



SUMMER – 13 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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Q.1 Attempt the following

a) Define any four of the following (Any four definition,1 mark each)

i) 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 extent to which the active ingredient in the drug product is taken by the body in the form in which it is physiologically active.

OR

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

ii) Unit dose dispensing- Unit dose are the medication which are ordered, packaged, handled, administered, and charged in multiples of single dose units containing a pre-determined amount of drug.

iii) Teratogenicity- Certain chemical agents can affect the somatic cells of a developing embryo in such a way that defects are produced in one or another organ system. Thus, drugs or other factors producing deviation or abnormalities in the development of embryo, that are compatible with pre-natal life and observable post-natally are called teratogens.

OR

The administration of certain drugs to pregnant woman, specifically during the first trimester of pregnancy results in foetal abnormalities is called as Teratogenicity.

iv) Non- sterile manufacturing- Non- sterile manufacturing concern with fabrication of dosage forms except parenterals which is carried out according to standards laid down under schedule M and N of D and C act 1945.

v) 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.



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b) Answer any Two of the following (2 Mark each)

i) Requirement of the Pharmacist as per the bed requirement

Bed strength	Number of Pharmacist required
Upto 50 beds	3
Upto 100 beds	5
Upto 200 beds	8
Upto 300 beds	10
Upto 500beds	15

ii) (Defination 1 Mark, Uses 1 Mark)

Crepe bandages- It consist of fabric of plain weave in which the warp is of cotton and wool threads and weft is of cotton threads.

Uses- It is used in the treatment of sprains and strains and other condition which require light support. It is also used for correctional purpose and as compression over paste bandage

The elasticity of the bandages is lost during its use which can be restored by washing the bandage in hot soapy water.

iii) (Composition 1 Mark, Uses 1 Mark)

Composition and use of Universal antidote

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

c) Explain any Two of the following(2 Mark each)

i) Anaphylaxis-It is the most serious type of drug allergic reactions. It is generally due to the immunoglobulin E . Anaphylactic reactions are shown by Penicillin, anaesthetics, dextran, iodine containing compound, Allergy response may be generalized or localized. Generalized anaphylaxis is characterized by



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bronchospasm, circulatory collapse, with hypotention and sometimes skin rash. If it is localized to gut, shows abdominal pain.

ii) Chronic poisoning- The symptoms appear gradually the symptoms may disappear after removal of victim from his surroundings. Poisons can be detected in the ingested substance or stool, vomit and urine of the victim. The main symptoms are chronic ill health malaise, repeated attacks of GI irritation.

iii) C.T.scanner- Computed Tomography use in the morphological analysis of all the organs such as Head, Ear, Neck, Abdomen, Spine, Joints. It is based on the technique of measurement of X-rays passing through the body, which could provide information of all tissues by the X-ray beam . It is multidirectional, data thus obtained could be computed & presented in a conventional form to produce three –dimensional picture.

It is used for objective study with better resolution of organs

It can give images in transverse & vertical planes

d) State the meaning of any four of the following (1 Mark each)

i) Tranquilisers-Drugs that restore the mental activity. These drugs allay anxiety and tension and remove the stress and strain

ii) Carminatives- These drugs help to expel out the gases from GIT, and are used to relieve flatulence and intestinal colic.

iii) Necrosis- The morphological changes indicative of cell death caused by progressive enzymatic degradation; it may affect groups of cells or part of a structure or an organ

iv) Anorexia- an eating disorder usually occurring in adolescent females, characterized by refusal to maintain a normal minimal body weight, fear of gaining weight or becoming obese.

v) Cholagogue- It is a medicinal agent which promotes the discharge of bile from the system, purging it downward.

e) Megaloblastic anemia and Haemolytic anemia (1 Mark for description, 1 Mark for any 2 examples)

Megaloblastic anemia- In this toxicity, bone marrow forms abnormal nucleated erythrocytes, i.e. megaloblast. It is caused due to the impairment of DNA synthesis or some metabolic abnormalities in erythrocyte precursor.

e.g. 5- Flurouracil, cytosine arabinoside, phenytoin, isoniazid



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Haemolytic anemia-This toxicity is a result of an increased rate of destruction of red blood cells. In haemolytic anemia the lifespan of the erythrocytes is shortened.

e.g. Cholroquine, Pamaquine, Pramaquine, Quinine, Aspirin ,Phenacetin, Probenecid, Aminopyrine, Chloramphenicol, Sulfonamide, PAS, Nitrofurantoin, Furazolidone, Dapsone, Dimercaprol, Trinitrotoluene.

