



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 anyequivalent 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.



Q. No.	Sub Q. N.	Answer	Marking Scheme
1		Answer any <u>EIGHT</u> of the following: (2marks each)	16M
1	a)	Define : (1M each) i) Hospital Pharmacy ii) Teratogenicity i)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. ii) Teratogenicity- The administration of certain drugs to pregnant woman, specifically during the first trimester of pregnancy results in foetal abnormalities is called as Teratogenicity	2M
1	b)	Give the normal physiological value of: (any four) (½ M each) i) Haemoglobin- Male-15.5 +/- 2.5gm% Female- 14+/- 2.5gm% ii) Blood Cholesterol-150-240 mg% iii) Clotting time of blood: 4-10 minutes OR Slide and Capillary tube method.-3-6 minutes. iv) Sperm count- 60 to 150 millions/ cc of semen v)Heart rate- 70- 80/ min	2M
1	c)	Translate into English: (any four) (½ M each) i) Guttae- A Drop ii) Unus- One iii) Charata- A powder iv) Bis in Die- Twice a day v) Omni nocte- Every night.	2M
1	d)	What is the full form of following: (any four) (½ mark each) i) WFI- Water For Injection ii) DIC- Drug information Centre iii) PTC- Pharmacy and Therapeutic Committee	2M



		<p>iv) CUDD- Centralized unit dose dispensing</p> <p>v) EEG- Electro Encephalogram</p>	
1	e)	<p>What advice will you give to patients about following drugs-(Any two) (1 mark each)</p> <p>i)Spermicidal jellies & cream-“ Should be applied 10 to 30 minutes before sexual intercourse & remains in vagina 6 to 8 hours afterwards”</p> <p>ii)MAO- Inhibitors- “ Avoid Cheese, alcoholic beverages and liver and yeast extract”</p> <p>iii) Salicylates-“ Do not take on empty stomach”</p>	2M
1	f)	<p>Name two preservatives used in parenteral preparation. (any 2 -1 mark each)</p> <p>i. Chlorocresol</p> <p>ii. benzalkonium chloride</p> <p>iii. benzyl alcohol</p> <p>iv. phenyl mercuric nitrate</p>	2M
1	g)	<p>Define the term- Referred patient, Ambulatory patient. (1 mark each)</p> <p>i) Referred patient- He is referred directly to outpatient department by his attending medical/ dental practitioner for specific treatment, other than an emergency treatment, and who later returns to the practitioner for further treatment.</p> <p>ii) Ambulatory patient- An ambulatory patient is ‘able to walk’ and receive primarily health care and walk off from the hospital.</p>	2M
1	h)	<p>Give any two reasons for patient noncompliance. (any 2 reasons – 1 mark each)</p> <p>1.In appropriate packaging : Some time design or size of container make difficulty to remove the medicament .Many elderly patient ,arthritis patient have difficulty with unit dose pack or foil wrapping while removing medicament</p> <p>2. Poor labelling: Poorly hand written label are difficult to read or follow for the patient/pharmacist. Many prescriptions contain direction which are inadequate like take when required or use as directed that may produce confusion.</p> <p>3. Multiple drug therapy: Greater the number of drugs patients is taking the higher is the risk of non compliance.</p> <p>4. Asymptomatic nature of patient: In case of asymptomatic patient, it is difficult to convenience a patient by explaining the value of drug therapy results in non compliance.</p> <p>5. Measurement of medication: Many times there is confusion to the patient in measuring liquid preparations or number of tablets.</p>	2M



		<p>6. Cost of medication: Because of high cost of drugs, poor patients are not purchase such drug.</p> <p>7. Frequency of medication: Regular schedule of dosage intake cannot be followed due to work load.</p> <p>8. Duration of therapy: Long duration treatment lead to patient noncompliance.</p> <p>9. Illness: The nature of patient's illness may contribute to non-compliance like chronic hypertension, mental illness.</p>	
1	i)	<p>Give the uses of: (Any two) (1 M each)</p> <p>i) Ryle's tube</p> <p>i) To give fluid or drugs to those patients who can't imbibe enough amount.</p> <p>ii) To give stomach wash in case of poisoning.</p> <p>iii) For gastric juice analysis.</p> <p>ii)CT scan-</p> <p>CT stands for computed tomography. It is an advanced technique used for morphological examination of neurological organs, head, eyes, neck, spinal cord etc.</p> <p>iii)X-ray machine-</p> <p>It is used to take internal photographs of body. For e.g. to check a fracture of bone or to check the status of TB in lungs.</p>	2M
1	j)	<p>What are the benefits of unit dose dispensing? (any 4 benefits – ½ mark each)</p> <p>1. The patients are charged for those which are administered to them.</p> <p>2. It reduces the medication error since the pharmacist checks the copy of physician's original order.</p> <p>3. It avoids drug losses, no pilferage of drug.</p> <p>4. Less space is required as compared to bulky floor stock.</p> <p>5. Patients receive the nursing service 24 hrs a day.</p> <p>6. It avoids duplication of orders and extra paper work.</p>	2M



		7. It enhances more efficient utilization of personnel 8. It eliminates labelling error. 9. Drug accounting become easier. 10. Better financial control means credits are eliminated.	
1	k)	Classify Hospital on the basis of its bed size. i) Large Hospitals- Bed capacity 1000 and above e.g.- J.J.Hospital Mumbai ii) Medium Hospitals- Bed capacity 500-1000 e.g.- Bombay hospital iii) Small hospitals- Bed capacity 100-500 e.g.- Breach candy hospital Mumbai iv) Very small hospital- Bed capacity below 100 e.g.- Any private hospital	2M
1	l)	Name four quality control tests for parenterals. (½ M each) 1. Sterility Test 2. Pyrogen Test 3. Clarity Test. 4. Leaker Test 5. Assay	2M
2		Solve any FOUR : (3 marks each)	12M
2	a)	Name various methods of sterilization. Give principle of Hot air oven and autoclave. Methods of sterilization- (1 M) I) Physical method- i) Moist heat sterilization ii) Dry heat sterilization iii) Radiation II) Chemical method- i) Gaseous sterilization ii) Heating with bactericide III) Mechanical method i) Sterilization by filtration	3 M



