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		**Solve any EIGHT Questions : (2 marks each)**	**16M**
1	a)	**Define the following terms: (any two) (each definition - 1 mark)** i) **Drug abuse**- It is an inappropriate and persistent use of drugs beyond medical need. ii) **Pyrogens**- Pyrogens are metabolic products of micro-organisms which produce rise in body temperature on injection. iii) **Hospital-**It is the complex organization utilizing combination of specialized scientific equipments and functioning through a group of trained people educated to a problem of modern medical science and maintenance of good health. **OR** The hospital is defined as the 'an institution of community health. 'Its function embrace the entire spectrum of medical care prevention, diagnosis, therapy, rehabilitation, education and research.	**2M**
1	b)	**Give normal values with significance: (any two) (1 mark each for normal value and significance)** **i) Blood cholesterol** **Normal value:** 150-240 mg/dL or mg % **Significance:** **Total cholesterol — Diseases** 300-400 mg% — Coronary thrombosis 400-500 mg% — Diabetes 500-600 mg% — Obstructive jaundice 600-700 mg% — Nephritis Below 80-100 mg %, it could be hyperthyroidism and pernicious anaemia	**2M**

		ii) ESR **Normal Value: Westergren Method:** Male 0-15 mm at end of one hour Female 0-20 mm at end of one hour **Wintrobe Method** : Male 0-9 mm at end of one hour Female 0-20 mm at end of one hour **Significance: -** Increase in ESR suggests possible pathological conditions like rheumatoid arthritis, TB, pneumonia, allergy, malignant tumour, syphilis etc. ESR decreases in polycythaemia, sickle cell anaemia, protein shock, burning case etc. **iii) Sperm count** **Normal value:** 60 -150 millions/ml of seminal fluid **Significance:** Persons with low counts (less than 60 millions/cc) might show infertility.	
1	**c)**	**Translate into English: (any four) (½ mark each)** i) **Collyrium**– an eye lotion ii) **Tussis**– a cough iii) **Dolore urgente** – when the pain is severe iv) **Unus** - one v) **Hora somni** - at bedtime	**2M**
1	**d)**	**State the meaning of: (any two) (each meaning 1 mark)** i) **Carminatives** – these are the drugs which expel gases from stomach and intestine and are used to relieve flatulence and in intestinal colic. ii) **Anorexia**– loss of appetite iii) **Necrosis** – death of cells or tissues	**2M**
1	**e)**	**What advice must be given to patients while using following drugs? (any two) (each drug 1 mark)** i) **Haematinics** – may colour faeces reddish brown to black.	**2M**

		ii) **Diphenhydramine**- It may cause sedation or drowsiness so do not drive. iii) **Amoxycillin**– 1. 'May cause diarrhoea'. 2. It should be taken on empty stomach i.e-1hour before or 2 hours after meal. 3. Complete the course otherwise reoccurrence may be occur	
1	**f)**	**What is 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.	**2M**
1	**g)**	**What do these abbreviations stand for? (½ mark each)** i) **CCF** – Congestive Cardiac Failure ii) **BAL** – British Anti-Lewisite iii) **ECG** – Electrocardiogram iv) **LAL** – Limulus Amoebocyte Lysate	**2M**
1	**h)**	**Write one example of each poison:(½ mark each for any 1 example)** (i) **Corrosive**- Sulphuric acid, nitric acid, hydrochloric acid, oxalic acid, sodium hydroxide, potassium hydroxide, carbonates of sodium, calcium, potassium,caustic soda,caustic potash. (ii) **Irritant** -Phosphorous, chlorine , bromine, Iodine, Lead, Mercury, copper, zinc, arsenic , manganese, Snake, scorpion, Insects, cantharides, Ergot, aloe, capsicum, castor oil seeds. (iii) **Neurotic**- opium , sedatives and hypnotics, insecticides, cocaine and hyoscyamus, nux vomica, curare alkaloids, conium (iv) **Mechanical**-Powdered glass, Asbestos, Diamond dust, Chopped hairs	**2M**

1	i)	**Write uses of (any two) (1 mark each)** i) **CT scanner -** It is an advanced technique used for morphological examination of neurological organs, head, eyes, neck, spinal cord etc. ii) **Foley's catheter** – It is used to decompress urinary bladder or to drain bladder in case of urine retention. iii) **Scalpel** – It is used to make an incision.	**2M**
1	j)	**Mention doses of (any two): (1 mark each)** i) **Dimercaprol -**It is administered in a dose of 3-5mg/kg I.M at the interval of 4 hours for first 2 days, interval of 4 to 6 hours for additional 2 days and interval of 6 to 12 hours for additional 7days ii) **EDTA -** Dose-75 mg/kg 24hrs I.M given in 3-6 divided doses for 5 days may be repeated for a second course after a minimum of 2 days, iii) **Desferrioxamine**-Oral 8 to 12 grams in 40 to 60 ml distilled water I.V. 2 gram in 5% laevulose solution	**2M**
1	k)	**Name four quality control tests for parenterals. (each test ½ mark)** • Sterility test. • Pyrogen test. • Clarity test. • Leaker test.	**2M**
1	l)	**State meaning of (any two):** i) **Cold –** temperature between 2 to 8 ^{0}C ii) **Cool**– temperature between 8 to 25 ^{0}C iii) **Freeze**– temperature 0 ^{0}C or below 0 ^{0}C	**2M**

