tissue reactions such as allergy or hypersensitivity.
- 6.It should be capable of being sterilized by conventional methods.
- 7.It should be unaffected by industrial solvent such detergents and oils.
- 8.It should have sufficient tensile strength.
- 9.It should be smooth on both the surfaces
- 10.It should have constant physical properties under normal conditions of storage and use.



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**f) Give any two applications of computer.(any 2 applications -1 mark each)**

1. **Maintenance of records:** Computer can store data i.e records .In pharmacy various records like patient information, his medication history, current treatment and financial records are store. It includes patient ‘s name, age ,sex ,room number, allergies diagnosis and special precautions .The computer can store all information in the files like physician’s name, Direction ,drug interaction etc.
  
2. **Inventory control:**
  - a)To detect the items those have reached minimum order level.
  - b)To prepare a list of drugs to be ordered and their quantities.
  - c)To prepare purchase orders and avoid duplicate orders.
  - d)To detect infrequently purchased item for possible return or elimination from pharmacy drug supply
  - e) to produce periodic summery and inventory control statistics.

There are two types of inventory controls-periodic inventory control system and perpetual inventory control system.
  
3. **Medication monitoring & retrieval :** To evaluate therapeutic action and adverse effect of any drug ,hospital pharmacist take the help of pharmacokinetics and non-pharmacokinetics applications. This is called medication monitoring.MEDIPHOR and PAD these two software are used for Medication monitoring purpose.
  
4. **Drug Information:** Computers are very helpful to give drug information to clinical pharmacist. It is helpful to the chemist and pharmacist for drug design and to formulate a new drug molecule. It also guides the patient because full text data base of drugs in American Hospital Formulary is available on CD.Also MICROMEDEX – like software



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provides information on drugs ,their identification ,poison ,emergency drugs etc. in a compact disc

**g) What advice will you give to patients about following drugs(1 mark each)**

**(i) Antacid Tablet**

**(ii) Diazepam**

i)Antacid Tablet- Do not swallow but chew it

ii) Diazepam-This drug may cause drowsiness so do not work with dangerous machinery and do not drive a heavy vehicles and do not drink alcoholic beverages.

**h) Define allergy, antidote.(1 mark each)**

**Allergy** – Allergy is an adverse response to a foreign substance resulting from previous exposure to that substance

**Antidote** – Antidote is a medicine or substance used to counteract the effects of Poison.

**(i) Give normal physiological value of (1 mark each)**

**i) Blood Cholesterol:** Normal value: 150 -250mg%(1 mark)

**(ii) ESR**

Normal Value:- Westergren Method: Male 5-15mm at end of one hour

Female 5-20 mm at end of one hour

Wintrobe Method : Male 0-9mm at end of one hour

Female 0-20mm at end of one hour



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**j) Define : i) Adverse drug reaction ii) idiosyncrasy (1 mark each)**

**i) Adverse drug reactions (ADR)** definition - “ Any response to a drug which is noxious and unintended, and which occurs at doses used in man for prophylaxis, diagnosis or therapy”.

ii) **Idiosyncrasy**: The term idiosyncrasy (Greek idios means ‘one’s own and synkrisis, a mixture together’) has long been used to denote both quantitatively and qualitatively abnormal drug response.

OR

It means unusual, bizarre or unexpected drug effects which cannot be explained or predicted in an individual recipient.

**k) What is Universal antidote? Give its composition. (Universal antidote ½ mark, composition.- 1 ½ mark)**

Universal antidote is used in cases where the nature of the poison is not known or a combination of poisons is administered.

Composition and use of Universal antidote

Sr. No.	Ingredients	Quantity	Use
1.	Powdered charcoal	2 parts	Adsorbs alkaloids
2.	Magnesium oxide	1 parts	Neutralizes acids
3.	Tannic acid	1 part	Precipitates alkaloids

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1) Define drug dependence and drug abuse. (1 mark each)

**Drug dependence**-“A state of psychic and also sometimes physical resulting in which the user has a compelling desire to continue taking the drug either to experience its effect or to avoid the discomfort of its absence”.

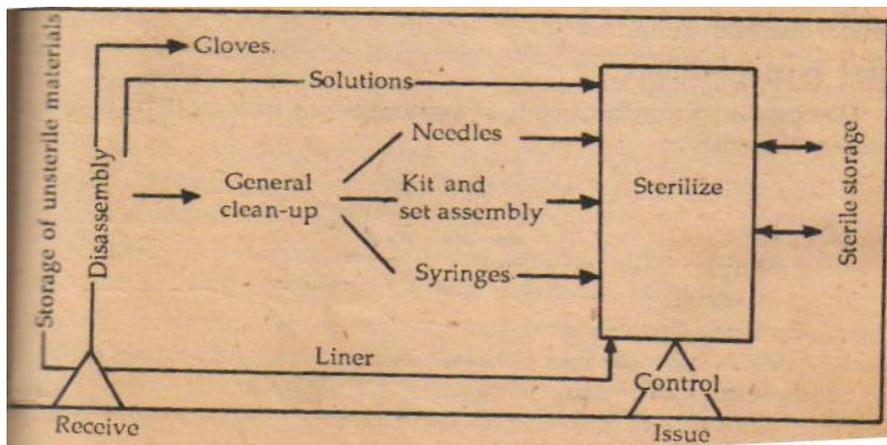
**Drug abuse** - Drug abuse is defined as the consumption of a drug apart from medical need or in unnecessary quantities’. OR

Drug abuse is the persistent or sporadic excessive drug use inconsistent with, or unrelated to medical practice.

Q 2 Attempt any FOUR : (3 marks each)

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a) Draw and explain layout of central sterile services. (2 marks – layout, 1 marks – explanation)



It consists of a series of working stations in a dirty, non-sterile area which are separated from the sterile area by autoclaving and different sterilizing equipment. In the layout, a sterile area is established having different sterilizers.



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- i) Once entrance receive Non sterile items like gloves, syringe and needle ,rubber gloves ,surgical instrument and dressing ,urine and blood collection set ,solution.
- ii) The Non sterile item then passes for sorting and disassembly purpose
- iii) It goes for general cleanup process for washing purpose, powdering process for gloves and all this assembled according to types of items. Linen material goes to the linen storage section
- iv) Then these items pass through partition zone to sterile area for sterilization in different sterilizer.
- v) Finally the sterilized item comes to the sterile storage area.
- vi) From this area, these items are issued or distributed to various departments through clear area.