	<p>Principle of Hot air oven- (1 M)</p> <p>All microorganisms including bacterial spores can be destroyed .Dry heat kills the microorganisms by oxidation of cell proteins.</p> <p>Principle of Autoclave- (1 M)</p> <p>Autoclave is used to carry out steam sterilization. It works on the principle of utilization of saturated steam under pressure. The steam has more penetrating power and thermal capacity than dry heat. Saturated steam under pressure causes coagulation of cell protein leading to the destruction of microorganisms. The steam penetrates in the spores and capsules of bacteria, ruptures it and the escaping protoplasm is coagulated.</p>	
2	<p>b) Write in brief about bed side pharmacy.</p> <p>Bed-side pharmacy-</p> <p>Hospital pharmacy is becoming increasingly patient oriented nowadays. Hence he/she must work in close association with the nursing and medical staff. Personally each pharmacist in the hospital should visit the wards, go to each patient's bedside and discuss with them regarding the medicines and drugs they take. This is called as Bed-Side pharmacy.</p> <p>Following points are considered to become bedside pharmacy,</p> <ol style="list-style-type: none">1. The pharmacist should build an inter-professional team of the physicians, nurses and pharmacists.2. Ward visit:-Daily in the morning, he visits the wards and enquires about the progress of health etc.3 Take medication history of each patient during the visits.4. He interacts with the physicians about medicine and with nurses regarding storage, handling and safe use of the medicine.5. Pharmacist carrying out such visits must have thorough knowledge about drug food reactions, allergies, side effects and adverse reactions of drugs.6. He/she should give counselling to the patients regarding their food habits and ways of administration of drug.7. He/she guides the patient about the treatment to be continued after discharge and how the drugs should be stored at home to avoid its degradation.	3M



		8. Medication at Bed-Side: Lifesaving drug--Nitroglycerine tablet is kept at bedside, if ordered by physician. 9. Not more than one strip/10 tablet shall be left with the patient.	
2	c)	<p>What is prepackaging of medicines? Give its advantages. (2 M for explanation, any 2 advantages- 1 M)</p> <p>Pre-packaging increases the standard of practice of hospital. The following factors should be considered while pre-packaging-</p> <ul style="list-style-type: none">• Demand and turnover of the items• Availability of containers.• The labelling to be done.• The process of packaging.• The stability of items.• Cost of prepackaging. <p>It is useful for IPD & OPD. The size of pre-packaging is decided by consultation with the pharmacy, medical and nursing staff. The data for pre-packaging of various dosage forms and therapeutic agents is obtained from Hospital formulary. In OPD the size of pre-packaging is decided by call cycle of patient. But there is major drawback of pre-packaging that the patient is taken off the drug that has been pre-packaged the remaining quantity will sheer waste. Pre-packaging operation is carried out either by pharmacist or under his direct supervision.</p> <p>Advantages-</p> <ul style="list-style-type: none">• It is suitable for fastest moving items whose demand is very high and also for those items which takes long time for compounding and packaging.• It offers convenience.• It is labour saving.• It is time saving.	3M



2	d)	<p>Enlist the abilities required for hospital pharmacist. Explain any two. (To enlist 1 M, 2 Mark for any 2 abilities)</p> <p>The hospital pharmacist should possess following abilities:</p> <ol style="list-style-type: none">1. Administrative ability2. Technical ability3. Manufacturing ability4. Research ability5. Teaching/Training ability6. Ability to Control <p>1. Administrative ability-Hospital pharmacist should be thoroughly familiar with organisation 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.</p> <p>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 pathophysiology, therapeutics and patient care techniques.</p> <p>3. Manufacturing ability-Hospital pharmacist must be able to develop formulations not available commercially. Hospital pharmacist should possess an adequate understanding of the principle involved in formulations and preparation of dosage forms.</p> <p>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.</p> <p>5. Teaching/Training ability- Hospital pharmacist is responsible for training of new personnel and for carrying out continuous educational programme for pharmacist and</p>	3M
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		<p>pharmacy supportive personnel. Hospital pharmacist must be able to develop well planned and co-ordinate training programme and able to deliver lectures.</p> <p>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.</p>	
2	e)	<p>Give the functions of PTC. (any 6 functions – ½ mark each)</p> <ol style="list-style-type: none">1) To advise the medical staff and hospital administration in matters related to the use of drugs2) 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.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	3M
2.	f)	<p>Discuss drug food interaction. (any 6 examples- ½ mark each)</p> <p>Food affects the absorption of the drug. It may be attributed to</p> <ol style="list-style-type: none">1) Dilution of the drug2) Adsorption or complexation of drug3) The alteration of gastric emptying. <p>Examples:</p> <ol style="list-style-type: none">1) Food reduces the absorption of aspirin, isoniazide, tetracycline, benzyl penicillin, amoxicillin, Ampicillin, levodopa and Rifampicin2) Food increases the absorption of hydralazine, nitrofurantoin, lithium citrate, riboflavin, carbamazepine, metoprolol, propranolol, and spironolactone.	3M