Q.2 Attempt any three (4 Mark each)

a)Procedure for dispensing of Non-charge floor stock drugs :(1 Method carries 2 marks)

Two methods are used for the dispensing of Non-charge or free floor stock drugs :

1. Drug Basket Method: The night nurses checks the medicine closet, utility room, & drugs supplies against a master list provided by the pharmacy. The nurses places a check mark on the number required for each drug on the requisition for floor stock supplies. She also places the empty containers in the drug basket.

After completing the procedure ,the empty containers and requisition for floor stock supplies is then sent to the pharmacy. The pharmacy staff fills each container and dispense the requested ampoules and vials as ordered. Once the basket is completed , it is delivered to the floor.

2. Mobile Dispensing Unit: It is a specially constructed stainless steel body of the dimensions:

Height - 60 inches

Width - 48 inches

Depth - 25 inches

The body is fitted on six 8-inch balloon tiers, four of which are swivel type. The pharmacist controlling the mobile unit checks the items and quantity of supplies left in the pavilion drug cabinets. The carbon copy of the requisition for floor stock supplies is left on the on the pavilion as a record of the delivery and the original is returned to the pharmacy for the following purpose:

- i. To determine the rate of consumption of drugs.
- ii. To restock the mobile unit.
- iii. To serve as a charge document for the internal application of costs.

b)

There are three different patterns of the administrative structure of the central service department s.

1. Department as part of nursing service : The majority of items dispensed are used by the nurses for patient care .She should therefore head this department. In INDIA , this pattern is widely accepted in the hospitals.

2. Department under a pharmacist : On account of his training, the pharmacist is competent to handle the functions of this department, viz. procurement, storage and distribution of supplies ,and also the preparation



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of various sterile solutions. The pharmacist already performs these functions in the hospital pharmacy. He, therefore, will find it easy to head this department as well.

3.Department under dual control of pharmacist as well as nurses : Some functions of this department, like cleaning, packaging and distributing medical supplies and equipments is better placed in the charge of a nurse , whereas, the manufacture of sterile solutions is better placed in the charge of a pharmacist.

(c) Patient counseling(1 Mark),

Patient counseling-. It is a part of clinical pharmacy practice to give maximum benefit to the patient. It include the instruction or advise given by the pharmacist to patient for use of the drugs prescribed.

Factor responsible for non compliance(any 6 factors for 3 marks)

- 1.Poor understanding of instructions.
- 2.Unpleasant taste of medication.
- 3.Fear of becoming drug dependant.
- 4.Side effects of the drug.
- 5.Multiple drug therapy.
- 6.Asymptomatic nature of the patient.
- 7.Delay of physician or pharmacist resulting in bored waiting for the drug.
- 8.Measurement of medication.
- 9.Cost of medication
- 10.Frequency of administration.
- 11.Duration of therapy
- 12.illness

(d) Classify pharmacokinetic drug interaction with example

Pharmacokinetics interaction:

(1) GIT Absorption(Any 2 interaction affecting absorption ½ mark each)

Drug interaction may reduce the total amount of drug absorbed. This reduces the therapeutic activity of the drug. Sometimes there is delayed absorption process and onset of action is prolonged. One oral drug may interfere with absorption of other drug in the G.I.T. by altering number of variables.