The purpose of such layout is to minimize cross flow of non sterile item with sterile item ,there by eliminating the possibility of error of contamination.

**b) Give functions and scope of PTC. (any 6 -1/2 marks each)**

**Functions and scope of PTC**

- 1) To advise the medical staff and hospital administration in matters related to the use of drugs
- 2) To establish and develop suitable educational schemes to improve the professional staff on the matters related to the use of drugs.
- 3) To develop and compile formulary of drugs and prescription accepted for use in hospital. It also minimizes the duplication of the same type of drugs or products.



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- 4) To study problems related to the distribution and administration of drugs used in hospital.
- 5) To review adverse drug interaction occurring in hospital.
- 6) To initiate and promote studies on drug use and review the results of such studies.
- 7) To recommend about the drugs to be stocked in hospital patient care areas.
- 8) To advise the pharmacy in the implementation of effective drug distribution and control procedures.

**c) Explain role of pharmacist in patient counselling.( Any 3 points -3marks ,1 mark each)**

1) Name of the drug and its action- The pharmacist should inform the patient about not only the name of drug but also its other name .He must explain the use of that drug and action on the body. In brief he has to explain how the drug acts?

2) Route of administration- It is important for the pharmacist to inform the patient about the route of administration of drug. Whether the is to be taken orally or it is to applied locally or to be used into eye, ear or nose or inserted rectally or vaginally. The pharmacist should be sure that the patient understands how to use ophthalmic preparations, and suppositories.

3) Time of administration- The pharmacist should instruct the patient when to take the medication e.g. some drugs should be taken on empty stomach i.e. about 1 hour before meal or 2-3 hours after meal to ensure adequate absorption of drug. The patient should be provided for the medication calendar.

4) Duration of therapy- The pharmacist should encourage the patient to continue taking the medicine for the prescribed duration of the treatment. He should explain that the course of treatment must be completed to achieve best results.



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5) Storage of drugs- The pharmacist should instruct the patient regarding storage of drugs, those these are labeled on the container. The patient should advise to store the drugs in a separate cabinet where children will not reach.

6) Adverse effects of drugs- The patient should be informed about the adverse effects of the drugs, but it not necessary to inform about all the side effects e.g .Headache. The patient should be informed of those side effects which will allay fears and help him to avoid injury to himself e.g. change in color of urine, drowsiness.

7) Restrictions- The patient should be informed well that he should avoid certain drugs and foods during the therapy.

E.g. Restriction of tyramine containing food in patients on MAO inhibitor therapy

8) Allergic reactions- Before dispensing the drugs like penicillin or sulphonamide , the pharmacist should ask the patient about his allergic reactions in the past. It helps in avoid in further complications of treatment.

9) Removal of drug from package- The patient is not familiar with the packing of the product, as the pharmacist. Hence, the pharmacist should demonstrate the method of removal of drug from the package to the patient so that he can handle it properly.

10) Refill information- The patient should be informed the patient verbally, whether the prescription is refillable, or not. If it is, then for how many times it may be refilled and length of time during which it may be refilled. If it is not refillable, he should be instructed such, so that he may contact the physician for the same drug if needed.

**d) Define Angina pectoris. Give its pathophysiology.(Definition -1 mark,  
Pathophysiology- 2 marks)**

**Definition** -Angina pectoris is a most frequent symptom of ischemic heart disease & results from a temporary relative imbalance of oxygen demand & supply in the heart.



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**Pathophysiology :**

In angina there is temporary relative imbalance of oxygen demand & supply in the heart. The oxygen consumption of myocardium increases with increased heart size, heart rate, Myocardial contractility.

The primary cause of Angina pectoris is supposed to be arteriosclerosis of large coronary arteries, ulceration, and hemorrhage of coronary arteries. It may also result from reduced oxygen content of the coronary blood as in anemia, anoxia or smoking.

It may be due to increased demand as in fever, thyrotoxicosis..

**e) Define clinical pharmacy. Give services of clinical pharmacist.(1 mark –Definition,2 marks for any 4 services-1/2 mark each)**

**Definition of Clinical pharmacy** – Clinical pharmacy is a new born discipline that carries traditional hospital pharmacist from his product oriented approach to more healthier patient oriented approach, so as to ensure maximum well-being of the patient while on drug therapy.

OR

It is the branch of pharmacy which is concerned with various aspects of patient care & deals not only with dispensing of drug but also advising the patients on safe & rational use of drugs.

**Services of Clinical pharmacy –**

1. **Medication history**- it includes past and present of prescription and non – prescription drug,dietarysupplements,dietaryhabbits,drug and estimate of patient compliance with the drug therapy.



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2. **Monitoring drug therapy-** it includes evaluation of patient pharmacokinetics and pharmacodynamics parameters ,lab. Findings medical problems and communicating relevant findings to physician.
3. **Participation in ward rounds-** The clinical pharmacist with physicians should participate in ward rounds, observe individual patient and decide the drug therapy.
4. **Drug information-** The clinical pharmacist establish drug information center. The drug info. Is available at this center and utilized suitably. This data is send to physician as per their requirements.
5. **Patient counseling-** it involves providing information to the patient about drug therapy and illness. The pharmacist acts as resource for information about health promotion and disease prevention.
6. **Participation in new drug investigation-** clinical pharmacist along with physician participates in investigation of new drugs. Data of this investigation is complied, analysed and maintained at drug information center.
7. **ADR management-** Along with physician clinical pharmacist's activity is involved in reporting of management of ADR.

**f) Define Bioavailability .Give factors affecting on it.( Definition – 1mark,2 marks for any 4 factors-1/2 mark each)**

Bioavailability- Bioavailability may be defined as the rate at which and extent to which the drug reaches the systemic circulation in the active form. **OR**

The degree to which a drug is absorbed from the drug product into the body or to the site of action.



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**1.Physical state of drug:-**

\*Liquids are better absorbed than solid medicaments.

\*Aq solution are more quickly absorbed than oily solution.