	<p>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.</p> <p>4) Nitrofurantoin is given with food to avoid GIT irritation.</p> <p>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.</p> <p>6) The diuretic effect of tea takes place rapidly if given before meals but diuresis is delayed if it is given after food.</p> <p>7) The absorption of nitrazepam, glibenclamide, metronidazole, oxazepam, theopylline is unchanged by food.</p> <p>8) Monoamine oxidase (MAO) is an enzyme which breaks down catecholamines such as or epinephrine. When the enzyme is inhibited, there are increased levels of nor epinephrine 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 patients being treated by MAO inhibitors also take tyramine containing food, tyramine reaches the systemic circulation causing severe hypertension.</p> <p>9) Milk reduces absorption of tetracycline by forming an insoluble complex</p>	
3	Solve Any <u>FOUR</u>: (3 marks each)	12M
3	<p>a) Which are the equipments for manufacture of pills and compressed tablets as per Drugs and cosmetics Act & Rules? (3 marks)</p> <p>Requirements for Tablets and Pills</p> <p>For effective operations, the tablet production department shall be divided into four distinct and separate sections as follows: -</p> <p>(a) <u>Mixing, Granulation and Drying section</u></p> <p>(1) Disintegrator and sifter</p> <p>(2) Powder mixer</p> <p>(3) Mass mixer/Planetary mixer/Rapid mixer granulator.</p> <p>(4) Granulator</p> <p>(5) Thermostatically controlled hot air oven with trays (preferably mounted on a trolley)/Fluid bed dryer.</p> <p>(6) Weighing machines.</p> <p>(b) <u>Tablet compression section.</u></p>	3M



		<p>(1) Tablet compression machine, single/multi punch/rotatory.</p> <p>(2) Punch and dies storage cabinets.</p> <p>(3) Tablet de-duster</p> <p>(4) Tablet Inspection unit/belt.</p> <p>(5) Dissolution test apparatus</p> <p>(6) In-process testing equipment like single pan electronic balance, hardness tester, friability and disintegration test apparatus.</p> <p>(7) Air-conditioning and dehumidification arrangement (wherever necessary)</p> <p>(c) <u>Packaging section (strip/blister machine wherever required).</u></p> <p>(1) Strip/blister packaging machine.</p> <p>(2) Leak test apparatus (vacuum system)</p> <p>(3) Tablet counters (wherever applicable)</p> <p>(4) Air-conditioning and dehumidification arrangement (where ever applicable).</p> <p>(d) <u>Coating section (wherever required).</u></p> <p>(1) Jacketed kettle (steam, gas or electrically heated for preparing coating suspension).</p> <p>(2) Coating pan (stainless steel)</p> <p>(3) Polishing pan (where applicable)</p> <p>(4) Exhaust system (including vacuum dust collector)</p> <p>(5) Air-conditioning and dehumidification arrangement.</p> <p>(6) Weighing balance.</p>	
3	b)	<p>Name any four surgical instruments with their uses. (any 3 instruments – 1 mark each)</p> <p>Surgical instruments are used for different activities like incision, cutting, holding etc.</p> <p>1.Scalpels: The scalpel is used to make incision.</p> <p>2.Scissors: It is an instrument which helps in cutting and dissecting.</p> <p>3. Tissue forceps: Tissue forceps are used to hold tissues for traction or opposition having good grip on the tissue.</p> <p>4. Haemostatic forceps : (any 1)</p> <p>1.To achieve haemostasis.</p> <p>2. to catch bleeding of periosteal vessel</p>	3 M



	<p>3. To hold bleeding in fibrous background.</p> <p>4. In appendectomy to pass ligature around the appendicular artery</p> <p>5. Swab holding forceps: (any 1)</p> <ol style="list-style-type: none">1. To hold fundus of gall bladder during cholecystectomy.2. As a tongue holding forcep3. For swabbing a cavity4. To hold ovum. <p>6. Needle holder : It is used for holding the needle.</p> <p>7. Sharp curate: It is used for dilation of cervical and uterine curate.</p> <p>8. Cusco's speculum: It is a female gonadal instrument mainly used to retract the vaginal walls for examination of internal structures.</p> <p>9. Kocher's intestinal clamp : it is used to hold the intestine</p>	
3	<p>c) What are the functions of Modern Hospital? (any 3 functions – 1mark each)</p> <p>Functions of Modern Hospital:-</p> <ol style="list-style-type: none">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 , pharmacists , nursing staff, medical technologist and allied health professional helps to fulfil their curriculum requirement. Hospital also educates the general public through lectures and demonstrations on the preventive aspects of common and serious diseases. Hospital provides the methods by which the persons can work together in groups with the object of care of	3M



		patient and community. 5. Counselling and patient advice: It is a modern concept adopted in big hospitals for the wellbeing of the patients. During these counselling sessions pharmacists educate people on communicable diseases, epidemics and family welfare etc.	
3	d)	Describe signs, symptoms and pathophysiology of Rheumatoid Arthritis or Diabetes <u>Pathophysiology: (1 ½ marks)</u> 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. <u>Signs and symptoms (1½ marks):</u> <ol style="list-style-type: none">1. Fatigue, anorexia, weight loss and fever2. 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 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. <u>OR</u> <u>Diabetes:</u> Pathophysiology (1 ½ Marks) Diabetes is a chronic disorder of carbohydrate, fat and protein metabolism, in which the body either fails to produce sufficient amount of insulin or responds abnormally to insulin. In a diabetic person, due to abnormal insulin metabolism, the body cells and tissues do not	3M



make use of glucose from the blood, resulting in an elevated level of blood glucose, hyperglycemia. Over a period of time, hyperglycaemia can lead to severe complications, such as eye disorders, cardiovascular diseases, kidney damage and nerve problems.

Type I diabetes mellitus results from immune mediated destruction of pancreatic β -cells. Hyperglycemia occurs when 80-90% of β -cells are destroyed. It results in secretion of no insulin from pancreas. It is insulin dependent diabetes.

In Type II diabetes mellitus, there is a normal production of insulin hormone, but the body cells are resistant to insulin. Since the body cells and tissues are non-responsive to insulin, glucose remains in the blood stream. Insulin resistance is manifested by increased lipolysis and free fatty acid production. The liver metabolises free fatty acid into ketone bodies that results in ketoacidosis.

Sign and symptoms:(1 ½ Marks)

1. Polyuria (frequent urination), polydipsia (increased thirst) and polyphagia
2. Hyperglycaemia, poor wound healing and maximum. Susceptibility to infection and weight loss. Nocturia, blurred vision, vascular complications, numbness in feet, itching and drowsiness occur
3. In case of chronic patients, it leads to Kidney failure, lesions in the eye and high frequency of gangrene.