2		**Solve any FOUR questions: (3 marks each)**	**12M**
2	**a)**	**Classify hospitals on the basis of ownership.(3 marks for classification)** On the basis of ownership hospitals classified as 1) Public 2) Private **1) Public hospitals are owned by Government.** **a) Central Government Hospitals** - Military hospital - Railway hospital - All India Institute of Medical sciences, New Delhi. -JIPMER **b) State Government Hospitals** - J.J. Hospital- Mumbai - Sassoon hospital-Pune - Ghati hospital- Aurangabad - ESIS Hospital- Mulund -Victoria hospital- Bengaluru -Stanley hospital- Chennai -Civil hospital- Jalgaon **c) Local-Self Government Hospitals** - BMC Hospital-Sion,Mumbai - KEM Hospital- Parel, Mumbai	**3M**

- Cooper hospital- Vile Parle, Mumbai

-Bhagwati hospital-Mumbai.

2) Hospitals owned by Private:

a) Private Trust hospital

- Bombay hospital-Marine lines , Mumbai

- Jaslok hospital- Mumbai

- Rajasthan hospital- Ahmedabad

-Jindal hospital- Bengalaru

b) Hospital owned by Religious Trust/bodies

- Hindu Mission Hospital- Chennai

- Al-Ameen Hospital- Bengalaru

- Christian Medical College Hospital – Vellore

-Minakshi Mission Hospital- Madurai.

c) Private Company Hospitals

-Fortis Hospital-Bengalaru

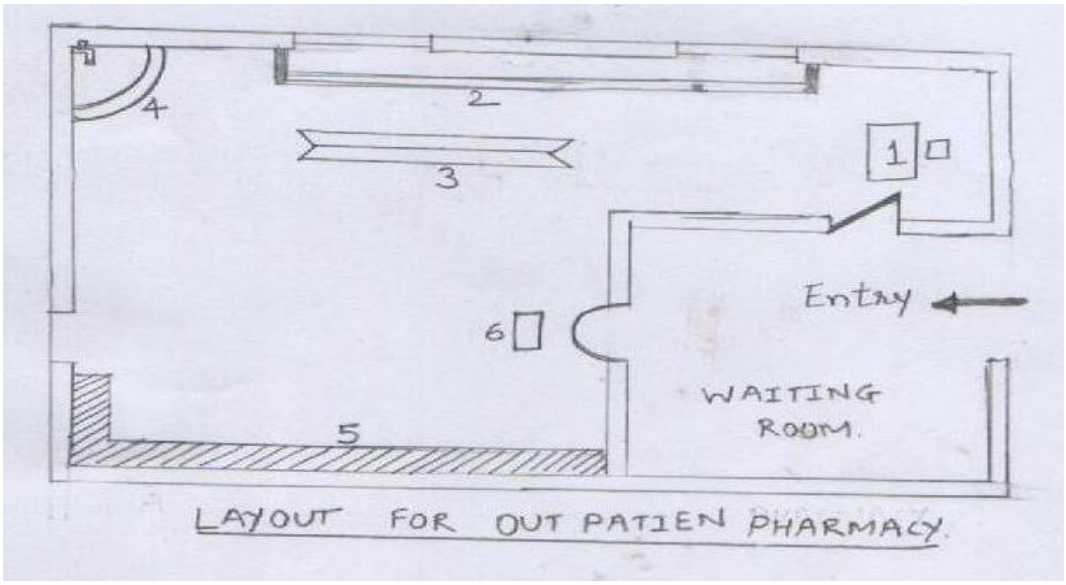
- Apollo Hospital- Chennai

-Medinova Hospital- Gujarat

-HMT Hospital- Hyderabad.

g) Private Clinics/Nursing Homes

Such clinics are owned by an individual doctor or a group of doctors in towns or big cities and serve for 24 hrs.

2	b)	**Draw a layout of outpatient pharmacy.(3 marks)**  1. Table and chair 2.Preparation table 3.Storage rack 4. Sink with tap 5. Medicine platform 6.Dispensing window	**3M**
2	c)	**Differentiate between drug addiction and drug habituation.(any 6 points, 3 marks)**	**3M**

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.
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	
2	**d)**	**Write pathophysiology, signs and symptoms of Tuberculosis OR Hepatitis.** Tuberculosis is infectious disease caused by several species of Mycobacterium tuberculosis. They collectively termed as tubercle bacilli. **Pathophysiology :- (1 ½ marks)** The bacillus that causes TB is tiny rod shaped germ. These germs are protected by an outer layer of wax which prevents the normal defence of the body from destroying them. TB may attack any part of the body such as bones, joints, glands, lymph nodes, eyes, kidney etc. but it especially attack on lungs causing pulmonary TB. These germs can live for months in any place especially in a damp area. Tuberculosis is spread through the air, when people who have the disease cough, sneeze, or spit. When the germs enter into the lungs, the body defence, i.e. W.B.C surround the germs and swallow them .But because of waxy coat, many germs continue to live for months. The larger WBCs then move in building a wall of resistance against the invaders. This is known as 'tubercle'. Reactivation of bacilli due to decreased immunity, as in malnutrition or old age or due to imunosuppressants. The tubercle may disappear leaving a hole or cavity. Large masses of scar tissue may form around this area. This hinders the flow of blood and interferes with normal functioning of lungs.	**3M**

Signs & Symptoms: (1 ½ marks)

Primary Tuberculosis:

-Initial infection does not produce any signs & symptoms. Incubation period is 4-8 weeks.