- 1.pH :Non ionisable Drug (the more lipid soluble) and Acidic drug (low PH) is readily absorbed. If antacid is administered with acidic drug ,it will raise the PH of GI content and inhibits the absorption.
- The enteric coated Bisacodyl (oral dosage form of laxative) should not be given with antacid or milk because increase in PH and cause disintegration of drug in stomach. Causing vomitting and irritation.
-



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2.Complexation

Avoid tetracycline, fluoroquinolones (ciprofloxacin, and norfloxacin) with metal ions like Ca, Mg, Al, iron.to avoid complexation which are poorly absorbed.

3.Adsorption:- Antidiarrhoeal mixtures contain the adsorbent like kaolin which adsorb the other medications,if administer decreases the absorption of these drugs.

4.Change in GI motility:-

Drugs like cathartics increases GI motility decrease absorption of drugs.

Anticholinergic drug decreases GI motility resulting in increased absorption of drugs

Barbiturates reduces absorption of other drugs – e.g.

1.The absorption of warfarin is inhibited by Hepatobarbitone.

2.Griseofulvin by Phenobarbitone .

5.Food :- The presence of Food in stomach reduces the absorption of Drugs by binding with it, or by changing the PH of GI contents it reduces The dissolution rate of drug.

Absorption of antibiotics in presence of food. Hence penicillin and Tetracycline Derivatives should be given 1 hr before meal or 2 hrs after meal.

Some drug like Diazepam achieve higher serum level following food. Cimetidine needs slower absorption ,hence it is advantageous to take it with meal

6.Inhibition of GI Enzyme- :

Folic acid – phenytoin Interaction

Phenytoin inhibits the enzyme intestinal conjugate which is responsible for conversion of poorly absorbed form of folic acid i.e polyglutamate into readily absorbed form of folic acid .i.e monoglutamate.This results into deficiency of Folic acid (Anemia)



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(2) Distribution alteration(Any 2 interaction affecting distribution, ½ mark each)

Displacement from Receptor binding Sites:

Bound Drug	Displacing drug	Result
1. Tolbutamide	Salicylates Phenylbutazone	Hypoglycemia
2. Warfarin	Salicylates Clofibrate	Haemorrhage
3. Thiopentone	Sulphonamides	Prolong anaesthesia
4. Methotrexate	Sulphonamides	Agranulocytosis

(3) Metabolism alteration(Any 2 interaction affecting metabolism, ½ mark each)

a) Stimulation of metabolism

Drug	Inducing agent	Result
1. Tolbutamide	Alcohol, phenytoin Rifampicin	Decreased hypoglycemia
2. Warfarin	Barbiturates Glutethimide	Decreased anticoagulant effect
3. Oral contraceptive	Rifampicin	
4. Quinidine	Phenytoin, Barbiturates	Pregnancy Reduced Quinidine level.



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b) Inhibition of Enzymes:

Drug	Inhibiting agent	Result
1. Phenytoin	Isoniazide, Phenylbutazone Phenobarbitone	Phenytoin intoxication increased anticoagulant effect
2. Warfarin	Allopurinol Nortryptiline	Haemorrhage
3. Tolbutamide	Phenylbutazone	Hypoglycemia
4. Barbiturates	MAO-inhibitors	Prolong sedation

(4) **Excretion alteration** (Any 2 interaction affecting excretion, ½ mark each)

a) **Changes in urinary pH:**

Urinary acidifiers	Drugs whose excretion is enhanced in Acidic urine
Ascorbic acid, PAS, Ammonium chloride, Calcium chloride, Phenylbutazone	Amphetamine, Fenfluramine, Quinidine, Pethidine, Procainamide

Urinary alkalinisers	Drugs whose excretion is enhanced in urine
Ascorbic acid, PAS, Ammonium chloride, Calcium chloride, Phenylbutazone	Amphetamine, Fenfluramine, Quinidine, Pethidine, Procainamide



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b) Interference with urinary excretion:

Primary drug	Competing drug	Result
Indomethacin	Probenecid	Indomethacin toxicity
Salicylate	Probenecid	Salicylate toxicity
PAS	Probenecid	PAS toxicity
Digoxin	Spironolactone	Increased plasma digoxin level
Chlorpropamide	Phenylbutazone	Hypoglycemia
Methotrexate	Salicylates Sulphonamide	Bone- marrow suppression

e). Bio-equivalence(1 Mark), (First-pass effect 3 Mark)

Bio-equivalence: A product is considered bio-equivalent if its rate and extent of systemic absorption does not show a significant difference from the pioneer drug product when administered at therapeutic ingredient, by the same route and under the same experimental conditions.