3	e)	<p>Explain what happens when the following drugs are prescribed together: (1 ½ Marks each)</p> <p>i) Digitalis with Diuretic</p> <p>ii) Warfarin and Phenylbutazone</p> <p>i)Digitalis with Diuretic- Diuretic causes loss of potassium from body results in hypokalemia and if digitalis is administered it may produce digitalis toxicity.</p> <p>ii)Warfarin and Phenylbutazone: Phenylbutazone displaces the warfarin from its binding sites resulting in increased amount of free form of warfarin causing haemorrhage.</p>	3M
3	f)	<p>Define Hospital formulary? Write the guiding principles while using Hospital Formulary.(1 Mark for Definition, 2 marks for guiding principles- any 4 points)</p> <p><u>Hospital formulary-</u> Hospital formulary is revised compilation of pharmaceutical preparations and ancillary drugs which reflects current clinical judgment of medical staff of the hospital.</p> <p><u>Guiding principles for preparation of Hospital Formulary: (any 4 points)</u></p> <p>The following principles will serve as guide to all those utilizing the formulary system:</p> <ol style="list-style-type: none">1. The medical staff of the hospital shall appoint P and T Committee and outline its scope, purpose, organization and function.2. The formulary system will be sponsored by medical staff based upon recommendations of P and T Committee.3. The medical staff shall adopt the written policies and procedures of the formulary system.4. Drugs should be included in the formulary by their nonproprietary names and should be prescribed by the same name.5. Limiting the number of drugs available from pharmacy can produce substantial patient care and financial benefits. These benefits can be greatly increased by using generic equivalents. <p>Generic equivalent- The drugs containing identical active compounds. E.g Two brands of tetracycline.</p>	3M



		<p>Therapeutic equivalent- The drugs differing in composition but having very similar pharmacological or therapeutic effects. E.g: two different antacid products.</p> <p>6. The management of the hospital shall inform all the medical and nursing staff about the existence of the formulary system, procedures of the operation of the system and any changes in those preparations. Copies of formulary must be readily available at all times.</p> <p>7. Provision shall be made for the use of drugs not included in the formulary, by the medical staff.</p> <p>8. The pharmacist shall be responsible for specification as to quality, quantity, and source of supply of all the drugs used in the diagnosis and treatment of patients.</p>	
4		Solve Any <u>FOUR</u>: (3 marks each)	12M
4	a)	<p>What is Idiosyncrasy and Allergy? (1 ½ Marks each)</p> <p><u>Idiosyncrasy</u>- The term idiosyncrasy (Greek idios means ‘one’s own and synkrisis, a mixture together’) is used to denote abnormal drug response. Idiosyncrasy covers unusual, bizzare or unexpected drug effects which cannot be explained or predicted in individual recipients. It also includes drug induced foetal abnormalities,</p> <p>e.g. (any 1 example)</p> <ol style="list-style-type: none">1. phocomelia which developed in the offspring’s of mothers exposed to thalidomide.2. Individuals with deficiency of Glucose 6 phosphate dehydrogenase enzyme are at more risk of developing haemolysis after use of antimalarials, antibiotics, sulphonamides, salicylates3. Analgesics may induce tumours of kidney and pelvis in patients with renal disease.4. Long term therapy with immune suppressive agents like azathioprine, cyclophosphamide may induce lymphoid tumours <p><u>Allergy</u>: These reaction are common but unpredictable which ranges from mild skin reaction to major anaphylaxis and death occurring very rarely. The term “allergy” is used to indicate an immunological reaction.</p> <p>Drug or its metabolites (simple structure) combine with body proteins. These stable drug protein complex acts as antigen .Simple chemicals which are capable of binding firmly with a</p>	3M



protein to form antigenic product, are term as 'haptens'.

When an individual comes in contact with such antigenic complex .there occurs formation of antibodies; i.e sensitized. Such sensitized individual when re exposed to the drug or haptens, antigens reacts with antibodies. Antigen –antibody complex triggers the release of mediators like histamine from mast cells and cause allergic drug reaction. Now manifestations of allergic reaction occurs which are characteristic of the mediator and not the drug.

(any one example)

Allergic reaction	Causative drugs
Anaphylaxis	Penicillin, Dextran, Iodine containing compound.
Skin rashes	Sulphonamide, penicillin, Barbiturates
Hemolytic anemia	Sulphonamide, penicillin, Quinidine and methyl dopa.
Hepatitis	Phenothiazines, methyl dopa
Leucopenia	Sulphonamide, thiouracil, henybutazone
Nephritis	Methicilin, oxacillin, nafcillin

4 b) Define clinical pharmacy. What is the scope of clinical pharmacy? (1mark for definition and 2 marks for any 4 points) 3M

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.

Scope of clinical pharmacy— (any 4 points)

1. Medication history- it includes past and present of prescription and non – prescription drug, dietary supplements, dietary habits, drug and estimate of patient compliance with the drug therapy.