-Mild fever and malaise may occur.

Secondary or Pulmonary tuberculosis:

Fever up to 40^{o}c in late afternoon or evening & sweat at night

- General malaise, fatigue & weight loss
- Cough in early morning. Green or yellow sputum with blood streaks.
- Chest pain and dyspnoea.
- If pulmonary artery in tubercular region ruptures,-massive haemorrhage.
- The infection may spread to pericardium. It causes inflammation and restriction in motion that may lead to heart failure.

Chronic/ Miliary tuberculosis:

In this case lesions are found at lymph node kidney, meninges, spleen, bone marrow and other organ. Difficulty in breathing, weight loss, fatigue and GIT disturbances.

OR

Hepatitis: (pathophysiology of Hepatitis A OR Hepatitis B) (1 ½ marks)

Pathophysiology of Hepatitis –A

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 that causes degenerative changes means swelling of liver cell and subsequent necrosis may occur. Infective viral particle spread into blood, bile & other body secretions, Hepatotropic viruses cause hepatic injury. Damage to liver cells is caused by fibrosis (Blood clot) in the liver. **OR** **Pathophysiology of Hepatitis B** Virus replicate in liver and its fragment get incorporated in liver cell membrane. There is production of antibody like IgM, IgG against the virus. This antibody attack foreign plasma membrane of liver cell and thus cellular immunity develops which damage the liver. The manifestations are because of immune response infection. **Signs and symptoms : (1 ½ marks)** 1. Uneasiness, nausea vomiting with fever. 2. Loss of appetite and body weight. 3. The epigastric discomfort described as a sense of fullness or pain is common. 4. Changes in smell, taste and sense with pharyngitis and cough. 5. Elevation of SGPT and SGOT levels 6. Urine darkens due to rise in bilirubin (jaundice) serum level to about 2mg /100ml(Normal 0.3 TO 1.1mg /100ml)	
2	**e)**	**Define Adverse Drug Reaction. Classify ADR with examples. (definition - 1 mark, 2 marks for classification with any 1 example each)** **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".	**3M**

Classification of ADRs:

A) Predictable ADRs:

1. Excessive Pharmacological Effect.
2. Secondary Pharmacological Effects.
3. Rebound response on discontinuation.

B)Unpredictable ADRs:

1. Allergic drug reaction and Anaphylaxis.
2. Idiosyncrasy.
3. Genetically determined Toxicities.

Examples:

1. Excessive Pharmacological effect :

It is common experience of patient receiving CNS depressants, cardioactive, hypotensive and hypoglycemic agents. If excessive dose is given, all patients are at risk of developing this reaction. Certain patients are more susceptible to this reaction even when average dose is prescribed.

a) Patient with Kidney disease who have lost more than 70% of their kidney function

b) Patients with hypoalbuminemia due to failure of albumin production by liver or excessive loss of albumin as in nephrotic syndrome.

c) Patients age – Neonates, infants and elderly patient.

2. Secondary Pharmacological Effects

It is mainly observed in patients, who consumes OTC drugs or go for self-medication .e.g. Drugs like Antihistamine used mainly as anti-allergic particularly for common cold and cough , but it may produce drowsiness in large repeated doses for repeated doses on self-medication.

3. Rebound response on discontinuation

- Rebound hypertension on sudden discontinuation of hypotensive agents like clonidine.
- Sudden withdrawal of corticosteroids causes acute adrenal crisis (Addison's disease).
- Confusion, delirium, tachycardia, convulsions and extreme agitation after the discontinuation of long-term CNS depressants like benzodiazepines, barbiturates and alcohol.

Unpredictable ADRs

1.Allergic drug reaction and anaphylaxis

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, methyldopa
Leucopenia	Sulphonamide, Thiouracil, Phenylbutazone
Nephritis	Methicillin, oxacillin ,nafcillin

2.Idiosyncrasy

It includes the drug induced foetal abnormalities, such as phocomelia developing in offspring of mothers exposed to thalidomide.

Cancer of Organ	Causative drug
Vaginal adenocarcinoma	High doses of stilbesterol during pregnancy
Kidney pelvis	Analgesic induced nephropathy
Uterus	Oestrogens (long term)
Lymphoid tissue	Azathioprine, cyclophosphamide

3.Genetically determined Toxicities

Hereditary condition	Drug causing toxicity.
Pseudocholinesterase deficiency	Succinylcholine
Porphyria	Barbiturates, sulphonamides
Glucose -6-phosphate dehydrogenase deficiency.	Antimalarials, quinidine, sulphas, nitrofurantine.
Glaucoma	Corticosteroids
Methaemoglobinemia	Phenacetin, salicylates.