Soluble medicaments like insulin suspension is more readily absorbed than insoluble protamine zinc insulin suspension.

**2. Particle size :-**Smaller particle size provides greater surface area of drug thus improving its

Absorption. Small particle size is useful in absorption of corticosteroids and antibiotics like chloramphenicol, griseofulvin and oral anticoagulants.

**3.Cocentration:-** Higher conc of a drug is better absorbed from the gut by passive diffusion.

**4.Dissolution rate.:** The absorption of a drug takes place only when the drug is in solution form.

Solution >suspension>powder> capsules>Tablets.

**5.Absorbing surface:** Larger the surface area of absorbing surface, more will be the absorption.

As compare to GI mucosa and pulmonary endothelium ,skin is the poor absorbing surface.Absorption of drug from mouth cavity is faster because absorption of drug from vascular membrane is rapid.

Also drugs can be better absorbed from small intestine than from stomach, due to large surface area.

**6.Functional integrity of GIT :-**Absorption of drug from GIT Decreased by increasing peristalsis activity . Thus anticholinergic drug reduces gut motility and affect the absorption.

**7. Lipid Solubility:** If a drug is to be absorbed it has to pass through cell membranes of the mucous coat of GI and then into circulation via the blood capillaries or lymph channels.As the



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cell membrane of GIT is lipid in nature, The rate and degree of absorption drug which is to be pass through this is dependent on its solubility.

**9. Degree of ionization:-** Some substances like ethanol are unionized and others like Ach are highly ionized in the gut. Majority of drugs are either weak acids or weak bases and at physiological PH-7.4 they exist partly in the unionized form and partly in the ionized form. The absorption process is usually proportional to the lipid solubility of the drug. The absorption of Unionized form is greater because it is more lipid soluble than ionised form.

**10. PH of drug:** Acidic drug are rapidly absorbed from stomach because in the acidic medium of stomach these remain in the unionised form. e.g. Salicylates and Barbiturates.

Basic drugs are absorbed from small intestine because of alkaline environment it enhances the absorption in Unionised form e.g.Pethidine Ephedrine.

**11.Effect of GIT fluid** : Any disturbances of PH of GIT fluid affect absorption which inturn change the bioavailability. E.g. Salicylate and barbiturates ( acidic drug) remain in unionized form in stomach, in acidic PH of stomach, they are rapidly absorbed.

Basic drugs like pethidine, ephedrine are only absorbed in small intestine, as these drugs exist in un-ionised form in alkaline environment.

**12. G.I. Transit time** :The motility of the stomach is important to the rate at which orally administer drug is passed on to the intestine. Delayed gastric emptying reduces absorption of orally administered aspirin. Food also affects gastric emptying time. Absorption of amoxycillin ,ampicillin and cephalixin reduced in presence of food . This is due to enhanced gastric emptying.

**13.First –pass effect** : Orally administered drugs go to the systemic circulation via hepatic portal system , which first present the drugs to the liver . Thus the entire absorbed dose of the drugs is exposed to the liver during first pass through the body. The drug, if it is rapidly metabolized in the liver, a small fraction only will reach the systemic circulation. This is known as first-pass affect and may cause significant reduction in bioavailability. Route of



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administration highly affects first-pass metabolism effect. Bioavailability of propranolol, oxyphenbutazone, chlorpromazine, and aspirin undergo first pass effect.

**14. Diseased state:** Absorption of drug may be affected by certain conditions like malabsorption, achlorhydria, cirrhosis of liver, thyrotoxicosis.

**Q.3 Attempt any FOUR ( 3marks each)**

**12Marks**

**a) Define Hospital. Give its functions.( definition 1mark,any 4 function carries ½ mark each.)**

**Definition:** The hospital is defined as ‘an institution of community health’ its functions embrace the entire spectrum of medical care-prevention, diagnosis, therapy, rehabilitation, education and research.

OR

The hospital is complex organization utilizing specialized scientific equipment and functioning through a team of trained staff educated to the problems of modern medical sciences. All these are co-ordinated together for the common purpose of restoration and maintainance of good health.

**Functions of Hospital:**

The main functions of the hospital are:

- 1. Patient care :** It includes services for diagnosis ,prophylaxis and treatment of diseases to the sick or injured patients. It is a center of community health and contributes a great deal to preventive and social medicine.
- 2. Public health :** The hospitals are required to support all the activities carried out by various public health and voluntary agencies such as immunization programme , blood donation camps, social and economics rehabilitation , health education etc. by providing facilities and advice.
- 3. Medical research:** Research is an important activity in the hospital that helps in developing the new methods of treatment and improving the hospital services. Some of the common areas of research in the hospital are development of new techniques in surgery, laboratory diagnostic procedures, evaluation of investigational drugs in diseases.



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**4. Educational training:-** This facility , particularly for medical students , pharmacist , nursing , medical technologist and allied health professional helps to fulfill their curriculum requirement.

Hospital also educates the general public through lectures and demonstrations on the preventive aspects of common and serious diseases.. Hospital provide the methods by which the persons can work together in groups with the object of care of patient and community.

**5. Counseling and patient advice:** It is a modern concept adopted in big hospitals for the well-being of the patients. During these counseling sessions pharmacist educate people on communicable diseases, epidemics and family welfare etc.

**b) What is satellite pharmacy service? Give its location and advantage.**

**( Definition – 1 mark, Location- 1 mark, Advantage(any 2)- 1/2 mark each)**

Satellite pharmacy services are the sub- pharmacies which receive their supplies from main pharmacy. In hospital, where the main sections of pharmacy such as storing, manufacturing, dispensing are separated from each other it is advisable to develop satellite pharmacies at the nursing station.

**Location:** Satellite pharmacies are located on each floor of the hospital. This concept is being adopted in very big hospitals which have multistoried separate buildings in a single premises.

**Advantages:**

1. Availability of pharmacist to the patient and nursing for counselling.
2. Pharmacist at nursing station take patient drug history and monitor patient for drug reaction
3. Drug distributed efficiently.
4. Drug distribution time can be reduced.
5. No error in drug distribution.

**c) Give the uses of following ( 1 mark for each)**

**1) CT scan-** CT stands for computed tomography. It is an advances technique used for morphological examination of neurological organs, head, eyes, neck, spinal cord etc.