2. Monitoring drug therapy- it includes evaluation of patient pharmacokinetics and pharmacodynamics parameters, lab. Findings, medical problems and communicating relevant



	<p>findings to physician.</p> <p>3. Participation in ward rounds- The clinical pharmacist with physicians should participate in ward rounds, observe individual patient and decide the drug therapy.</p> <p>4. Drug information- The clinical pharmacist establish drug information center. The drug info. Is available at this centre and utilized suitably. This data is send to physician as per their requirements.</p> <p>5. Patient counselling- 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.</p> <p>6. Participation in new drug investigation- clinical pharmacist along with physician participates in investigation of new drugs. Data of this investigation is compiled, analyzed and maintained at drug information centre.</p> <p>7. ADR management- Along with physician clinical pharmacist's activity is involved in reporting of management of ADR.</p> <p>8. Educational Programme- clinical pharmacist organized educational programs for nursing and education related to safe and effective use of drugs.</p> <p>9. Tailoring drug therapy- the clinical pharmacist after the diagnosis of physician formulates drug therapy as per clinical need of individual patient.</p>	
4	<p>c) Enlist the different softwares used in Hospital pharmacy. Explain the use of computer in Inventory control. (1 mark to enlist any 2 software , 2 marks for 2 systems of inventory control)</p> <p>Softwares (any 2)-</p> <p>Micromedex, PubMed, MEDLINE, MEDLARS, BIOSIS, MEDIPHOR, PAD.</p> <p>The computer can be effectively used for inventory control in the hospital pharmacy as follows:</p> <p>i) Periodic inventory control system- In this system, inventory of goods is manually checked, the amount of stock in hand, minimum and maximum, can be found out by feeding the data to the computer. Once the stock is entered in the computer, it is helpful for placement of order to each supplier.</p> <p>ii) Perpetual inventory control- In this system, computer maintains running balance of all drugs in the stock. All drugs are entered into the database. When they arrive in the pharmacy,</p>	3M



	<p>they are added in the initial stock, so as to update the current stock. The current level of each drug is found out by subtraction from the inventory balance.</p> <p>Thus, the computer can list out minimum order quantity of each drug. In this way computer can help in inventory control-</p> <ul style="list-style-type: none">- To detect the items those have reached minimum order level.- To prepare the list of drugs to be ordered and their quantities.- To prepare the purchase order and avoid duplicate orders.- Keeping the inventory records for accounting aspects, audit inspections and legal requirements.- For automatic updating of price- For evaluation of demand.- To detect infrequently purchased items for possible return of elimination from pharmacy's drug supply.	
4	<p>d) How surgical cotton is evaluated as per I.P? (any 3 test as per IP – 1 mark each)</p> <p>Evaluation of Absorbent Cotton Wool I.P.</p> <p>1. Identification test:</p> <p>(a) When treated with iodinated Zinc Chloride solution, the fibres become violet.</p> <p>(b) Microscopic examination shows the length of each fibre to be up to 4 cm and the width up to 40 μm, the shape being flattened tube with thick rounded matter, and twisted. Only occasionally one foreign fibre is observed.</p> <p>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 colour develops in either portion.</p> <p>3.Surface active substances:</p> <p>Shake 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.</p> <p>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.</p> <p>5. Water holding capacity: After evaluating the sinking time remove the basket from the water and drain it for 30 seconds in horizontal position. Weigh it and calculate the weight of water retained by the sample .It should not be less than 23 g of water / gm of sample .</p> <p>6. Neps: Spread thin layer 5 g of Absorbent cotton for an area of 450 sq cm .uniformly</p>	3M



		<p>between two glass plate and view by naked eye under transmitted light. Should not be more than 500 nepts/gm of absorbent cotton.</p> <p>7. Water soluble substances: Not more than 0.5 %</p> <p>8. Ether soluble substances: Not more than 0.5 %</p> <p>9. Sulphated ash: Not more than 0.5 %</p> <p>10. Loss on drying : To check % w/w of volatile & moisture substances. Not more than 8.0 % w/w</p> <p>11. Fluorescence Test- A 5mm thickness layer examine under 365 nm u.v. lamp. It shows only a slight brownish violet fluorescence & few yellow particles. Not more than few fibres show an intense blue fluorescence.</p>	
4	e)	<p>Define Hallucinogen. Give the effects and treatment of LSD. (1 mark each for definition , effects and treatment)</p> <p>Hallucinogens are agents that act on CNS to produce a state of perception of matters/objects with no reality or feeling with no external cause.</p> <p style="text-align: center;"><u>OR</u></p> <p>Hallucinogens are a group of naturally occurring and synthetic compounds capable of producing distortion of reality resulting in confusion, delirium, amnesia and loss of sense of direction, space and time.</p> <p>Effects of LSD: A person on LSD may experience physiological effects, including raised blood pressure and heart rate, dizziness, loss of appetite, dry mouth, sweating and tremors; but the drug's major effects are emotional and sensory. The user's emotions may shift rapidly from fear to euphoria, with transitions so rapid that the user may feel several things simultaneously, including panic and extreme terror. Panic and terror can lead a user to run across a busy street. LSD also has dramatic effects on the senses. Colors, smells, sounds and other sensations appear highly intensified.</p> <p>Treatment: - It includes supportive environment and the extreme agitation is controlled by Antianxiety and tranquilizer diazepam.</p>	3M
4	f)	<p>Define DIB. Write sources of drug information. (1 mark – Definition , 2 marks – sources)</p> <p>Drug information Bulletin: The drug Information Centre may publish a journal or periodical</p>	3M



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”

1.Primary sources –

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

2.Secondary sources –

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- Remington’s pharmaceutical science, Merck index

iv) Pharmacopoeias – The Indian Pharmacopoeia, British Pharmacopoeia

v) Formularies – National formulary of India, National formulary of America.

3) Tertiary Sources - It include dictionaries, encyclopaedias, 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.-Statistical Table and Mathematical table to provide scientific data.