2	**f)**	**Define Bioavailability. Enlist factors affecting bioavailability of drugs.** **(definition - 1 mark, 2 marks for list of factors)** **Bioavailability** defined as the rate and extent at which the drug reaches the systemic circulation in the active form. **Factors Affecting Bioavailability:-** **1) Physical properties of drug:-** a) pKa of the drug b) Partition coefficient c) Particle size **2) Pharmaceutical factors:-** a) Dosage forms b) Manufacturing variables c) Dissolution rate **3) Physiological factors:-** a) Effect of GIT fluids b) G.I transit time c) First Pass effect d) Diseased state	**3M**
3		**Solve any FOUR questions (3 marks each)**	**12M**
3	**a)**	**Give any six functions of hospital. (½ mark each)** **Functions of Hospital**: The main functions of the hospital are: **1. Patient care:** It includes services for diagnosis, prophylaxis and treatment of diseases to the sick or injured patients. It is a 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	**3 M**

		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 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 patient and community. **5. Patient Counselling**: It is a modern concept adopted in big hospitals for the well-being of the patients. During these counselling sessions pharmacist educate people on communicable diseases, epidemics and family welfare etc. **6. Co-ordination**: It is a link between general public and policy makers.	
3	**b)**	**Enlist different abilities a hospital pharmacist should possess and explain any one ability. (1 ½ marks – enlist, 1 ½ marks -explanation)** The hospital pharmacist should possess following abilities: 1. Administrative ability 2. Technical ability 3. Manufacturing ability 4. Research ability 5. Teaching/Training ability 6. Ability to Control	**3 M**

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

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

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

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

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

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

3	c)	**Discuss the role of PTC in drug safety.** **Role of PTC in Drug safety** – The PTC plays an effective role in ensuring drug safety on a continuous basis by creating safety awareness in all departments of the hospital. The PTC provides following guidelines to hospital administration. 1. Employment of qualified registered pharmacist with at least B. Pharm degree holder as the chief pharmacist & rest are diploma holders. 2. Takes care that dispensing is done only by the pharmacist. 3. Sufficient number of pharmacists are employed. 4. Proper & adequate storage facilities are provided in pharmacy. 5. Poisonous material & non-poisonous material are stored separately. 6. Pharmacy should have adequate equipments. 7. External preparations are kept separately from internally used preparations. 8. Follow of GMP effectively in the in-house manufacturing unit. 9. Stock & issue of narcotic & psychotropic substances shall conform to the legal requirements. 10. Hospital shall have a drug formulary which is periodically revised & kept up to date. 11. Expired & deteriorated drugs are physically separated. 12. Providing a library & documentation facility.	**3 M**
3	d)	**What is unit dose dispensing? Write benefits of UDD.(1 mark - definition, 2 marks for any 4 benefits)** **Unit dose dispensing-** Unit dose dispensing is an in-patient drug distribution system in which medications which are ordered, packed, handled, administered and charged in the form of multiples of single dose unit containing a predetermined amount of drug for one regular use or application. **Benefits of unit dose dispensing-** 1. The patients are charged for those doses which are administered to them. 2. It reduces the medication errors since the pharmacist checks the copy of physician's	**3 M**

		original order. 3. It avoids drug losses, no pilferage of drug. 4. Less space is required at nursing stations as compared to floor stock. 5. Patients receive the nursing service 24 hrs a day. 6. It avoids duplication of orders and extra paper work. 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.	
3	**e)**	**Explain the role of pharmacist in patient counselling. (½ mark each-6 roles)** **Role of Pharmacist in patient counselling-** **1) Name of the drug and its action**- The pharmacist should inform the patient about the name of drug and its common name, if any. 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 applied locally or to be used into eye, ear or nose or inserted rectally or vaginally. The pharmacist should ensure that the patient understands how to use ophthalmic preparations, and suppositories. **3) Time of administration-** The pharmacist should instruct the patient when to take the medication e.g. some drugs should be taken on empty stomach i.e. about 1 hour before meal or 2-3 hours after meal to ensure adequate absorption of drug. The patient should be provided for the medication calendar. **4) Duration of therapy-** The pharmacist should encourage the patient to continue taking the medicine for the prescribed duration of the treatment. He should explain that the	**3 M**

		course of treatment must be completed to achieve best results. **5) Storage of drugs**- The pharmacist should inform the patient regarding storage of drugs; those are labelled on the container. The patient should be advised to store the drugs in a separate cabinet where children will not reach. **6) Side effects of drugs-** The patient should be informed about the known side effects of the drugs. This knowledge will help the patient to follow treatment without any fear and thereby improve the compliance of patient. e.g. change in colour of urine, stool; drowsiness, **7) Contraindications (Restrictions) -** The patient should be informed well that he should avoid certain drugs and foods during the therapy. E.g. Restriction of Tyramine containing food in patients on MAO inhibitor therapy **8) Allergic reactions**- Before dispensing the drugs like penicillin or sulphonamide, the pharmacist should ask the patient about his allergic reactions in the past. It helps in avoid in further complications of treatment. **9) Removal of drug from package**- The patient is not familiar with the packing of the product, as the pharmacist. Hence, the pharmacist should demonstrate the method of removal of drug from the package to the patient so that he can handle it properly. **10) Refill information-** The pharmacist should inform the patient verbally, whether the prescription is refillable, or not. If it is, then for how many times it should 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 after completion of treatment.	
3	**f)**	**Explain how purchase order is prepared?** **Purchase order is prepared in 2 steps-** **Step 1- Purchase requisition:** Once the specifications are drawn, a purchase requisition is prepared. The requisition carries the description of items needed, their packaging, their price, their quantity. It may also mention the quantity right now in hand and the quantity required for future period. The original requisition is sent to the administrative head of the concerned department. Once approved by administrative head, it is sent to the purchasing officer. One copy is	**3 M**