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2) **Surgical gloves-** It is an essential barrier between patient and surgeon, serving to protect both from infection. It also essential to wear surgical gloves during manufacturing of pharmaceutical products particularly parenteral products to avoid contamination of the product.

3) **Autoclave-** It is an instrument used to carry out sterilization of surgical instruments, glassware, glass syringes, needles, surgical dressings, surgical cloths, plastic IV sets, rubber gloves, rubber tubing etc.

**d) Define Patient non- compliance. Give the role of pharmacist in it.**

**(Definition – 1 mark, role of pharmacist -2 marks for any four points, ½ mark each)**

**Definition** - Patient non- compliance means the patient is not following the directions for use of prescribed drugs. He is at fault for inappropriate use of medication.

**Role of the pharmacist in improving compliance-**

With the use of various techniques of communication (verbal, written or audio- visual) the pharmacist should inform, educate and counsel patients about the following items for each drug

1) **Name of the drug and its action-** The pharmacist should inform the patient about not only the name of drug but also its other name .He must explain the use of that drug and action on the body. In brief he has to explain how the drug acts?

2) **Route of administration-** It is important for the pharmacist to inform the patient about the route of administration of drug. Whether the is to be taken orally or it is to applied locally or to be used into eye, ear or nose or inserted rectally or vaginally. The pharmacist should be sure that the patient understands how to use ophthalmic preparations, and suppositories.

3) **Time of administration-** The pharmacist should instruct the patient when to take the medication e.g. some drugs should be taken on empty stomach i.e. about 1 hour before meal or 2-3 hours after meal to ensure adequate absorption of drug. The patient should be provided for the medication calendar.

4) **Duration of therapy-** The pharmacist should encourage the patient to continue taking the medicine for the prescribed duration of the treatment. He should explain that the course of treatment must be completed to achieve best results.



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5) **Storage of drugs**- The pharmacist should instruct the patient regarding storage of drugs, those these are labeled on the container. The patient should advise to store the drugs in a separate cabinet where children will not reach.

6) **Adverse effects of drugs**- The patient should be informed about the adverse effects of the drugs, but it not necessary to inform about all the side effects e.g. .Headache. The patient should be informed of those side effects which will allay fears and help him to avoid injury to himself e.g. change in color of urine, drowsiness.

7) **Restrictions**- The patient should be informed well that he should avoid certain drugs and foods during the therapy.

E.g. Restriction of tyramine containing food in patients on MAO inhibitor therapy

8) **Allergic reactions**- Before dispensing the drugs like penicillin or sulphonamide , the pharmacist should ask the patient about his allergic reactions in the past. It helps in avoid in further complications of treatment.

9) **Removal of drug from package**- The patient is not familiar with the packing of the product, as the pharmacist. Hence, the pharmacist should demonstrate the method of removal of drug from the package to the patient so that he can handle it properly.

10) **Refill information**- The patient should be informed the patient verbally, whether the prescription is refillable, or not. If it is, then for how many times it may be refilled and length of time during which it may be refilled. If it is not refillable, he should be instructed such, so that he may contact the physician for the same drug if needed.

**e) What is Drug –food interaction? Explain with example.**

**(Drug –food interaction- 1 mark, for any 2 examples -1 marks each)**

Food affects the absorption of the drug. It may be attributed to

- 1) Dilution of the drug
- 2) Adsorption or complexation of drug
- 3) The alteration of gastric emptying

Examples-



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- 1) Food reduces the absorption of aspirin, isoniazide, tetracyclines, benzylpenicillin, amoxicillin, Ampicillin, levodopa and Rifampicin
- 2) Food increases the absorption of hydralazine, nitrofurantoin, lithium citrate, riboflavin, carbamazepine, metoprolol, propranolol, spironolactone,
- 3) Iron absorption is reduced if food has been taken within the previous two hours. On the other hand, nausea is more likely if iron is taken on empty stomach so iron tablets are often given with food.
- 4) Nitrofurantoin is given with food to avoid GIT irritation.
- 5) Meals containing high fat increase the absorption of fat soluble drug Griseofulvin. Fat containing drug increases degree of ionization of Griseofulvin, so increases its absorption.
- 6) The diuretic effect of tea takes place rapidly if given before meals but diuresis is delayed if it is given after food.
- 7) The absorption of nitrazepam, glibenclamide, metronidazole, oxazepam, theophylline is unchanged by food.
- 8) Monoamine oxidase (MAO) is an enzyme which breaks down catecholamine's such as norepinephrine. When the enzyme is inhibited, there are increased levels of norepinephrine in adrenergic neurons. Thus, MAO inhibitors are used as antihypertensive. Certain food like cheese, chocolate, alcoholic beverages, liver, yeast extract contain tyramine. Tyramine is metabolized by MAO. When the patient being treated by MAO inhibitors also take tyramine containing food, tyramine reaches the systemic circulation causing severe hypertension.
- 9) Milk reduces absorption of tetracycline by forming an insoluble complex.

**f) Define poison. Give its classification.(Definition – 1 mark, Any two classification – 2 marks, each carries 1 mark)**

**Definition-** A poison is defined as any substance which when administered, inhaled or swallowed or applied locally causes deleterious effects on the body.



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**Classification-**

Depending upon mechanism of action of poison, these are classified as

- 1) **Corrosives**-(any one example)
  - a) Strong acids- sulphuric acid, nitric acid, hydrochloric acid
  - b) Organic acids- oxalic acid , carbolic acid
  - c) Concentrated alkalies- caustic potash, caustic soda, carbonates of sodium, calcium and potassium
- 2) **Irritants**- (any one example)
  - a) Inorganic: 1. Non- metallic- Phosphorous, chlorine , bromine, Iodine  
2. Metallic- Lead, Mercury, copper, zinc, arsenic , manganese
  - b) Organic: 1. Animal origin- Snake, scorpion, Insects, Cantherides  
2. Vegetable origin- Ergot aloe, capsicum, castor oil seeds etc.
  - c) Mechanical- Powdered glass
- 3) **Neurotics**-(any one example)
  - a) Cerebral poison- opium , sedatives and hypnotics, insecticides, cocaine and hyoscyamus
  - b) Spinal poisons- Nux vomica
  - c) Peripheral poisons- curare alkaloids, conium
- 4) **Cardiac**- (any one example)

e.g. Digitalis , stropanthus, aconite, tobacco
- 5) **Pulmonary depressants**- Substances acting on lungs  
e.g. Gases such as carbonmonooxide, coal gas
- 6) **Miscellaneous**- Analgesics, antipyretics, stimulants, antidepressants, antihistamines, hallucinogens.