5		Solve any <u>Four</u>: (3 marks each)	12M																		
5	a)	<p>Differentiate between Drug Addiction and Drug Habituation. (any 6 points, 3 marks)</p> <table border="1" data-bbox="213 465 1396 1541"> <thead> <tr> <th data-bbox="213 465 807 546">Drug Addiction</th> <th data-bbox="807 465 1396 546">Drug Habituation</th> </tr> </thead> <tbody> <tr> <td data-bbox="213 546 807 741">1. It is a state of periodic or chronic intoxication produced by repeated administration of drug.</td> <td data-bbox="807 546 1396 741">1.It is a condition resulting from repeated administration of drug.</td> </tr> <tr> <td data-bbox="213 741 807 880">2.It is accompanied with physical and psychological dependence</td> <td data-bbox="807 741 1396 880">2.It is accompanied with psychological dependence only</td> </tr> <tr> <td data-bbox="213 880 807 960">3.Tolerance is developed</td> <td data-bbox="807 880 1396 960">3.Tolerance is not developed</td> </tr> <tr> <td data-bbox="213 960 807 1041">4.Tendency to increase the dose</td> <td data-bbox="807 960 1396 1041">4.No Tendency to increase the dose</td> </tr> <tr> <td data-bbox="213 1041 807 1180">5. Withdrawal symptoms are severe and require medical treatment.</td> <td data-bbox="807 1041 1396 1180">5. Withdrawal symptoms are not severe and are very less.</td> </tr> <tr> <td data-bbox="213 1180 807 1319">6.Person shows compulsion to take the drug</td> <td data-bbox="807 1180 1396 1319">6. Person has strong desire but not compulsion to take the drug.</td> </tr> <tr> <td data-bbox="213 1319 807 1458">7.Detrimental effect on both person and society</td> <td data-bbox="807 1319 1396 1458">7. No Detrimental effect on society.</td> </tr> <tr> <td data-bbox="213 1458 807 1541">e.g-Morphine, alcohol</td> <td data-bbox="807 1458 1396 1541">e.g.- Tea, coffee</td> </tr> </tbody> </table>	Drug Addiction	Drug Habituation	1. It is a state of periodic or chronic intoxication produced by repeated administration of drug.	1.It is a condition resulting from repeated administration of drug.	2.It is accompanied with physical and psychological dependence	2.It is accompanied with psychological dependence only	3.Tolerance is developed	3.Tolerance is not developed	4.Tendency to increase the dose	4.No Tendency to increase the dose	5. Withdrawal symptoms are severe and require medical treatment.	5. Withdrawal symptoms are not severe and are very less.	6.Person shows compulsion to take the drug	6. Person has strong desire but not compulsion to take the drug.	7.Detrimental effect on both person and society	7. No Detrimental effect on society.	e.g-Morphine, alcohol	e.g.- Tea, coffee	3M
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5	b)	<p>Classify antidotes with examples : (any 3 types of antidotes with any 1 example – 1 mark each)</p> <p>The antidotes are of 4 types.</p> <p><u>1. Physical antidote.-</u></p> <p>These substances inhibit the absorption of poison. e.g. Demulcents such as fats, oils and egg albumin. The demulcents form the coat on the mucous membrane and inhibit the absorption of poison.</p> <p>Banana is used for glass poisoning</p> <p>Charcoal – alkaloidal poisoning.</p>	3M																		

**MODEL ANSWER****SUMMER-19 EXAMINATION**

Subject Title: Hospital and clinical pharmacy

Subject Code: 0816

2. Chemical antidote :-

It is substance which interacts chemically with poison to form an insoluble precipitate which is nontoxic. (any 2 examples)

Poison	Antidote
Acid	Mg oxide, Cal oxide
Carbonic acid	MgSo ₄
Lead	Sulphates of alkali
Oxalic acid	Lime
Phosphorus	Copper sulphate
Alkaloids	Tannins

3 Physiological Antidote: It produces opposite action to that of poison without interacting chemically. (any 2 examples)

Poison	Antagonist /Chelators
Morphine	Caffeine, Naloxone
Organophosphorus compounds	Atropine
Strychnine	Chloroform
Arsenic	BAL, EDTA
Lead	BAL, EDTA, Penicillamine
Mercury	BAL, Penicillamine
Iron	Desferrioxamine B
copper	BAL, Penicillamine

4. Universal Antidote: When nature of ingested poison is unknown, the universal antidote is used.

	Ingredients	Quantity
1.	Powdered charcoal	2 parts
2.	Magnesium oxide	1 part



		3. Tannic acid	1 part	
5	c)	Define Bioequivalence. Explain first pass effect. Definition: (1 mark) A product is considered bioequivalent if its rate and extent of systemic absorption does not show a significant difference from the pioneer drug product when administered at same dose of active ingredient by the same route and under the same experimental conditions. First pass effect: (2 marks) 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 administration highly affects first-pass metabolism effect. Bioavailability of propranolol, oxyphenbutazone, chlorpromazine, and aspirin undergo first pass effect.		3M
5	d)	What are the objectives and functions (any three of each) of Hospital pharmacy? Objectives: (any 3 points, 1 ½ marks) 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 Functions: (any 3 points, 1 ½ marks)		3M



		<ol style="list-style-type: none">1. Dispensing of drugs, chemicals and pharmaceutical supplies.2. Dispensing of all narcotic drugs, alcohol & maintaining running stock account of the same.3. Filling and labelling of all drug containers.4. Inspection of all pharmaceutical supplies.5. To maintain satisfactory system of record and book keeping of all products available in hospital pharmacy.6. To maintain stock of approved drugs.7. To maintain adequate control over dispensing of all drugs.8. To maintain correct specification of drugs.9. To maintain correct costing of drug.10. To prepare large volume parenterals & other parenteral preparations & to maintain aseptic condition while manufacturing.11. To check quality of manufactured product.12. To give information concerning to medicines to physicians, interns & nurses.13. To prepare periodic & annual report about working of Hospital pharmacy.14. To implement decisions of PTC.15. To implement programme of education for pharmacist, nurses and interns.	
5	e)	<p>Define outpatient. Explain the Receipt and Issue system to outpatient.</p> <p>Definition: (1 mark) Outpatient means the patient who does not occupy bed in the hospital and is offered consultation, diagnosis and receives treatment.</p> <p style="text-align: center;"><u>OR</u></p> <p>An outpatient may receive general or emergency treatment which could be diagnostic, therapeutic or preventive without being admitted in the hospital.</p> <p>Receipt and Issue system: (2 marks)</p> <ol style="list-style-type: none">1. Patient in his first visit to OPD goes to registration counter .Take case paper after paying nominal fees.2. Then patient goes to general check-up counter –guided for medical department on the basis of clinical symptom.	3M



