



WINTER-15 EXAMINATION

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Important Instructions to examiners:

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



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Q. No 01 - Attempt any TEN. (Each question will carry TWO marks)

a) Define Hospital and Floor stock. (01 Mark for each definition)

Ans:-

1) Hospital-The hospital is complex organization utilizing specialized scientific equipment and functioning through a group of trained people educated to the problems of modern medical sciences. All these are co-ordinate together for the common purpose of restoration and maintenance of good health.

2) Floor stock- The stock of the drugs (charge and non charge) which is stored at Wards & Nursing units under the supervision of nursing in charge is called as Floor stock.

b) Write four types of Forceps. (1/2 Mark for each name)

Ans- I) Toothed tissue forcep-

- i) Allis type.
- ii) Lanes type.
- iii) Moynihans tetra forceps.

II) Non toothed tissue forcep-

- i) Bobcocks tissue forceps.

III) Haemostatic or Artery forcep-

- i) Ordinary artery forcep.
- ii) Mosquito type Haemostatic forceps.

IV) Dissecting forceps-

- i) Plain dissecting forceps.
- ii) Toothed type dissecting forceps.

c) Define (any two) – (1 mark each)

i) Drug Abuse- Drug abuse is defined as ‘the consumption of a drug apart from medical need or in unnecessary quantities.’

OR

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



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

iii) Antidote- These are the drugs which reverse, stop or counteract the effect of poison.

d) Explain (any two) (1 mark each)

i)Bio-equivalence: If two or more similar dosage form of same drug reaches to the blood circulation at the same relative extent and to the same relative rate, these are bioequivalence.

ii) Hallucinogen – It is a drug that acts on CNS to produce a state of perception of object with no reality or of sensation with no external cause.

iii) Lithotripsy- It is the technique used to disintegrate the urinary stone by laser beam.

e) Write one example of corrosive and mechanical poison. (For each example 01 Mark)

Corrosive-

Sulphuric acid, nitric acid, hydrochloric acid, oxalic acid, Sodium hydroxide, Potassium hydroxide, carbonates of sodium, calcium, potassium, caustic soda ,caustic potash.

Mechanical poison-

Powdered glass, chalked, hairs Sponge, Diamond dust.

f) Write about Anaphylaxis or Idiosyncrasy. (02 Marks)

Ans-

i) Anaphylaxis- It is the most serious type of drug allergic reactions. It is state of shock that produced by antigen antibody reaction in the cell each causes release of substance that acting on vascular system It is generally due to the immunoglobulin E . Anaphylactic reactions are shown by Penicillin, anesthetics, dextran, iodine containing compound, Allergy response may be generalized or localized. Generalized anaphylaxis is characterized by bronchospasm, circulatory collapse with hypotention and sometimes skin rash. If it is localized to gut, shows abdominal pain.

OR

i) Idiosyncrasy - It means unusual, bizarre or unexpected drug effects which cannot be explained or predicted in an individual recipient. It includes genetically determined abnormal



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responses to a drug. It has been used to denote both qualitatively & quantitatively abnormal drug responses. The characteristics of Idiosyncrasy are-

- i) Occurs in genetically abnormal persons.
- ii) Response is dose dependant.
- iii) Idiosyncrasy mechanism is explained on the basis of drug receptor interaction.

g) Write result of Drug Interaction- (Any two) (1 mark each)

Drug Interaction	Result
i) Warfarin along with salicylates	Hemorrhage
ii) Rifampicin along with oral contraceptive	Pregnancy
iii) Alcohol with CNS depressant	Increased CNS depression
iv) Digitalis glycosides along with antacids	Decreased cardiotoxic effect

h) What advice should be given to patient who takes: (Any two) (1 mark each)

- i) Antidiabetic drug-** ‘Avoid alcoholic beverages while on drug therapy’.
- ii) Ampicillin-**
 - i) ‘May cause diarrhea’.
 - ii) It should be taken on empty stomach i.e-1hour before or 2 hours after meal.
 - iii) Complete the course otherwise reoccurrence may be occur
- iii) Tetracycline-** ‘ Do not take with milk or antacid’
- iv) Diazepam-** ‘This drug may cause drowsiness so do not work with dangerous machinery and do not drive vehicle’.