OR

When the bioavailability of a drug from different formulations is the same , then it is called as Bioequivalence.

First-pass effect:

-Orally administered drugs go to the systemic circulation via hepatic portal system, which first presents the drug to the liver.

-Thus the entire absorbed dose of drug 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 effect.

- It may cause significant reduction in bioavailability. Route of administration highly affects first pass metabolism effect.



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-Bioavailability of propranolol, oxyphenbutazone, chlorpromazine, aspirin undergo first pass effect.

Q.3 Attempt any 3 (4 marks each)

a)(Definition 1 mark , for any 3 reasons 1 mark each)

Adverse drug reactions (ADR) have been defined by the WHO as “ Any response to a drug which is noxious and unintended, and which occurs at doses used in man for prophylaxis, diagnosis or therapy”.

1. Medication errors:

a)self medication of OTC drugs by patient leads to over use or misuse of drug . It may result into excess pharmacological action or complications.

b)Over prescribing of potent medicament to the patient e.g oral hypoglycemic ,antihypertensives etc.

2. Inadequate monitoring of the patient :Drugs like cardiotonics, Diuretics , corticosteroids needs therapeutic monitoring with continuing the administration beyond therapeutic end point which leads into adverse reaction .

3. Sudden withdrawal of drugs: Therapy with drugs like corticosteroids and hormones can not be suddenly stopped . such drug therapy is gradually stopped by decreasing the dose.

4. New potent drugs: the ever increasing number of new potent drugs, along with brands, may cause hypersensitivity reactions in particular individuals.

5. Patient factor :

a)Age:The infants are more prone to adverse effects because of incomplete development of liver enzyme system . Also the elderly patients show higher incidence of adverse effects.

b)Disease state: GIT , Liver , lungs and kidney are major organs taking part in metabolism and excretion of drugs. If any of these organs are diseased , it affects the metabolism and excretion of drugs.Thus, patients with hepatic or renal disfunctioning are prone to adverse effect of drugs.

c)Genetic factors: Some people are sensitive to even low doses of drugs , while others are not . This may be due to defects into either enzyme deficiency , or abnormal enzyme system.

Ex. In people with Glucose -6 -phosphate dehydrogenase (G-6PD) deficiency , antimalarial therapy can develop hemolytic anaemia.

d)Discontinuation of therapy / treatment due to-

1)High cost of medicine .

2)lack of faith on physician,.

3)Non compliance.



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6) Idiosyncrasy of individual: Some drugs affect development of the foetus .this effect depends on the stage of foetal development . Some ex of drugs are

Chloramphenicol can cause abnormalities in new born babies called 'Gray baby syndrome'

Thalidomide causes tetarogenicity.

b)(Any four symptoms 2 marks and For treatment 2 marks)

Chronic LEAD poisoning :

Symptoms : Vomiting ,abdominal pain,metallic taste and blue line on the gums ,chronic constipation Lead encephalopathy is characterised by haematological changes include anemia ,basophilia ,decrease in platelets,hypertension and nephritis.in female,it also causes menstrual disturbances and abortion.

Treatment

- 1.The patient is removed from further exposure of lead poisoning.
- 2.Sodium or potassium iodide is given orally to eliminate lead through kidney .
3. cal .gluconate is given iv if abdominal pain is persist
4. Chelating agent EDTA or dimercaprol parentally.
- 5.In chronic constipation mag sulphate should be used

c)(Any 4 principles 1 mark each)

Guiding principles for Admission or deletion of drugs in the formulary

Following criteria should be taken into consideration for admission or deletion of drugs in Formulary.