		<p>3. Physician write prescription for patient and he submitted it to pharmacy dept. where prescription is compounded and dispensed by pharmacist.</p> <p>4. Pharmacist numbers the prescription, monitors it and assembles the materials and equipment for compounding.</p> <p>5. Pharmacist gives token to the patient so patient and prescription can be identified.</p> <p>6. Compounded prescription filled in suitable container, packaged, labelled and priced reasonably.</p> <p>7. Pharmacist records prescription in a register for accounting purpose.</p> <p>8. While dispensing and compounding the drug correct delivery is ensured by checking token number. For his next visit prescription is given back to the patient.</p>	
5	f)	<p>Define and classify poisons.(definition 1 mark, classification 2 marks for any 4 classes)</p> <p>Poison is any substance taken in the body by ingestion, inhalation, injection or absorption that interferes with normal physiological function.</p> <p style="text-align: center;"><u>OR</u></p> <p>A poison can be defined as a chemical substance which when administered, inhaled or Swallowed is capable of producing harmful or lethal effect on the body.</p> <p><u>Classification:</u> Depending upon mechanism of action of poison, these are classified as</p> <p>1) Corrosives-(any one example)</p> <p>a) Strong acids- sulphuric acid, nitric acid, hydrochloric acid</p> <p>b) Organic acids- oxalic acid , carbolic acid</p> <p>c) Concentrated alkalies- caustic potash, caustic soda, carbonates of sodium, calcium and potassium</p> <p>2) Irritants- (any one example)</p> <p>a) Inorganic: 1. Non- metallic- Phosphorous, chlorine , bromine, Iodine 2. Metallic- Lead, Mercury, copper, zinc, arsenic , manganese</p> <p>b) Organic: 1. Animal origin- Snake, scorpion, Insects, Cantherides 2. Vegetable origin- Ergot aloe, capsicum, castor oil seeds etc.</p> <p>c) Mechanical- Powdered glass</p>	3M



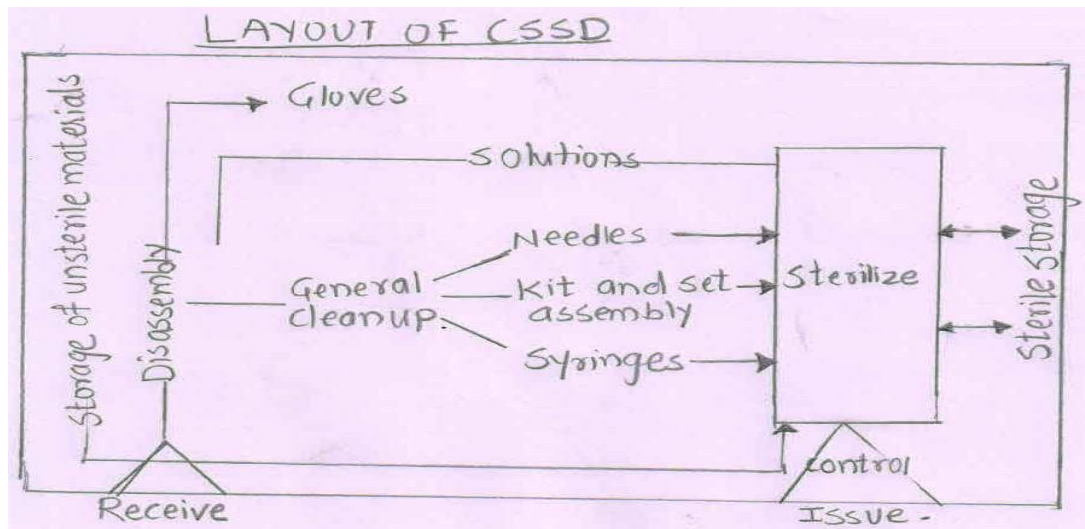
	<p>3) Neurotics-(any one example)</p> <p>a) Cerebral poison- opium , sedatives and hypnotics, insecticides, cocaine and hyoscyamus</p> <p>b) Spinal poisons- Nux vomica</p> <p>c) Peripheral poisons- curare alkaloids, conium</p> <p>4) Cardiac- (any one example)</p> <p>e.g. Digitalis , stropanthus, aconite, tobacco</p> <p>5) Pulmonary depressants- Substances acting on lungs</p> <p>e.g. Gases such as carbon monoxide, coal gas</p> <p>6) Miscellaneous- Analgesics, antipyretics, stimulants, antidepressants, antihistamines, hallucinogens.</p>	
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6	Solve any FOUR : (4 marks each)	16M
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6	a) Describe the location and layout of central sterile service room.(location 1 mark, layout 3 marks)	4M
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Location: It should be centrally located in the hospital or near a place where bulk of the supplies are required as operation theatres which contributes about 75% of the work of this department. The store and laundry should be very near.

LAYOUT



It consists of series of working station in dirty,non sterile area which are separated from sterile by Autoclaving and different sterilizing equipment. In layout, sterile area is established having



		<p>different sterilizers</p> <p>i) At the entrance, Non sterile items like gloves, syringe and needle, rubber gloves, surgical instrument and dressing, urine and blood collection sets, etc are received.</p> <p>ii)The Non sterile item then passes for sorting and disassembly purpose</p> <p>iii) It goes for general clean-up 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</p> <p>iv) Then these items pass through partition zone to sterile area for sterilization in different sterilizer.</p> <p>v) Finally the sterilized item comes to the sterile storage area.</p> <p>vi) From this area, these items are issued or distributed to various departments through clear area.</p> <p>The purpose of such layout is to minimize cross flow of non-sterile item with sterile item thereby eliminating the possibility of error of contamination.</p>	
6	b)	<p>What is (ADR) – Adverse Drug Reaction? Give the classification of ADR. Give the reasons for ADR. (definition 1 mark, classification 1 mark, any 4 reasons 2 marks)</p> <p>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”.</p> <p>Classification of ADRs:</p> <p>A) Predictable ADRs:</p> <ol style="list-style-type: none">1. Excessive Pharmacological effect.2. Secondary Pharmacological Effects.3. Rebound response on discontinuation. <p>B)Unpredictable ADRs:</p> <ol style="list-style-type: none">1. Allergic drug reaction and Anaphylaxis.2. Idiosyncrasy.3. Genetically determined Toxicities.4. Toxicity following drug withdrawal.	4M

**Reasons for ADR:****1. Medication errors:**

- Self medication of OTC drugs by patient leads to over use or misuse of drug. It may result into excess pharmacological action or complications.
- 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 reactions.