		retained by the pharmacist. Several copies of purchase order can be prepared. **Step2- Purchase order:** After the receipt of purchase requisition, the purchase officer/pharmacist prepares a detailed purchase order in a printed form. The items are systematically order by spelling out the specifications, prices and quantities of ordered. Then 7 copies of purchase order are prepared. 1st copy—Sent to supplier by post or hand delivery for supply. 2nd copy--Sent to accounts department where it will be retained for accounting. 3rdcopy—Retained by purchasing officer for his departments file. 4th copy—sent to the department from where 'request form' is received. 5th & 6th copy—Completion of 5th copy is done if articles are received and sent to account departments and 6th copy is utilized only when goods are back ordered. 7th copy---Is history copy is kept by purchase officer to ascertain rates and for other things in future use. When the supplies are obtained they are carefully checked with purchase order. If it is according to the given order, the supplies are retained; if not even in part that part or whole lot is returned to supplier immediately with goods. Returned note and a credit note are obtained from the supplier. The supplies received are entered on the Purchase Record Register and complete inventory is prepared. This supply is then ready for dispensing to inpatients or outpatients.	
4		**Solve any FOUR questions (3 marks each)**	**12M**
4	**a)**	**Define clinical pharmacy. Give different roles of clinical pharmacist.(1 mark-definition, 2 marks – any 4 roles of clinical pharmacist)** **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	**3M**

		use of drugs. **Role of clinical pharmacist—** **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 findings to physician. **3. Participation in ward rounds**- The clinical pharmacist with physicians participates in ward rounds, observe individual patient and decide the drug therapy. **4. Drug information**- The clinical pharmacist establish drug information centre. The drug info is available at this centre and utilized suitably. This data is sent to physician as per their requirements. **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. **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. **7. ADR management**- Along with physicians, clinical pharmacist is actively involved in reporting and management of ADR. **8. Educational Programme-** Clinical pharmacist organizes educational programs for Nursing and education related to safe and effective use of drugs. **9. Tailoring drug therapy**- Clinical pharmacist after the diagnosis of physician formulates drug therapy to clinical need of patient.	
4	**b)**	**Write three administrative patterns of central sterile service department.** **(1 mark each)** **1- Department as a part of Nursing services-** The majority of items to be dispensed are used by the nurses for the patients care. She should therefore be work as head of this department.	**3 M**

		2- Department under a pharmacist- Pharmacist by taking training is competent to handle the functions of this department.i.e-purchase, storage and distribution of supplies and also the preparation of sterile solution. **3- Department under dual control of pharmacist as well as nurse-** Some functions of the department like cleaning, packaging and distribution of medical supplies and equipments should be placed in charge of nurse whereas manufacturing of sterile solutions should be placed in charge of pharmacist.	
4	**c)**	**Comment on various sources of drug information.(1 mark for each source)** **Sources of drug information-** **1.Primary sources –** Information obtained from basic researches and developments which are published for first time .e.g. Peer reviewed journals-International Journal of Pharmaceutics, Indian Journal of Pharmacology, Journal of Pharmacy and Pharmacology. **2.Secondary sources –** Information in the form of abstracts, journals, periodicals, references and official books is called secondary sources. i) Abstract Services: Chemical Abstract Service, Pharmaceutical Abstract Service. ii) Text books –Text book of Hospital Pharmacy, Clinical Toxicology. iii) Reference books- Remington's Pharmaceutical Sciences, Merck Index iv) Pharmacopoeias – The Indian Pharmacopoeia, British Pharmacopoeia v) Formularies – National Formulary of India, British National Formulary. **3) Tertiary Sources -** It includes dictionaries, encyclopaedias, and 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 Websites: Drugscontrol.org, who.int, usfda.org	**3 M**

4	d)	**Enlist methods of drug distribution in hospital. Give advantages and disadvantages of floor stock system. (1 mark enlist, 1 mark for any 2 advantages & 1 mark for any 2 disadvantages.)** **Methods of drug distribution in hospital-** **I) Outpatient services** II) **Inpatient services-** It includes i) Floor Stock System ii) Unit Dose Dispensing System iii) Individual Prescription Order System iv) Combination of Floor Stock and Individual Prescription Order System **Advantages of floor stock system-** 1. The drugs are easily available at the wards and nursing units. 2. Elimination of drug returns. 3. Reduction in number of drug transcription orders at pharmacy. 4. Reduction in the number of pharmacists required. **Disadvantages of floor stock system-** 1. Chances of medication error may increase. 2. Increased drug inventory at wards and nursing units. 3. Greater opportunity for spoilage of the drug as they are stored in large quantity. 4. Increased hazards associated with drug deterioration.	**3 M**
4	e)	**Explain food drug interactions with examples. (any 6 examples)** Food affects the absorption of the drug. It may be attributed to 1) Dilution of the drug 2) Adsorption or complexation of drug 3) The alteration of gastric emptying. Examples: 1) Food reduces the absorption of aspirin, isoniazid, tetracycline, benzylpenicillin, amoxicillin, Ampicillin, levodopa and Rifampicin 2) Food increases the absorption of hydralazine, Nitrofurantoin, lithium citrate, riboflavin, carbamazepine, metoprolol, propanolol, and spironolactone.	**3 M**