**Q.4 .Attempt any FOUR (3 marks each)**

**12 Marks**

**a) Explain the responsibilities of hospital pharmacist in relation to the patient care**

**(Any 6 points, each point carries ½ mark)**

**Direct patient care**

1. He obtains patients medication history and gives the information to the physician



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- 2.He takes responsibility to available medication at right time in right dose at reasonable cost assuring quality.
3. Patient monitoring- The complete drug therapy of the patient for its effectiveness, side effects, toxicities, allergic reactions is monitored.
4. Patient counseling- He helps in counseling the patient about self-administered drugs and discharge drugs.
5. Selection of drug- He assists the physician in selection of drug, dose regimen, schedules, and the time for drug administration.
6. He participates in cardiopulmonary emergencies.

**b) Enlist methods of drug distribution in hospital Give advantages and disadvantages of mobile dispensing unit. ( For methods of drug distribution - 2 marks, Advantages- 1/2 mark, disadvantages- 1/2 mark)**

**Methods of drug distribution in hospital by 2 ways:**

- 1) Out patient
- 2) In patient

Drug distributed to inpatient in the following way:

- a) Individual prescription order system
- b) Floor stock system
  - 1] Charge floor stock drugs
  - 2] Non charge floor stock drugs
    - Drug basket method
    - Mobile dispensing unit
- c) Combination of above two methods
- d) Unit dose dispensing
  - 1) Centralized unit Dose dispensing
  - 2) De-centralized unit Dose dispensing



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**Advantages of Mobile dispensing unit-(any 1 advantage-1/2 mark )**

1. The deteriorated, outdated and non-approved drugs and drug samples may be removed quickly through the routine checking of the medicine cabinets .Thus it eliminates the drug returns.
2. The pharmacist is available for spot consultation by the clinical and nursing staff.
3. Ready availability of required drugs

**Disadvantages Mobile dispensing unit—(Any 1 Disadvantages-1/2 mark )**

- 1.More load on pharmacist.
2. Less involvement of nursing incharge.
- 3.Required proper drug storage facility at nursing station.

**c) Explain the importance of Computers in Inventory control.( Any 3 points, each carries 1 mark)**

The computer can be effectively used for purchasing and inventory control in the hospital pharmacy as follows:

- a) Maintenance of perpetual inventory control-** Whenever an item is added to stock or removed from stock, immediately the position of the stock can be updated by the computer. This operation of the computer is intimately linked to other operations such as receipt of goods, dispensing of goods, billing of goods, return of goods, etc.
- b) Maintaining the inventory records-** For annual auditing of the pharmacy department, records of numerous items are required to be typed laboriously. This can be overcome by use of computer through perpetual inventory control and these records can be made ready for inspection at any time when needed.
- c) Calculation of the inventory-** the computer can be used for calculating the value of each item recorded and these values can be printed out. The A-B-C analysis of items recorded can be done on the basis of their volume and cost.
- d) Automatic updating of the price-**The computer can be effectively used whenever there are changes in the prices of items recorded
- e) Evaluation of Demand-** The requirement of any item in the pharmacy can be assessed by analyzing the movements of various items from stock within a period of one year.



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**OR**

**(3 mark)**

1. **Periodic inventory control method-** in this method quantity of drug available in stock are manually checked. These are then compared with the minimum stock level & maximum stock level maintained on the computer. When the drug level reaches the minimum stock level purchase orders are placed by using computer.
2. **Perpetual inventory control method** - in this method computer maintains running balance of all the drugs in stock. All the drugs are entered in database when new stock is received by pharmacy. Computer adds this to the initial stock & reflects current available stock. The quantities of drugs leaving the pharmacy are entered in the computer. Computer subtracts this from the initial stock & reflects current available stock. Whenever the drug level reaches the minimum stock level purchase orders are placed by using computer.

**d) Give pathophysiology and manifestation of Rheumatoid arthritis.**

**(Pathophysiology- 1 ½ mark, Manifestation -1 ½ mark)**

Rheumatoid arthritis is a chronic disorder characterized by inflammation of connective tissues.

**Pathophysiology:**

Rheumatoid arthritis is an autoimmune disease. In these diseases, body's immune system no longer accepts certain body proteins and reacts as if they were foreign antigen and produces antibodies against them. It is observed that patient's body considers human gamma globulin (IgG) as the antigen and produces antibodies against them, known as 'Rheumatoid factors'. The antigen reacts with antibody to form immune complex, which then reacts with complement. Complement is a series of proteins, which helps to stimulate the inflammatory process. Thus, the immune complex reacts with the complement in the joints, which leads to the inflammatory response.



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**Manifestation (any 3- 1/2 marks each)**

- 1) Fatigue, anorexia, weight loss and fever
- 2) Inflammation of peripheral joints, most frequently the small joints of hand and feet, and the wrists, larger joints may also be involved.
- 3) Morning stiffness is a common symptom. The stiffness generally lasts more than 30 minutes and may last for many hours.
- 4) Chronic inflammation of joints results in erosion at the margins of the bones.
- 5) Deformities may develop, mainly of the fingers and neck etc. Joints may be ankylosed with complete loss of motion.
- 6) Around 20- 30 % patients show formation of rheumatoid nodules. They occur commonly in the elbow or along the extensor surface of forearm.
- 7) Inflammation of organs than joints like heart, lungs, eyes, may also occur.

**e) Define ADR. Give its classification.(Definition -1 mark, classification-2 marks)**

**Definition-** Adverse drug reactions (ADR) - “ Any response to a drug which is noxious and unintended, and which occurs at doses used in man for prophylaxis, diagnosis or therapy”.