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i) Write normal values and significance of (Any two) (For values ½ mark & for significance ½ mark)

Ans-i) Haemoglobin- Normal values-

- **Male - 15.5+ or- 2.5 gm%**
- **Female - 14+ or – 2.5 gm%**
- **Infants - Upto 18 gm %**

Significance- Values below normal indicates anaemia and leukemia and values above normal level indicates dehydration & polycythemia vera.

ii) Blood pressure-

Normal value- 80-120mm of Hg.

Significance-

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

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

iii) W.B.C-

Normal value-4000-11,000cells / mm³

Significance -Count below normal level is present in case of influenza, measles, typhoid, hepatitis, dengue & rheumatoid arthritis. Count above normal level indicates bacterial infection, leukemia, pneumonia, tonsillitis, small pox. It may also increase in menstruation, pregnancy & in fear.



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iv) Blood sugar- Normal value- 80 -120mg/100ml of blood

Significance-a) Increase in blood sugar indicates diabetes mellitus, acute stress, hyperthyroidism, chronic liver disease, Cushing's disease, adrenal cortical hyperactivity ,severe nephritis.

Decrease in blood sugar indicates Addison's disease, hypothyroidism, hyperinsulinemia, adrenal cortical hypoactivity, Chronic alcoholism.

j) Translate into English- (Any Four) (1/2 Mark each).

Ans- i) Cataplastm - A Poultice

ii) Collyr - An Eye lotion

iii) Garg -A Gargle

iv) Ung - An Ointment

v) Unus - One

vi) Tussis – A Cough

k) Write names of four quality control tests performed on parental or tablets.

(For each test ½ Mark)

Ans- Quality control tests performed on parental:-

- Sterility test.
- Pyrogen test.
- Clarity test.
- Leaker test.



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OR

Quality control tests performed on Tablets:-

- Hardness test.
- Disintegration test.
- Dissolution test.
- Friability test.

1) What is meaning of following- (Any four) (½ Mark for each meaning).

Ans- i) I.C.U - Intensive Care Unit.

ii) C.C.F - Congestive Cardiac Failure.

iii) K.U.B - Kidney Ureter Bladder X-ray.

iv) B.B.B - Blood Brain Barrier.

v) H.R.T - Hormone Replacement Therapy.

vi) U.T.I - Urinary tract infection.

Q. No 02 - Attempt any THREE. (Each question will carry FOUR marks)

12

a) Define and write functions of Hospital Pharmacy.(For definition 01 mark & 03 marks for any six functions)

Definition-Is defined as the practice of pharmacy in hospital. It is the department in hospital in which the drugs are dispensed, manufactured, compounded ,distributed, preserved, purchased, stored, assayed, packaged to inpatients and outpatients by legally qualified and professionally competent pharmacist.



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Functions-

- Dispensing of drugs, chemicals and pharmaceutical supplies.
- Dispensing of all narcotic drugs, alcohol & maintaining running stock account of the same.
- Filling and labeling of all drug containers.
- Inspection of all pharmaceutical supplies.
- To maintain satisfactory system of record and book keeping of all products available in hospital pharmacy.
- Maintaining stock of approved drugs.
- To maintain adequate control over dispensing of all drugs.
- Maintaining correct specification of drugs.
- To maintain correct costing of drug.
- To prepare large volume parenteral & other parenteral preparations & to maintain aseptic condition while manufacturing.
- To check quality of manufactured product.
- To give information concerning to medicine to physician, interns & nurses.
- To prepare periodical & annual report about working of Hospital pharmacy.
- To implement decisions of PTC.
- To implement programme of education for pharmacist, nurses and interns.

b) Describe functions of Hospital administrator. (04 Marks for any eight functions).