1. Whether the medical staff considers the drug to be of proved clinical value based on their experience with it.
2. Drug must be recognized by the Pharmacopoeias and formularies approved under Drugs And Cosmetic Act and Rules there under.
3. The mfg of the drug should have the license under Drug and Cosmetic rules and has not been punished for any serious offence under any law of drug and medicines.
4. No drug or preparation of secret composition will be admitted in the formulary
5. No drug or preparation containing many ingredients shall be admitted if the similar therapeutic effect can be obtain by the use of single ingredient preparation.

d) (For definition 1 mark, 3 marks for any 3 functions, 1 mark each)

Hospital is a complex organization with a single purpose of restoration and maintenance of good health .It provide special facilities and train personal and physician with a single object of patient care.



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• Functions of Hospital:-

1. Patient care : It includes services for diagnosis ,prophylaxis and treatment of diseases to the sick or injured patients. It is a centre 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.
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.



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e) (any 8 equipments ½ marks each)

The equipments required for tablet manufacture recommended under schedule “M” of Drug and Cosmetic Act 1945 are listed in the following table.

Equipment	Examples
1. Mixer/Blender	Sigma blade mixer, tumbling mixers, Ribbon blenders.
2. Grinder /Shifter	Cutter mill, Hammer mill.
3. Dryers	Tray dryers, Fluidised bed dryers.
4. Compression machine	Single punch , double punch , rotary etc
5. Coating machine	Pan coating , spray coating pans, film coating machine and polishing pan. etc
6. Miscellaneous	S.S utensils like scoop , vessels and buckets etc
7. packaging machine	Blister/ strip packaging machine
8. Disintegrator	
9 . Sifter	
10 . Granulator / Granulating machine.	

.Q.4 Attempt any three(4 marks each)

a)(For definition 1 mark)

- Physiological parameters: There are certain physiological constants of the human body which are determined for the evaluation of health status and for diagnosis of disease.

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



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ii) Normal values of DLC(for 2 marks, ½ marks each)

Neutrophils (polymorphs) - 60-70%

Eosinophils -2-4%

Basophils -0-2%

Lymphocyte -20-30%

Monocyte -5-10%

b) (2 marks for description 2 marks for doses)

BAL (British anti-lewiste) (Dimercaprol):-

It is a chelating agent used in the treatment of heavy metal poisoning like Arsenic and Mercury. The heavy metals have the affinity for thiol (-SH) groups and combine with them in body tissue, displacing the hydrogen and depriving the body from these enzymes whose activity depends on thiol group. BAL is administered to react with heavy metal and thus protect the enzyme system of the body. The resultant complex formed is stable and excreted without any damage to liver or kidney.

Dose.3-5 mg/kg I.M at the interval of 4 hrs for 1st 2 days,

interval of 4-6 hrs for additional 2 days

interval of 6-12hrs for additional 7 days.

c) (Introduction 1 mark , 2 marks for any 4 data bases 1/2 marks each, 1 mark for Advantages)

Drug information retrieval

A complete search of the drug information is necessary for the clinical pharmacist so as to satisfy the queries about pharmacology, drug interactions , adverse drug reactions ,toxicology etc . This job of searching can be simplified by using computers.

In 1964, National Library of medicine created a computerized medical information retrieval system MEDLARS .

For information retrieval , the choice of a database is also very important . some online Databases of the medical and pharmaceutical literature are-

1.MEDLARS (Medical Literature Analysis And Retrieval System)

2.MEDLINE(MEDLARS ONLINE)

3.NLM (National Library Of Medicine)



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4. MICROMEDEX: It is a microcomputer based retrieval system that uses a laser disk at the site of storage of data .

5. I.P.A (International Pharmaceutical Abstract) It is available online print version

6. PNI(Pharmaceutical News Index) contains current news about devices , cosmetics and related health industries. It provides news letters which are not covered by printing in abstract and indexes. It is updated weekly.