		3) Iron absorption is reduced if food has been taken within the previous two hours. On the other hand, nausea is more likely if iron is taken on empty stomach so iron tablets are often given with food. 4) Nitrofurantoin is given with food to avoid GIT irritation. 5) Meals containing high fat increase the absorption of fat soluble drug Griseofulvin. Fat containing drug increases degree of ionization of Griseofulvin, so increases its absorption. 6) The diuretic effect of tea takes place rapidly if given before meals but diuresis is delayed if it is given after food. 7) The absorption of nitrazepam, glibenclamide, metronidazole, oxazepam, theopylline is unchanged by food. 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. 9) Milk reduces absorption of tetracycline by forming an insoluble complex	
4	**f)**	**Write pathophysiology & signs &symptoms of diabetes.(1 ½ marks each)** **Pathophysiology-** Lower levels of insulin results in over-production of hepatic glucose and its underutilization. This results in hyperglycemia. In presence of insulin, glucose enters into cells of adipose tissue and muscles and ise used up. Due to lack of glucose, muscle cells carries out glycogenolysis and gluconeogenesis. Lack of glucose and insulin in adipose tissue causes impaired triglyceride synthesis and release of free fatty acids which are metabolised in the liver to form ketones. Hyperglycemia results in glycosuria which leads to polyuria, polydipsia and dehydration. As glucose level rises, glucoprotein is deposited in the capillaries. Glucose is metabolised to sorbitol which is responsible for development of cataracts and neuropathy.	**3 M**

		Signs & symptoms- • Hyperglycemia • polyuria • polydipsia • polyphagia • Weight loss • Decreased muscle strength • Irritability • Slow wound healing process • Itching • Ketonuria • Nocturia • Blurred vision	
5		**Solve any FOUR questions (3 marks each)**	**12M**
5	**a)**	**Define and classify surgical dressings with one example each. (1 mark- definition , 2 marks – classification)** **Surgical dressings** - Surgical dressings are the materials which are used for the dressing of wounds as coverings, absorbents, protective or supports for injured or diseased tissues. **Classification of surgical dressings (2 marks)** **1.Fibers/Absorbents:** Absorbent cotton (medicated/non-medicated), Non- Absorbent cotton, eye pad, cotton ball, sanitary napkins. **2. Fabrics/Primary wound dressing:** Absorbent gauze, Absorbent lint, Gauze pad (gauze sponge). **3. Bandages:** Elastic bandages, Muslin bandage roll, Triangular bandage, Common gauze roller bandage. **4. Adhesive tapes/Self-adhesive plaster (Rubber /Acrylated based):** Zinc oxide adhesive plaster, capsicum plaster, Belladona plaster.	**3M**

5	b)	**Define patient compliance? Discuss factors that influence patient compliance. (1 mark for definition and 2 marks for any 4 factors)** **Patient compliance**- A faithful adherence by a patient to prescriber's instructions is called as patient compliance. **Factors that influence patient compliance- (Any 4 factors)** **1. Inappropriate packaging:** Sometimes design or size of container makes it difficult to remove the medicament. Many elderly patients, arthritis patients have difficulty with unit dose pack or foil wrapping while removing medicament. **2. Poor understanding**: Poorly handwritten labels are difficult to read or follow for the patient/pharmacist. Many prescriptions contain directions which are inadequate like take when required or use as directed that may produce confusion. **3. Multiple drug therapy**: Greater the number of drugs patient is taking, the higher is the risk of non-compliance. **4. Asymptomatic nature of patient**: In case of asymptomatic patient, it is difficult to convince a patient by explaining the value of drug therapy and this results in non-compliance. **5. Measurement of medication**: Many times there is confusion to the patient in measuring liquid preparations or number of tablets. **6. Cost of medication**: Because of high cost of drug, poor patients are unable to purchase such drugs. **7. Frequency of medication**: Higher the frequency of the medicines, the greater is risk of non-compliance. Many times regular schedule of dosage form cannot be followed due to work routine. **8. Duration of therapy**: Usually long duration treatment leads to patient non-compliance. **9. Illness**: The nature of patient's illness may contribute to non-compliance like chronic hypertension, mental illness. **10. Age**: Paediatric and geriatric patients contribute to non-compliance.	**3M**

5	c)	**Explain the role of computers in purchase and inventory control in hospitals.** **Purchasing & inventory control in Hospitals –** By using computers it is done by- **1. Periodic inventory control method**- In this method, quantities of drugs available in stock are manually checked. These are then compared with the minimum stock level & maximum stock level maintained on the computer. When the drug level reaches the minimum stock level purchase orders are placed by using computer. **2. Perpetual inventory control method** - In this method computer maintains running balance of all the drugs in stock. All the drugs are entered in database when new stock is received by pharmacy. Computer adds this to the initial stock & reflects current available stock. The quantities of drugs leaving the pharmacy are entered in the computer. Computer subtracts this from the initial stock & reflects current available stock. Whenever the drug level reaches the minimum stock level purchase orders are placed by using computer. Thus, the computer can list out minimum order quantity of each drug. In this way computer can help in inventory control- - 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.	**3M**