Ans-

1. Implementing the policies, procedure & guidelines frame by GB in the daily management of hospital laid down by GB.
- 2) Attend meeting of GB as well as medical staff & paramedical staffs (Head of various department).
- 3) Incharge of admission & discharge of the patient.
- 4) Link between GB & medical staff. Also link between GB & all other employees.



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- 5) Prepare a hospital budget for approval by the GB.
- 6) Oversees the training of the students, nurses , volunteer etc.
- 7) Ensure smooth functioning of the OPD.
- 8) Provide facilities, equipment, & assistance so that improve quality of patient care.
- 9) He has power of staffing & directing in consultation with the dept. of heads.
- 10) Modify internal organization of hospital in response to current operating condition

c) Write purpose, principles and contents of medical record.(purpose-02Marks, principle-01 Mark,contents-01 Mark)

Ans- 1) Purpose-

- To serve as a basis for planning & for continuity of patients care.
- It assists in protecting legal interest of the patient hospital & physician.
- It helps for communication among the physician & any professional contributing to the patients care.
- It acts as a evidence for the patients illness & treatment during each hospital stay.
- It provides data for use in research and education.
- It serves as a basis for review study of the patient & evaluation of health care given to the patient.

2) Principle-

- It must be accurately prepared.
- It must be properly stored & readily available.
- It must be easily accessible.

3) Contents- It must contain all important clinical information which should give immediate knowledge to another physician who takes care of patient at any time in emergency complete medical record is one which contain personal family history,history of patients present illness The physical examination,clinical laboratory data,X-ray and other examinations,medical and surgical treatment,pathological findingsof patient progress notes,final diagnosis,condition on discharge,regular follow up of the patient.If the death of patient has occur the medical record also contains autopsy findings.



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d) Classify hospitals on the basis of ownership.

On the basis of ownership hospital is classified as-

I.Public ownership:- such type of hospital run by Government

They can be

i)Central govt hospital like-

Railway Hospital, Defence Hospital, AIMS Hospital.

PG institute of medical sciences.

ii)State govt Hospital like-

Civil Hospital and district head quarter.

J.J Hospital Mumbai.

iii)Local self government Hospital

These are run by municipalities or corporation.

BMC Hosp like Bhagwati Hospital ,KM hospital Parel Mumbai.

II. Private ownership-

i)They can be run by trust. The board of trustees managed the Hospital affairs

Bombay Hospital mumbai, Jaslok Hospital.

ii)Religious bodies and other-

Ramakrishna Hospital Calcutta and

Christian medical college hospital (Bangalore).

iii)Limited company hospital- They can be incorporated as public Ltd company where public subscribes to the share capital.

Apolo Hospital Ltd (Madras).

Medinova (Baroda).

iv) Private hospital or nursing home – Run by single or group of private practitioner or husband wife team.They are proprietary or partnership concern and general nursing home.

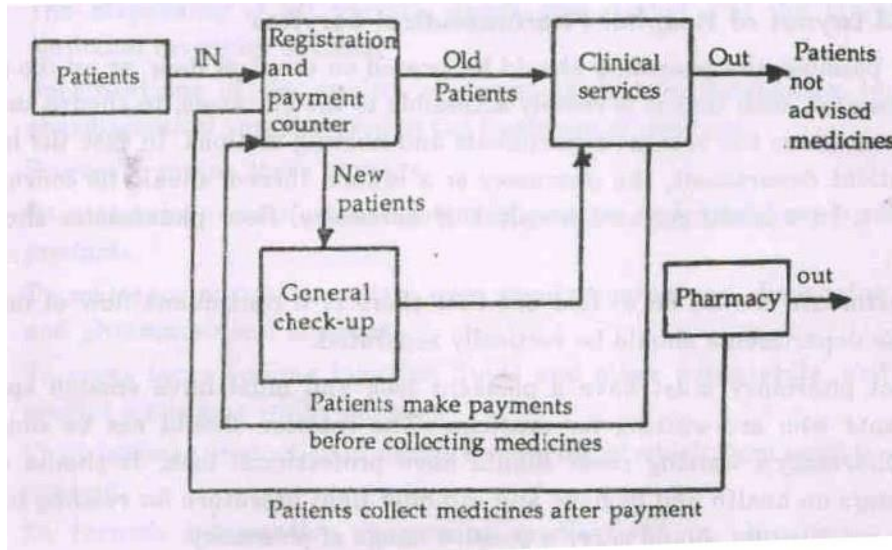
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e) Draw and describe flow chart of patients in Hospital.(02 Marks for flow chart & 02 Marks for description.)