Advantages

1. Time saving in conducting literature searches.

2. There is an explosion of information on drugs available in the market . Therefore there exists a need for proper selection and evaluation of published drug literature.

d)(1 mark for description of surgical dressings, 3 marks for classification)

The surgical dressings are used to cover the wounds so that it helps in quick healing of wound. These are also used for medication purpose and to absorb and retain a wide range of fluids from the blood and serous exudate of damaged tissue.

A) Plain cloth

There are 3 types

1. Plain cloth with Belladonna extract ex. Belladonna self adhesive plaster,

2. Plain cloth with salicylic acid ex. salicylic acid self adhesive plaster,

3. plain cloth with zinc oxide ex. zinc oxide self adhesive plaster,

B) Elastic cloth :

They are of two types

i) Elastic weft with zinc oxide e.g extention plaster.

ii) Elastic weft with zinc oxide e.g zinc oxide elastic self adhesive factor.

C. Plastic film .

They are three types

i) Perforated plastic self adhesive plaster.

ii) Water proof plastic self adhesive plaster.

iii) Waterproof microporous plastic self adhesive plaster.



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e.) (1 mark for definition, 1 & 1/2 marks for any 2 types)

Outpatient means who are not admitted in the hosp. and offers consultation and diagnosis, receives treatment and does not require bed or hospitalization.

Classification of Out patient

- 1.General Out patient:-He is the patient other than emergency condition, and is not a referred case.
- 2.Referred Out patient:- He is referred directly by his attending medical/dental practitioner for specific treatment .
- 3.Emergency Out patient:-He is the patient suffering from serious health or accidents requires immediate medical attention.
- 4)Ambulatory Out patient:- He is the patient coming for maintaining the daily personal health.

Q.NO.5 Attempt any three of following (4marks each)

a)Define formulary (1mark) & Reason for need of it (6reasons for marks 3)

Define formulary (1mark)

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

OR

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 (6reasons for marks 3)

- 1) It outline the purpose of organization, functions & scope of hospital formulary
- 2) It provide guidance regarding selection, procurement, storage, distribution, use, safety procedure & other matter relating to drugs in hospital
- 3) It provides the staff the basic therapeutic information about each approved drug product.
- 4) It delivers the information on hospital policies & procedure pertaining to use of drug.
- 5) It provides special information about drug dosing, rules & abbreviations used in a hospital.
- 6) It provide information about antidote, emergency situation
- 7) It acts as guide for pharmacist, nursing staff & doctors.

b)Pathophysiology of hepatitis(Pathophysiology of hepatitis A 2 marks, Pathophysiology of hepatitis-B ,2 marks)

Pathophysiology of Hepatitis –A

Inadequate hygiene, overcrowding, close person to person contact, poor sanitation etc are the common factors for spread of disease.



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Viruses enter liver cells & cause degenerative changes. Fibrous tissue develops in the damaged area. Effect depends on the amount of fibrous tissue formed.

Once the virus enters the circulation, accumulation of virus takes place in hepatocyte & hepatic sinusoids.

The viral particle replicate within hepatocytes. Infective viral particle spread into blood, bile & other body secretions, Hepatotropic viruses cause hepatic injury. Damage to liver cells is caused by fibrosis in the liver.

Pathophysiology of Hepatitis –B

It spread due to infected syringes, needles, intravenous sets.

It can be transmitted parentally, vertically or venerally.

Transfer of infection from mother to infant is vertical transmission.

Veneral transmission via unprotected sex, intercourse with multiple partners etc.

Hepatitis –**B** virus is double-shelled spherical DNA virus

Hepatitis –**C** infection is transmitted through transfusion of blood & blood products.

c) Differentiate between psychological & physical drug dependence (6 points for 4 marks)

Sr.No.	Psychological drug dependence	physical drug dependence
1	It is state characterized by emotional or mental desire to continue taking a drug.	It is state which shows itself by intense physical disturbances in case the drug is not administered.
2	No compulsion to take the drug	There is compulsion to take the drug
3	Withdrawal symptoms are not observed or very minor	Withdrawal symptoms or abstinence are observed
4	No need of specific drug to treat withdrawal symptoms	Specific antagonist with supportive therapy is needed
5	It is not necessary to develop tolerance or physical dependence	Withdrawal symptoms are life threatening & severe
6	Eg nicotine, caffeine	Eg opiate, alcohol