**Classification of ADRs:**

**A) Predictable ADRs:**

1. Excessive Pharmacological effect
2. Secondary Pharmacological Effects,
- 3.Rebound response on discontinuation

**B) Unpredictable ADRs:**

1. Allergic drug reaction and Anaphylaxis
2. Idiosyncrasy,
3. Genetically determined Toxicities
4. Toxicity following drug withdrawal



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**f) Describe mechanism of drug absorption.( Each mechanism carries 1 ½ mark)**

The absorption of a drug may be either direct or indirect but it involves the passage of a drug across cell membrane. The following mechanisms occur in the process of absorption.

1. **Passive Transport:** It means that a drug is transported across the cell membrane without utilizing the energy. (Also called as simple diffusion). The rate of transfer of substance is proportional to the concentration gradient across cell membrane. The drug molecules penetrate the cell membrane either by way of passage through aq. Pores in the membrane or by dissolving in the membrane substance. Both fat soluble and water soluble molecules of small size may cross the cell membrane by simple diffusion.
- 2 . **Active Transport:** This process requires energy. In this process the carrier molecule combines with a drug molecule, this complex then diffuses through membrane and dissociates into carrier and drug molecule on other side of the membrane .after this the carrier returns to the original side of the membrane.

**Q 5 Attempt any FOUR (3 marks each)**

**12M**

**a) Give requirement and abilities required for Hospital pharmacist. (any 3 abilities- 1mark each)**

**The hospital pharmacist should possess following abilities:**

**1. Administrative ability-**Hospital pharmacist should be thoroughly familiar with organization of hospital, with staff and with appropriate channel of communication. Hospital pharmacist should be capable of planning and integrating services, budgeting, inventory control, cost-review, cost-effectiveness, audit, maintenance of records and preparation of reports.

**2. Technical ability-** Hospital pharmacist must have ability to use his basic knowledge of effect of drug on biological systems, in assessing drug absorption, distribution, metabolism and excretion. Hospital pharmacist must be knowledgeable in pharmacology, toxicology, pathophysiology, and therapeutics and patient care techniques.



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**3.Manufacturing ability**-Hospital pharmacist must be able to develop formulations not available commercially. Hospital pharmacist should possess an adequate understanding of the principles involved in formulations and preparation of dosage forms.

**4.Research ability**-Hospital pharmacist must be prepared to participate in clinical research initiated by medical staff and to conduct pharmaceutical research himself. Hospital pharmacist must be able to establish database for drugs being used and patients participating in studies. Hospital pharmacist must have ability to collect appropriate data interpret them and make conclusion from data.

**5. Teaching/Training ability**- Hospital pharmacist is responsible for training of new personnel and for carrying out continuous educational programme for pharmacist and pharmacy supportive personnel. Hospital pharmacist must be able to develop well planned and coordinate training programme and able to deliver lectures.

**6. Ability to Control**-Hospital pharmacist must be able to develop quality assurance programme for quality services of pharmacy department and products dispensed. Hospital Pharmacist must be able to develop control programme for distribution of drugs throughout the hospital.

**b)Give objectives of Inventory control. Explain procedure of purchasing.( 1 mark –any 2 objectives,2 marks –procedure of purchasing)**

**There are several objectives of Inventory Control,( any 2):**

1. Minimization of the inventory investment.
2. Determination of The right level of customer service.
3. Balance of supply and demand.
4. Minimization of procurement costs and carrying costs.



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5. Maintenance of an up to date inventory control system.

**1. Purchase request form**-Pharmacist or person authorized by him prepare and fill purchase request form. This form provides information to purchase dept. regarding description, packaging, specifications, price, quantity needed, inventory balanced and anticipated monthly use.

The original copy of this form is sent to administrator for approval. After his approval it is forwarded to purchasing officer. A copy of this form is retained by pharmacist for his record to indicate that the process of procurement is going on.

**2. Quotation invitation**-On the receipt of purchase request form, purchasing officer invites quotations from different suppliers.

**3. Purchase order form**- Purchasing officer scrutinizes the quotations received. He checks the quantity to be supplied in consultation with pharmacist and prepare purchase order form.

Purchase order form consists of many pages ‘snap out’-

First copy-it is sending by post or by hand to supplier.

Second copy- Send to accounts dept. It is held till invoice is received from supplier. It is completed after receiving report from purchase dept. then only payment is done.

Third copy-It is kept with purchasing officer as department file. This copy served as source of information.

Fourth copy-It is kept with Hospital pharmacy dept. This copy is compared with purchase request form for accuracy.

Fifth & Sixth copy\_ These copies serve as receipt report. When goods arrive in full consignment then fifth copy is used. If order is received partially then sixth copy is used and send to account dept.



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Seventh copy- This copy is known as history copy. It is kept by purchasing dept.

**4.Return of goods-** When the ordered goods comes in dept. the quantities and prices are checked. Received goods bill sent to the account section where bill is entered in purchase record register.

**5. Release of payment to supplier.**

**c) Write a note on preparation of formulary. ( 3 Marks)**

The first step in the development of a formulary Is to form PTC. Then they decide on the following.

1.What type of publication is most suitable for the hospital.

- a. A hospital own formulary or
- b. A simple list of drug or
- c. A purchase formulary service

2. Fixation of rules by PTC for admission of formulary.

3. If formulary is to be prepared, decision must be taken on its content.

- a .R<sub>x</sub> writing
- b. Use of drugs.
- c. Table of metric weights and apothecary and household equivalents.
- d.Section on calculation of doses for children.
- e. pharmacological index

4. The type of format of the formulary.



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- a. Size
- b. Loose leaf or bounded
- c. Printed or mimeographed.
- d. Extent of categorization and indexing

**d)What is DIB? Give its importance.(1 mark –DIB, any 4 importance-2 marks ½ mark each))**

Drug information Bulletin: The drug Information Centre may publish a journal or periodical or any booklet about current or amendment information on drugs, Various technical aspects and modernization of hospital practices for all the health professional which is referred as “Drug information Bulletin”

Importance (2 marks)

1. To provide current information to physician, pharmacist ,nursing staff and fellow candidates of all disciplines through bulletin in shortest possible time.
2. It is a link between the DIC and health professional
- 3.It helps hospital staffs regarding recent researches in medical science, pharmacokinetics, pharmacodynamics, adverse effect, drug interaction .
- 4.It may give abstract service for new drug development.
5. It give detail Analysis of drug information to the physician.
6. It also publishes matter in question –Answer session /column in the bulletin.