5	d)	**Classify pharmacodynamics drug interactions with examples.** **Classification:** **1) Interaction enhancing effect:**-e.g. Synergistic effect of Trimethoprim and sulphamethoxazole. MAOI and sympathomimetic drugs which increases activity. **2) Interaction inhibiting the effect:-** E.g Acetylcholine and atropine by competitive antagonism oppose the action of each other. Alcohol and amphetamines have opposite effects on CNS. **3) Alteration of electrolyte levels:** Drugs which cause alterations in fluid and electrolyte balance may modify the responses of tissues to drugs. e.g. Diuretics losing potassium, may cause hypokalaemia, in turn making the heart more sensitive to digitalis. **4) Drug interactions at same receptors:** Drugs that act at the same receptor site, if prescribed together, may produce additive effect or antagonize one another; e.g. respiratory depression and other central effects of morphine are antagonized by nalorphine. **5) Drug interactions at different receptors:** Drugs may interact on the same target organ, but at different receptor sites. E.g. Adrenaline activates adenylcyclase system and causes an increase in cyclic 3-5 AMP (Adenosine MonoPhosphate) which then acts as the mediator in a number of beta effects of adrenaline for relaxation of bronchial smooth muscles. Theophylline produces the same effect, an increase in cyclic 3-5 AMP, by inhibiting phosphodiesterase, and also causes bronchial smooth muscle relaxation. Thus, drugs that inhibit different enzymes may show synergistic effect.	**3M**
5	e)	**Define non-sterile manufacturing .Give list of equipments required in manufacturing of tablets. (definition – 1 mark, 2 marks – equipments)** **Non-sterile manufacturing:** The manufacturing of products that does not require sterilisation is called non sterile manufacturing. **Requirements for Tablets:** For effective operations, the tablet production department shall be divided into four distinct and separate sections as follows: -	**3M**

(a) Mixing, Granulation and Drying section

(1) Disintegrator and sifter

(2) Powder mixer

(3) Mass mixer/Planetary mixer/Rapid mixer granulator.

(4) Granulator

(5) Thermostatically controlled hot air oven with trays (preferably mounted on a trolley)/Fluid bed dryer.

(6) Weighing machines.

(b) Tablet compression section.

(1) Tablet compression machine, single/multi punch/rotatory.

(2) Punch and dies storage cabinets.

(3) Tablet de-duster

(4) Tablet Inspection unit/belt.

(5) Dissolution test apparatus

(6) In-process testing equipment like single pan electronic balance, hardness tester, friability and disintegration test apparatus.

(7) Air-conditioning and dehumidification arrangement (wherever necessary)

(c) Packaging section (strip/blister machine wherever required).

(1) Strip/blister packaging machine.

(2) Leak test apparatus (vacuum system)

(3) Tablet counters (wherever applicable)

(4) Air-conditioning and dehumidification arrangement (where ever applicable).

(d) Coating section (wherever required).

(1) Jacketed kettle (steam, gas or electrically heated for preparing coating suspension).

(2) Coating pan (stainless steel)

(3) Polishing pan (where applicable)

(4) Exhaust system (including vacuum dust collector)

(5) Air-conditioning and dehumidification arrangement.

(6) Weighing balance.

OR

Equipment	Examples
1.Mixer/Blender	Sigma blade mixer, tumbling mixers, Ribbon blenders.
2. Grinder /Sifter	Cutter mill, Hammer mill.
3. Dryers	Tray dryers, Fluidized 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.	

5 f) How is absorbent cotton wool evaluated as per IP? (3 marks for any 6 tests) **3M**

Evaluation of Absorbent Cotton Wool I.P.

1. Identification test:

(a) When treated with iodinated Zinc Chloride solution, the fibres become violet.

(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.

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. **3.Surface active substances:** Shake 10 ml of the solution 30 times vigorously in 10 seconds; allow it to stand for 1 min after 5 minutes. The height of froth should not exceed 2 mm above the surface of liquid. **4. Sinking time:** Pack 5 gm of Absorbent cotton loosely in the basket and drop it at the height of 10 mm on the surface of water, contained in a beaker. Should not be more than 10 seconds. **5. Water holding capacity:** Not less than 23 per gram. **6. Neps:** Spread thin layer 5 g of Absorbent cotton for an area of 450 sq cm .uniformly between two glass plate and view by naked eye under transmitted light. Should not be more than 500 neps/gm of absorbent cotton. **7. Water soluble substances:** Not more than 0. 5 % **8. Ether soluble substances:** Not more than 0. 5 % **9. Sulphated ash**: Not more than 0. 5 % **10. Loss on drying:** To check % w/w of volatile & moisture substances. Not more than 8.0 % w/w **11. Fluorescence Test-** A 5 mm thickness layer examine under 365 nm UV. lamp. It shows only a slight brownish violet fluorescence & few yellow particles. Not more than few fibers show an intense blue fluorescence.	
6		**Solve any FOUR questions (4 marks each)**	**16M**
6	**a)**	**What are the steps involved in general treatment of poisoning? Explain.** **The general steps involved in treatment of poisoning are:** 1. Removal of unabsorbed poison 2. Use of antidote 3. To remove absorbed poison 4. Supportive care	**4M**

5. Treatment of general symptoms

1.Removal of unabsorbed poison:

A)Ingested Poison

Gastrointestinal Decontamination

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

B) Contact Poison

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

C)Injected Poison:It is removed by making incisions at certain place causing bleeding

2.Use of Antidote:

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

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

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

3.To excrete absorbed poison

After 6 hrs. of ingestion of poison ,emesis and gastric lavage is useless .The poison has entered the intestine and hence the following measures should be taken

Forced diuresis : use I.V Chlorthiazide / mannitol

Use of cathartics

		Use of hot packs :-For increased sweating Peritoneal dialysis : for salicylate poisoning in children Hemodialysis:-For excretion of barbiturates, salicylates, thiocyanates, bromides. **4. Supportive care**: In poisoning there is possibility of upper respiratory tract infection, to avoid this prophylactic administration of antibiotics is given. Stabilisation of vital centres like cardiac, vasomotor and respiratory centre. Good nursing care is required to maintain general condition of victim. **5.Treatment of general symptoms**: When poison is unknown the treatment is given according to symptoms. **Symptoms** — **Treatment** Pain — Morphine Dehydration — ORS saline Respiratory Failure — Oxygen therapy Cardiac depression — Cardiotonics	
6	**b)**	**Explain teratogenicity and Idiosyncrasy. (2 marks for each explanation)** **Idiosyncrasy-** The term idiosyncrasy is used to denote abnormal drug response. Idiosyncrasy covers unusual, bizarre or unexpected drug effects which cannot be explained or predicted in individual recipients. It also includes drug induced foetal abnormalities, e.g. phocomelia which developed in the offsprings of mothers exposed to thalidomide.	**4M**

Cancer of Organ	Causative drug
Vaginal adenocarcinoma	High doses of stilbestrol during pregnancy
Kidney pelvis	Analgesic induced nephropathy
Uterus	Oestrogens (long term)
Lymphoid tissue	Azathioprine ,cyclophosphamide

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 deviations or abnormalities in the development of embryo that are compatible with pre-natal life and are observable post-natally are called teratogens and this phenomenon is called teratogenicity.

Examples of certain drugs that affect foetal development adversely are shown are-

Drug	Teratogenic effects
Thalidomide	Phocomelia, heart defects, gut atresia
Penicillamine	Loose skin
Corticosteroids	Cleft palate and congenital cataract-rare
Estrogens, diethylstilbesterol	Vaginal adenosis /cervical cancer in female foetus or structural abnormalities in the genitourinary tract in male offspring etc.

6	**c)**	**Define DIB. Give qualifications and abilities required for running DIC.** **(definition- 1 mark, any 6 qualifications and abilities, 3 marks)** **Drug Information Bulletin**: The Drug Information Centre may publish a journal or periodical or any booklet about current or amendment information on drugs, Various technical aspects and modernization of hospital practices for all the health professional which is referred as "Drug information Bulletin"	**4M**

		Qualifications and Abilities: 1. He must be able to critically evaluate drug literature. 2. He has an ability to edit the information. 3. He should be aware of sources of information for drug literature. 4. He must have good communication skills. 5. Familiarity with electronic data processing for information retrieval. 6. He should be a member of PTC. 7. Participation directly and indirectly in patient care by monitoring drug regimen. 8. He should have knowledge of research methodology. 9. Contributing to clinical pharmacy practices and education of its practitioners.	
6	**d)**	**Explain the factors influencing make or buy decision in hospital. What are the different methods of estimation of demand? (2 marks for factors influencing make or buy decision, 2 marks for methods of estimation of demand)** Following factors affect make or buy decision in hospital manufacturing: 1. Quality 2.Quantity 3.Cost and 4.Service. **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 a crucial factor. If a better quality results from in-house manufacturing, the matter should be probed further. **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 and EOQ give the hospital the quantity of production.	**4M**

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. Cost and quantity together considered for making the decision.

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 services of the hospital. Unfair practices of outsider make a hospital opt for making rather than buying.

There are three methods of estimation of demand-

1) **Judgmental Method-**

This is a method which depends upon the judgment of clinical and pharmacy staff where they express an opinion based on experiences about name and quantity of product that will be required majorly in the hospital.

2) **Experience of Past -**

The experience and reviewing records of consumption of drugs in the past helps in deciding the requirement of drugs in future.

3) **Causal Method-**

In this method by assessing medical record of the hospital one can estimate the demand for specific drug based on specific criteria.

e.g. - i) Antibiotic drugs –No of patients admitted every month for whom the specific antibiotic is used.

ii) Insulin- No of diabetic patients admitted in the hospital.

iii) Demand of whole blood- Is estimated on the basis of no of patients admitted in emergency wards.

6	e)	**Define Hospital formulary? Write the guiding principles while using Hospital Formulary.** **(1 mark for Definition, 3 marks for guiding principles- any 6 points)** **Hospital formulary-** Hospital formulary is revised compilation of pharmaceutical preparations and ancillary drugs which reflects current clinical judgment of medical staff of the hospital. **Guiding principles for preparation of Hospital Formulary: (any 6 points)** The following principles will serve as guide to all those utilizing the formulary system: 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. Generic equivalent- The drugs containing identical active compounds. .E.g Two brands of tetracycline. Therapeutic equivalent- The drugs differing in composition but having very similar pharmacological or therapeutic effects. E.g: two different antacid products. 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	**4M**

		changes in those preparations. Copies of formulary must be readily available at all times. 7. Provision shall be made for the use of drugs not included in the formulary, by the medical staff. 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	
6	**f)**	**What are the objectives of hospital pharmacy?(any 8 objectives – ½ mark each)** 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.	**4M**