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d) What is clinical pharmacy (1 mark) & Objectives of clinical pharmacy (6 points for 3 marks)

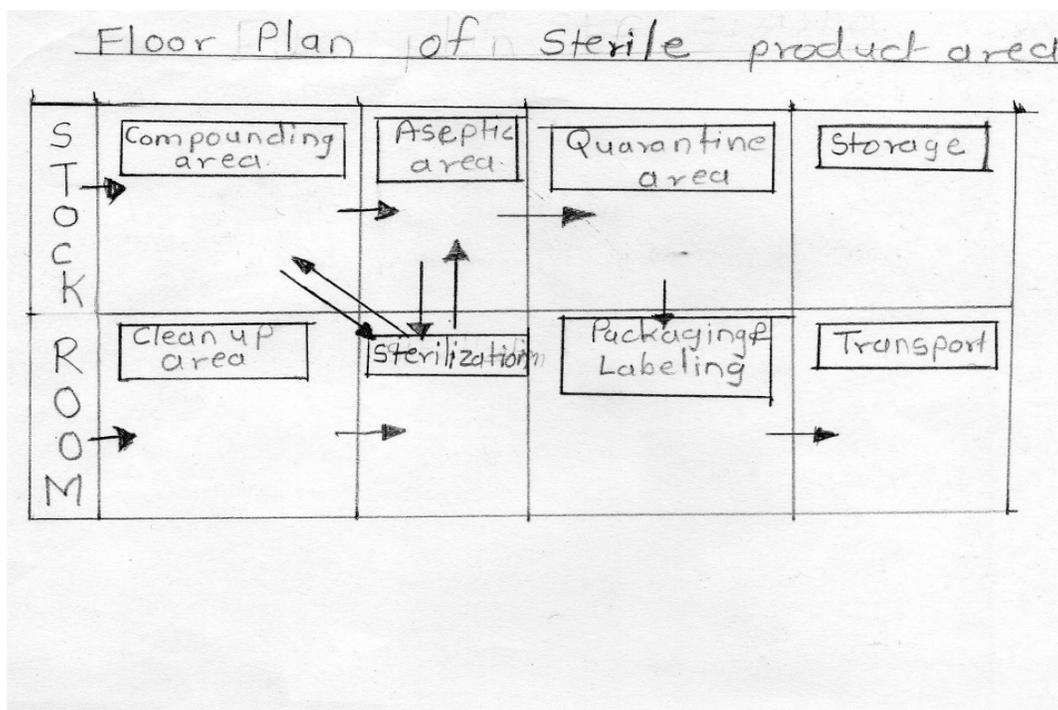
What is clinical pharmacy (1 mark)

It is a branch of pharmaceutical sciences which deals with various aspect of patient care, not only with dispensing of drug but also advising patient on rational selection & safe use of drug.

Objectives of clinical pharmacy (6 points for 3 marks)

- 1) It provides pharmaceutical care related to monitoring of drug therapy, which improves quality of life of patient
- 2) It gives opportunity to assist the physician in doing a better job of prescribing and observing drug therapy
- 3) It involves proper decision and judgement on deciding the drug therapy to avoid adverse effects or to discontinue the therapy
- 4) It offer opportunity to educate the patients by involving them in the process of drug utilization.
- 5) It shows the rational use of drug by using professional knowledge of pharmacy.
- 6) It enhance the effectiveness, safety, potency and accurate drug therapy.
- 7) It has basic aim to give maximum drug efficiency, reduced drug toxicities and provide cost effectiveness of drug.

e) Floor plan of sterile product area



Q.No.6. Attempt any three of following (4 marks each)

a) pka(1 mark) , partition coefficient (1.5 mark) and gastric transit time (1.5 mark) affect bio availability.

pka affect bio availability- Non ionized, lipid soluble drugs are better absorbed while strongly acidic or basic drugs or highly ionized drugs show reduced bioavailability from GIT. The extend of ionization depends upon pka value.