1. The first step is registration where new and old patient is registered and get case papers after paying nominal fees. Where old patient directly go to their respective clinical service department without going to general check up counter. The old patient may be hospitalized on doctors advice or patient may be out without admitting the hospital and not prescribe medicine and out.
2. Where new patient goes to general check up counter –guided for medical department on the basis of clinical symptom .
3. Physician write prescription for patient then patient return to the payment counter to make the payment of hospital charges. The clerk enters the silent feature on the history sheet collect the money and stamp the prescription
- 4) Patient submitted stamp prescription to the pharmacy department.
- 5) Pharmacy make duplicate bill and give to the patient for deposition of money for medicine. After showing the paid bill patient collect the medicine against prescription.

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Q.3. Attempt any THREE (Each carries 4 Marks)

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a) Describe location and layout of Outpatient Dispensary.(Location- 1 mark, layout carries 3 marks)

Location-

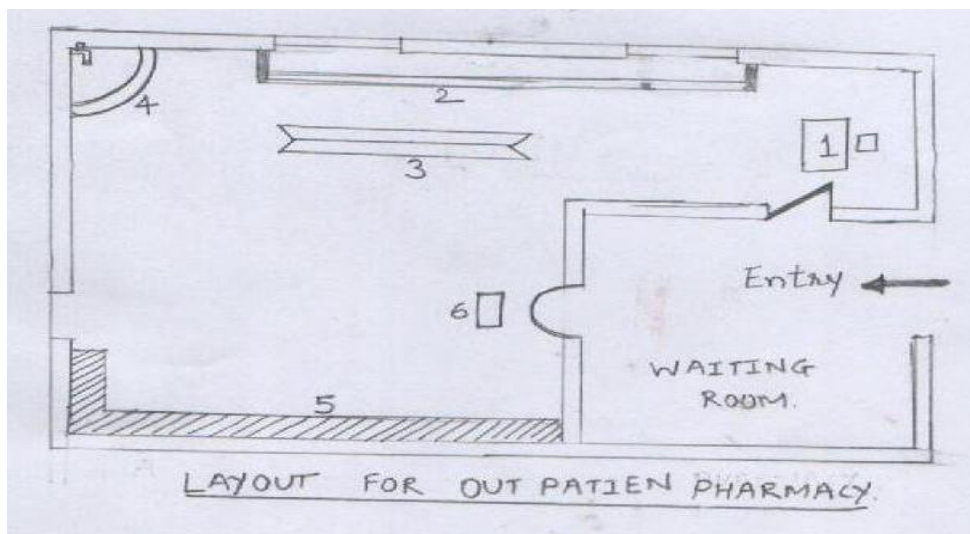
It should be located near main entrance of the office and the hospital and minimum disturbances to inpatient unit. It must be located on ground floor

For location of this service three provisions are made

- 1) A separate outpatient dispensing pharmacy is set up.
- 2) A combined unit service for in-patients and outpatients from same window
- 3) A combined unit service for inpatients and outpatients from different windows.

When the outpatient department and pharmacy are geographically widely separated, a separate outpatient dispensing pharmacy is set up.