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e) Differentiate between Drug addiction and Drug Habituation. (6 points carries ½ mark each)

<b>Drug Addiction</b>	<b>Drug Habituation</b>
1. It is a state of chronic or periodic intoxication due to repeated consumption of drug,	1. It is a state resulting from the repeated use of drug.
2. A <u>compulsion</u> to continue taking the drug or overpowering desire	2. A desire <u>but not compulsion</u> to continue taking the drug to improve a sense of wellbeing .
3. A tendency to increase a dose of drug	3. Little or no tendency to increase a dose of drug
4. A psychic , particularly physical, dependence shown by the individual on the effects of the drug ,.	4. Some degree of psychic dependence but absence of physical dependence
5. Withdrawal symptoms are observed	5. Withdrawal symptoms are not observed
6. A harmful effect on individual or society	6. A harmful effect primarily on individual but not on society
.Ex. Morphine , Heroin , Alcohol etc	.Ex. Tea , coffee. etc

f) Give dose of following (1 mark each)

i) **BAL:** Dose. 3-5 mg/kg I.M at the interval of 4 hrs for 1<sup>st</sup> 2 days,

interval of 4-6 hrs for additional 2 days

interval of 6-12hrs for additional 7 days.

ii) **EDTA:** Dose-75 mg/kg 24hrs I.M given in 3-6 divided doses for 5 days may be repeated for a second course after a minimum of 2 days,



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**iii)Penicillamine:** 30mg /Kg body weight upto 2gm per day ,four times a day,in divided dosage.

**Q 6 Attempt any FOUR: (4 marks each)**

**16Marks**

**a)Explain the evaluation parameters of parentals ( Explain any 2 test -2 marks each)**

**1. Sterility test:-**

The product is being tested, filtered through membrane filter, which is then transferred to a sterile media and incubated at definite temp. and period of time. The test result, either +ve or -ve depend on the growth of microorganisms.

Additives like antimicrobials and certain drugs like antibiotics and sulphonamides may produce false results. The effect of such substances antagonise by doing dilutions by penicillase, PABA resp.

The test is performed under aseptic tech. under laminar air flow.

**2. PYROGEN TEST**

Pyrogen are metabolic product of living or dead micro organisms.chemically pyrogens are lipo- polysaccharides, which cause rise in body temp after administration.

Pyrogen are thermostable and soluble in water .They are unaffected by the bactericide and can pass through bacteria proof filter.

The I.P pyrogen test is done on selected healthy rabbits of either sex. It is performed in 2 stages.

**1)Priliminary test:-** It is known as “SHAM TEST” carried on rabbits ,which are being used for pyrogen test for first time or the animal not used from previous 2 weeks, Is done to condition the rabbits.It is performed for 1-3 days by giving a warmed solution of either SWFI or sterile saline at a dose Of 10ml/kg body wt. Recording of body temp prior to 90 min for 3 hrs is done. If any rabbit shows a difference of 0.6<sup>o</sup>c or more then it is not used for the test.



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**2) Main test:-**

It is performed initially on a grp of three rabbits. They are placed into animal holder box. A thermometer is inserted into the rectum. The product being tested is warmed at 38°c then it is injected in in the ear's marginal vein of the rabbit. Before the administration of the product the initial temp, which is the mean temp recorded at 60 and 90 min is recorded. The recording is continued to further 3 hrs at an interval of 30 mins . The max temp is recorded, finally response is calculated by subtracting the initial temp from max temp shown by the animal.

**LAL TEST**

**Limulus ameocyte lysate (LAL)** is an aqueous extract of blood cells (amoebocytes) from the horseshoe crab, Limulus polyphemus. LAL reacts with bacterial endotoxin or lipopolysaccharide (LPS), which is a membrane component of Gram negative bacteria.

If pyrogen or bacterial endotoxins present in the sample to be tested then it is combined with Lysate of horse shoe crab to form coagulase. Coagulase hydrolyze, a specific bond of coagulogen protein, present in the blood and produces clot

**3 .Leaker test.**

It is performed by producing a negative pressure within an incompletely sealed ampule while the ampule is entirely submerged in a deep colored dye solution. A 1% Methylene blue solution is usually used .After releasing the vacuum, the colored dye solution enters the incompletely sealed ampules

**4.Clarity Test.**

Done by using Human Visual inspection under Good light against black and white background. White screen is used foe dark colored particle while black screen is used for detection of light colored particles.



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USP has established microscopic test method for large volume parenteral .It consist of filtering a measured sample solution through membrane filter under ultraclean condition and then counting the particles on the surface of filter microscope.

**b) Explain different sources of drug information. (3 sources for 4 marks)**

**1) Primary sources – (1 Mark)**

Information obtained from basic researches and developments which is published in brief for first time. Information on internet, website, c.d.

**2) Secondary sources –(1 &1/2 Marks)**

Information in the form of abstracts, journals, periodicals, references and official books is called secondary sources.

i) Journals and periodicals – American journal of hospitals pharmacy, Indian journal of hospitals pharmacy, Journal of clinical pharmacology.

ii) Text books – Text book of hospitals pharmacy, clinical toxicology.

iii) Reference books- Remingtons pharmaceutical science, Merk index

iv) Pharmacopoeias – The Indian Pharmacopoeia, British Pharmacopoeia

v) Formularies – national formulary of Indian, National formulary of America.

**3) Tertiary Sources –(1 &1/2 Marks)**

- It include dictionaries, encyclopedias, desk references

- The Chemist and Druggist directory

-Indian Pharmaceutical Guide- which gives the manufacturers or suppliers catalogues and price list.

- Medical register and Directory of Pharmaceutical Chemists.

- Stastical Table And Mathematical table to provide scientific data.

**c) Define surgical dressing. Give monograph of cotton.( 1mark definition , 3 marks for any 3 points including in monograph)**

**Definition** -Surgical dressings - Surgical dressings are the materials which are used for the dressing of wounds as coverings, absorbents, protective or supports for injured or diseased tissues



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1. **Category** : surgical aid.