3. Sudden withdrawal of drugs: Therapy with drugs like corticosteroids and hormones cannot be suddenly stopped. Such drugs therapy is gradually stopped by decreasing the dose.

4. Bio-availability variations: There are number of brands of the same drug which leads to variations in bio-availability of drugs.

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

6. Drug interaction and drug food interaction: This type of interaction occurs when two or more drugs or presence of food may inactivate or alter the absorption of drug results in inactivation.

7. Some drug having narrow margin of safety: Difference between therapeutic dose and toxic dose is very narrow in some drugs, e.g. Digitalis if not prescribed carefully leads to its toxicity.

8. Patient factors:

a) Age: Young and old patients are more susceptible to adverse drug reactions as compare to the adults, because of pharmacokinetics pattern at this age.

b) Disease state: Mainly patients with hepatic or renal dysfunction 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 haemolytic anaemia.



		9. Discontinuation of therapy /treatment due to : High cost of medicine, Lack of faith on physician or Noncompliance.	
6	c)	Write the role of pharmacist in patient counselling.(any 8 points, 4 marks) Role of Pharmacist in patient counselling- 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. 2) Route of administration- It is important for the pharmacist to inform the patient about the route of administration of drug, whether the drug is to be taken orally or it is to be 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. . 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. 5) Storage of drugs- The pharmacist should instruct the patient regarding storage of drugs as per label 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 colour 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	4M



		<p>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.</p> <p>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.</p>	
6	d)	<p>Discuss four important factors governing make or buy decision. (4 marks for 4 factors)</p> <p>Four important factors are:</p> <p>1) QUALITY-The quality of outside purchases & the quality that could be possibly achieved when manufactured within the hospital are compared. If there are no wide variations between these two, it is not an important consideration .if there is a wide variation, it becomes crucial factor. If a better quality results from in-house manufacturing, the matter should be probed further. Why do the outsiders fail to come up to the desired quality level? Also, is the hospital competent to produce the desired quality? Does it have the necessary infrastructure? Most of the times, as in case of large volume fluids, the hospital favors in-house manufacturing as it has a legitimate apprehension that an outsider may compromise with the quality of his supplies.</p> <p>2) QUANTITY-Generally, those items whose orders are too small to purchase it from an outside supplier are manufactured within the hospital. Similarly, items which are required every day for use in hospitals, in large quantities, are generally decided to be manufacture. Break-even analysis gives the hospital the break-even quantity of production. Break-even is at a point where there are no profits and no losses.</p> <p>3) COST-Here we compare the costs of buying from outside with the cost of in-house manufacturing. The cost of manufacturing the items within the hospital is estimated by drawing up a cost-sheet. It is important to allocate over-heads correctly. Cost and quantity together considered for making the decision.</p> <p>4) SERVICE: Generally, a supply is more assured when a hospital makes an item then when it buys it. Assured supply is often a valid reason for manufacturing. Interruption in supplies may affect the major clinical series of the hospital. Unfair practices of outsider make a hospital opt for making rather than buying.</p>	4M



6	e) Describe procurement or purchase procedure step-by-step. (4 marks) 1. Purchase request form/purchase requisition- Pharmacist or person authorized by him prepares and fills purchase request form. This form provides information to purchase dept. regarding description, packaging, specifications, price, quantity needed, inventory balance 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. Seven copies of purchase order are prepared – 1) a copy for the supplier for supply of materials 2) a copy for the account section for audit 3) a copy for the purchase section for filing 4) a copy for the department from where purchase requisition originated 5) Two copies for the receipt section of stores out of which one is used once the goods arrive for checking and the other when the goods are returned 6) a copy for history with the purchase section to ascertain the rates and other information in future. 4. Receipt of goods- When the ordered goods comes in dept. the quantities and prices are checked. Invoice of supplier is compared to the purchase order. Received goods bill sent to the account section where bill is entered in purchase record register. If a part of order is returned to supplier, it contains Goods Returned Note (1 copy to supplier and 1 to the department) 5. Release of payment to supplier.	4M
6.	f) Explain floor stock system. (2 marks for explanation, 1 mark each for any 2 merits and any 2 demerits) The medicines or drugs are stored in pharmacy and supplied or distributed to the wards or rooms on order and kept under the supervision of registered nurse at nursing station are called floor stock drugs. It is classified further into	4M



a) Charge floor stock drug:- Drugs which are stocked on the nursing station at all time and are charged to the patient account .An envelope is used to dispense the drugs to the nursing station.

b) Non Charge floor stock drug:- Drugs which are placed at the nursing station at all time and for which there may not be direct charge to patient's account. The cost is calculated in the per day cost of hospital room. Drug basket method or Mobile dispensing unit is used to dispense the drugs to the nursing station.

Merits: (any 2 Merits – 1 mark)

1. The deteriorated, out dated and non-approved drugs and drug samples may be removed quickly through the routine checking of the cabinets.
2. The nursing station drug cabinets are under the continuous supervision of the pharmacist.
3. Less number of pharmacy staff is required.
4. Ready availability of required drugs.
5. Minimization in patient prescription orders at pharmacy.

Demerits: (any 2 Demerits – 1 mark) 1. It consumes nursing personnel time.

2. There are chances of medication errors because personally pharmacist cannot take review of requirement of medications.
3. Increase in drug inventory at nursing stations.
4. Special facilities are required in nursing stations for storage of drug.