Layout-





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1. Table and chair, 2.Preparation table, 3.Storage rack, 4. Sink with tap,

5. Medicine platform 6.Dispensing window

1) The layout of this unit is important since it carries the good or bad impression about the hospital depending on the services the outpatient gets.

2) The unit should be provided with two windows, one for receiving the prescription and other for delivery.

3) When the prescription is being compounded, the patients have to wait for some time. Hence waiting area should be provided.

4) The waiting room should be clean and ventilated with sufficient no. of comfortable seats.

5) In the waiting room, general publications regarding pharmacy and medicines should be provided. It also includes magazines and news papers

6) The waiting period should be kept minimum to avoid overcrowding.

7) In the waiting room the wall posters should be displayed through which patients can learn about the family planning methods and general hygiene.

8) Thus the waiting room of the outpatient dispensing unit should be good place for educating the patients on matters relating to the health and hygiene.`

9) There should be consulting room and store room.

b) How pre- packaging is carried out? What are its benefits? (Method carries 2 ½ marks, Benefits carries 1 ½ marks)

Method

1) Pre packaging is eminently suitable for fastest moving items whose consumption is very quick and also for those items which take a long time for compounding and packing.



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- 2) It should give consideration to the factors like demand and turnover of the item, the container to be used, the labeling to be done, the process of packing itself, the stability and cost of prepacking
- 3) Size of the package is the result of consultation with the pharmacy as well as nursing staff of the hospital.
- 4) The data for various dosage forms and therapeutic categories is the guiding factor to determine the pack size.
- 5) Hospital formularies may give definite guidelines of the quantities to be prescribed for certain categories of the drugs
- 6) In OPD of many hospitals, the call cycle of the patients determines the quantity of the drug supplied at each call. The quantity must be adequate to last between the two calls of the patient.
- 7) Pre- packaging operation is carried out either by a pharmacist or other persons at the pharmacy under his direct supervision.

Benefits:

- 1) It offers convenience, labour saving and time saving
- 2) Pre- packaging is useful for IPD as well as OPD and is most useful during lean hours when there is hardly any skilled staff available.
- 3) No medication error in prepackaging as it is carried out under observation of pharmacy services.



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c) What are charge floor –stock drugs? What are the methods to dispense the drugs?

(Definition- 1 Mark, Method- 3 Marks)

Definition- Means those drugs which are stocked on the nursing station at all the times and are charged to the patients account after their administration to the patient.

Dispensing of charge floor stock drugs (Envelope method)

The patients are charged mostly because of high cost of the drugs. These include injections or other single dose preparations. An envelope is used to dispense the drug to the nursing station which is used as charge ticket. The pre- labelled envelopes are filled with specific drugs in specified quantity and placed at the disposal of nursing unit. When the drug is administered, the patients name and room number is entered on the envelope and sent to the pharmacy where it is priced & forwarded to account department for billing.

D) What are Central services? Write three different administrative patterns of Central services.(Definition- 1Mark, Administrative patterns-3 Marks, 1Mark each)

Central services is alternatively called central supply department which provides essential supplies and equipment. both sterile and non sterile –to all specialized departments.

There are three different patterns of the administrative structure of the central service departments.ss

1) Dept. under PHARMACY control:

a) Well trained & qualified pharmacist handle various function- Procure, storage & distribution of medical supplies. b) Operate & maintain different sterilizer. c) Ability of Mfg. various parenteral preparation aseptically.



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2) Dept. under NURSING control:

a) Senior nurse is in charge of this department. b) Nursing in charge handle various functions like-Cleaning, packaging, & distribution of medical supplies & equipment & majority of items supplied by CSS are used by nurses for their patients & they are familiar with these items.

3) Dept. under dual control of PHARMACY & NURSING: Dual function-

1) Procure, storage, & distribution of medical supplies b) Operate & maintain different sterilizer
c) Ability of Mfg. various parenteral preparation aseptically under pharmacy control 2) Cleaning, packaging, & distribution of medical supplies & equipment under nursing control.

e) Explain how purchase order is prepared and distributed.(Preparation of Purchase order -1Mark, Distribution- 3Marks)

After the receipt of purchase requisition, the purchase officer/ pharmacist prepares a detailed purchase order in a printed form. The items are systematically ordered by spelling out the specifications, prices and quantities. The basis for making purchase order is purchase requisition.