**2. Description** : It is white, soft, fine filament like hair appearing under the microscope as hollow, flattened and twisted bands, striate and slightly thickened at the edges. It is practically odourless and tasteless

**3. Solubility** : Insoluble in ordinary solvents; soluble ammoniated cupric oxide.

Purified cotton is the hair of the seed of cultivated varieties of Gossypium Hirsutum Linne or of other species of Gossypium (Fam : Malvaceae) freed from adhering impurities, deprived of fatty matter, bleached and sterilized in its final container.

**4. Packaging and Storage** : Packages are in rolls of not more than 500 g of a continuous lap, with light weight paper running under the entire lap enclosed and sealed in a well closed container.

**5. Labelling** : Label bears a statement that the sterility cannot be guaranteed if the package bears evidence of damage or if the package has been opened previously.

**6. Evaluation (official stds) ( any one of the following)**

1. **Fibre Length**: not less than 6.25mm in length and more than 12.5 mm in length

2. **Alkalinity or Acidity** : Thoroughly saturated about 10 g with 100 ml of recently boiled and cooled water, then with the aid of glass rod press out two 25 ml portions of water into white porcelain dishes. To one portion add 3 drops of phenolphthalein and to the other portion add 1 drop of methyl orange. No pink color develops in either portion

3. **Surface active substances**:

To the Shake the 10ml of the solution 30 times vigorously in 10 sec, allow it to stand for 1 min .after 5 minutes the height of froth should not exceed 2 mm above the surface of liquid.

4. **Sinking time** :Pack 5 gm of Absorbent cotton loosely in the basket and drop it at the height of 10mm on the surface of water, contained in a beaker. Should not be more than 10 seconds.

5. **Water holding capacity**: Not less than 23 per gram.



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6.Neps: Spread thin layer 5 g of Ab. cotton for an area of 450 sq cm .uniformly between two glass plate and view by naked eye under transmitted light. Should not be more than 500 neps/gm of absorbent cotton.

7. Water soluble substances : Not more than 0. 5 %

8.Ether soluble substances: : Not more than 0. 5 %

9. Sulphated ash: : Not more than 0. 5 %    10.Loss on drying: : Not more than 8.0 %

**d)What is peptic ulcer? Give its types and pathophysiology.**( 1 mark for peptic ulcer,1 mark type ,2 marks- pathophysiology )

Peptic ulcer (1mark)

A peptic ulcer is an erosion or lesion in a segment of the GI mucosa, typically in the stomach, or the first few centimeters of the duodenum, that penetrates muscular mucosa.

The lining of the stomach and duodenum normally has a barrier of mucous to protect it from acidic digestive juices. If the barrier is damaged, the acid may cause inflammation and lesion of the lining .The erosions or lesions are known as peptic ulcer.

**There are two types of ulcers ( 1mark)**

1) Acute peptic ulcer (stress ulcer)

2) Chronic peptic ulcer (gastric and duodenal ulcer)

**Pathophysiology.( 2 marks)**

-H. Pylori infection may lead to the development of gastritis, in which stomach lining becomes inflamed.

-The bacteria are carried through faeces and saliva and easily spread among people who live in unsanitary conditions.



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-Any condition which decreases the quantity or quality of normal protective mucus barrier, leads to peptic ulcers.

-Long term use of aspirin and anti-inflammatory drugs like ibuprofen , may damage the lining of the stomach . Peptic ulcers increase due to smoking , alcohol and caffeine.

-Genetic factors lead to duodenal ulcers.

-Half the patients with duodenal ulcer show gastric hyper secretion . It is due to increased parietal cell mass, excessive gastrin release during meals, high sensitivity to gastrin.

**e) Give clinical significance of following ( 2 marks each)**

**i) Clotting time : Significance:-**

Prolonged clotting time indicates Hemophilia, haemorrhage, obstructive jaundice, leukemia, presence of circulating anticoagulants, pneumonia, Heparin therapy.

Decreased clotting time may result in intravascular clotting of blood called as Thrombosis and embolism. Clotting time decreases in hyper vitaminosis K

**ii)B.P: Significance:**

Increase in blood pressure above normal is called Hypertension .It increases during excess emotions, atherosclerosis, thyrotoxicosis .High sodium /fat diet intake,glomerulonephritis, cushing's syndrome.

Decrease in blood pressure below normal is called hypotension .Hypotension condition occur in shock, peripheral vasodilation , anemia,haemorrhage.



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**f)What is acute poisoning? Give general treatment of poisoning. (1 mark –acute poisoning,3 marks general treatment)**

**Acute poisoning**-Symptoms appear suddenly soon after consumption of the poison, The symptoms rapidly increase in severity and are followed by death or recovery.

Goal of general treatment for the poisoning is to save life of victim. Following steps are followed:

1. Removal of unabsorbed poison
- 2 Use of antidote
- 3.Supportive care
4. Treatment of general symptoms

**1. Removal of unabsorbed poison:**

Ingested Poison

a).Gastrointestinal Decontamination

- a) Activated Charcoal   b) Gastric Lavage   c) Syrup of Ipecac   d) Diuretics   e)Purgative

b)Contact Poison

- Poison spilt or spread on skin is immediately washed with large quantity of water, saline. Saline is preferred for eye irrigation.
- A triple wash (water, soap, water) is best for dermal decontamination.

c)Injected Poison

- It is removed by making incisions at certain place causing bleeding.



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**2. Use of Antidote:**

a) Non systemic antidote e.g Kaolin and activated charcoal ,Sodium thiosulphate and sodium nitrite

b) Systemic antidote e.g. Dimercaprol(BAL) ,Penicillamine,Di sodium EDTA and Desferrioxamine

c) Universal antidote: is a mixture that contains activated charcoal, magnesium oxide, and tannic acid. All three components neutralize the actions of many poisons. It is intended to be administered to patients who consumed poison that is unknown.

**3. Supportive care:** in poisoning there is possibility of upper respiratory tract infection, to avoid this prophylactic administration of antibiotics is given.

Vitalisation of vital centre like cardiac , Vasomotor and Respiratory centre.

Good nursing care is required to maintain general condition of victim

**4. Treatment of general symptoms:** When poison is unknown the treatment is given according to symptoms.

Symptoms	Treatment
Pain	Morphine
Dehydration	ORS saline
Respiratory Failure	Oxygen therapy
Cardiac depression	Cardiotonics.



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