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Partition coefficient affect bio availability- It is the ratio of solubility at equilibrium in an aqueous solvent to its solubility in an non aqueous solvent.

Hydrophilic drug means soluble in water. Lipophilic drugs means that is miscible with oil or lipid.

Non-ionized form of a drug is more lipophilic than ionized form.

Hydrophilic drugs have higher water solubility so its dissolution rate is more rapid than lipophilic drugs. But in aqueous fluid, its non-ionised form is better absorbed, because the biological membrane is lipidal in nature.

Gastric transit time affect bio availability- Presence of food material and motility of intestine affects the absorption of drug e.g. absorption of ampicilline, tetracyclines is reduced in the presence of food. While Acetylcholine increases rate of motility results in decreases absorption & bioavailability.

b) Technical abilities (2 marks) and administrative abilities (2 marks) for hospital pharmacist.

Technical abilities for hospital pharmacist (any 4 points for 2 marks) -

- 1) He must have adequate knowledge and technical background to manufacture different dosage forms. He must be aware about the source of the drugs, costing etc.
- 2) He must have knowledge in basic sciences and pharmaceutical sciences.
- 3) He must be expert in pharmacokinetic and pharmacotherapeutic of drugs.
- 4) He must have knowledge for testing of raw material, finished product. by using various instruments, reagents like HPLC, HPTLC, pH.
- 5) He must know storage of drugs and their stability.
- 6) He must have ability to perform different pharmacological and toxicological experiments on compounds under investigation.

Administrative abilities for hospital pharmacist. (any 4 points for 2 marks) –

- 1) He should plan organize and control various functions of the hospital pharmacy.
- 2) He should interact and communicate to other department.
- 3) He must knowledge of planning and accounting and inventory control.
- 4) He must know about patient counseling.
- 5) He must have knowledge about related laws and legal regulations.

c) Conditions to be fulfilled by all parenterals. (any 8 points,1/2mark each)

- 1) It must be sterile.
- 2) It must be free from pyrogens and viable microorganisms.
- 3) It must be isotonic with blood plasma



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- 4) Its specific gravity must be similar to blood plasma
- 5) It should have a pH similar to blood plasma.
- 6) It must be non toxic, non irritant to the body.
- 7) It must be free from physical and chemical contaminants.
- 8) It must be free from dust and dirt particles
- 9) It must be chemically inert

d) 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.

e) Food Drug Interaction (explanation 1 marks and example 3 marks) –

In case of oral administration of drug, food may alter the absorption of drug by –

- i) Dilution of drug
- ii) Adsorption or complexation of drug
- iii) Change in gastric emptying



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Examples- (any 3 for 3 marks)

i) Milk reduces absorption of tetracycline by forming an insoluble complex.

ii) Fatty food delays gastric emptying time and alters rate of absorption.e.g- Griseofulvin

iii Mono amine oxidase(MAO) is an enzyme which breaks down catecholamines such as Nor-epinephrine.When the enzyme is inhibited, there are increased level of Nor-epinephrine. Thus MAO- inhibitors are used as antihypertensives. if MAO inhibitors administered with tyramine containing food like chees and butter,alcoholic beverages ,Tyramine is metabolized by MAO. When patient being treated with MAO- inhibitors also take tyramine containing food, Tyramine reaches systemic circulation causing severe hypertention.

iv) Absorption of some drugs reduces in presence of food e.g. ampicillin, Rifampicin, Aspirin , Isoniazide, Tetracycline, Benzylpenicillin, Levodopa.

Iron absorption is reduced if food has been taken within the previous two hours. If Iron is taken on empty stomach it can cause nausea. Therefore Iron tablets are often given with food.

v) Absorption of drugs like- riboflavin, spironolactone, Lithium,citrate,Carbamazepine increases in presence of food. Nitrofurantoin is given with food to avoid GIT irritation this also increases drug absorption.