Several copies of purchase order can be prepared

- 1) a copy for the supplier
- 2) a copy for the account section
- 3) a copy for the purchase section
- 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 sent,
- 6) a copy for filing to the purchase section , to ascertain the rates and other information in future.

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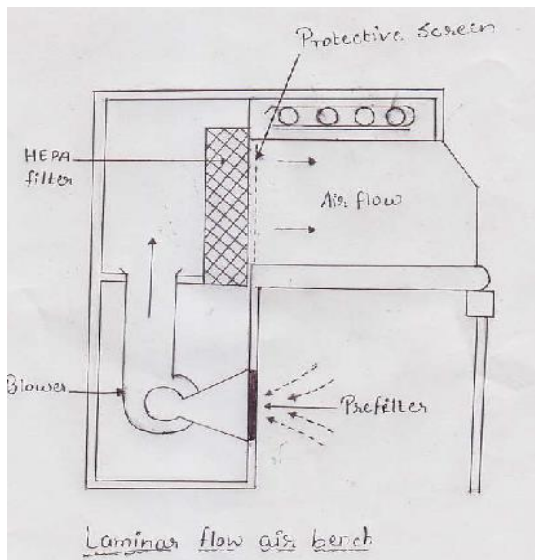
Q.4. Attempt any THREE (Each carries 4 Mark)

12M

a) What is Laminar flow? Write about Laminar flow bench with diagram.

(Definition- 1Mark, Diagram- 1Mark, Description- 2Marks)

Definition-It provide unidirectional flow of air, which sweeps away dust, dirt , fibers, microorganism & give clean air moving with uniform velocity along with parallel line.



It contain HEPA filters– Which filter air & remove particles up to 0.3 micron with an efficiency of 99.97%.

It is used to carry out sterility testing, filling process & microbiological testing like bio-assay.

Two type of air flow--A) HORIZONTAL AIR FLOW.

B) VERTICAL FLOW.

A) HORIZONTAL AIR FLOW— Use for filling of parenterals.

B) VERTICAL AIR FLOW—Use for sterility testing procedure.

It provides positive pressure. Ultraviolet lamp on work bench.

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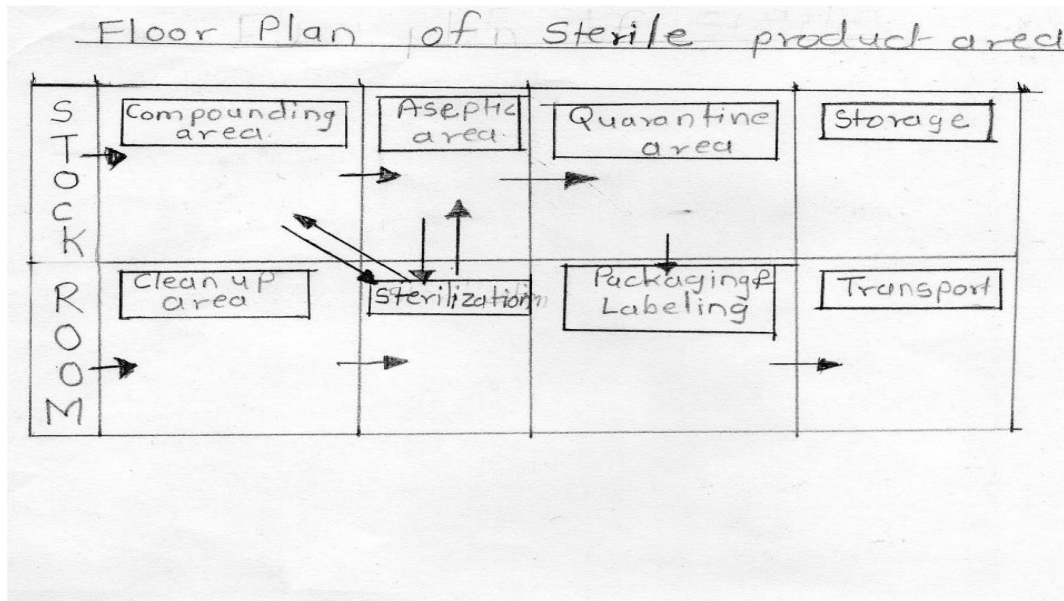
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b) Describe layout of sterile products area with diagram.

(1Mark- Diagram, 3Marks- Description)



1) Clean -up area:

This area should withstand the the effects of moisture, steam and detergents. The ceiling, floor and walls of this area should be constructed such that moisture will run off. For this purpose use of vinyl or epoxy sealing coat for finishing avoids the holes in these surfaces. The area should be washed at regular intervals and properly exhausted. The area must be cleanable and precautions must be taken to prevent the growth of microorganisms and collection of dust.

2) Compounding area:

It is also called as preparation area since the formula is compounded here. Although this area is not necessarily aseptic, a strict control over it than clean-up area is required . The means should be provided to control dust. The ceilings, walls and floors should be constructed similar to clean up area. The cabinets and counters should be of stainless steel and these should be fitted in such a way that these should not catch dust.



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3) Aseptic area:

Air in aseptic area should be free from fibres,dust nad microbes.Such clean/sterile air can be achieved by using HEPA filter which are placed in laminar air flow bench/hood.

This area must be sealed so that it may be washed and sanitized with a disinfectant. All electricity, ventilation and utility services fitting should be in the walls or ceiluings to eliminate the joints for the accumulaton of dust and dirt. The mechanical equipment to be placed in this area should be kept within stainless steel cabinet.UV rays is used to reduce microbes on the surface and wall.Routine environmental control test are conducted.The entry of personnel in aseptic area should be through air lock system.

4) Quarantine area

This area should be under the supervision of responsible persons, because “in process batches” are kept in locked lockers. Approved batches from QC department can kept here before labelling and packing. It must contain space separates ‘Approved batches and ‘In process batches’. This area is only restricted to a responsible person.

5) Labelling and packing area.

Adequate space is required for installation of printing devices and packaging machines.In this area,label printing and labelling can take place

c) Write composition and functions of PTC. What is the role of PTC in ADR?

Composition- 1Mark, Any 4 Functions- 2Marks, Role of PTC- 1 Mark)

Composition:

The pharmacy and therapeutic committee is composed of representatives from all walks of health care system.It includes

3 Physician, 1 Pharmacist,1 Nurse, 1 Administrator.



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Functions:

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

Role of PTC in ADR

- 1) Physician notifying ADR to allergist, dermatologist etc.
- 2) Attending physician complete ADR report form.
- 3) ADR report form forwarded to clinical pharmacologist or PTC.
- 4) ADR should listed in medical record as a diagnosis whenever such applies.
- 5) PTC interact with bodies like FDA & FDA gather information on drug effect & its ADR.



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d) What is Hospital formulary? What are the contents of the Hospital formulary?

(Definition- 1 Mark, Contents- 3Marks)

Hospital formulary- It is a continually revised compilation of pharmaceutical dosage form available in the hospital & which reflect current clinical judgment of medical staffs. HF is prepared by PTC.

OR

It is a book containing list of pharmaceutical preparation available in the hospital for patient care.

Contents of the Formulary:

1)Information of drug product: Include list of branded & generic drugs

With their formulation, dosage strength, route of administration, cost information etc.

2) Index to drug product listing: a) For branded & generic drugs index- Proper reference to page number in each entry. b) Therapeutic/ Pharmacological index—According to Therapeutic category.

3) Name & titles of members of PTC.

4) Details of hospital policies & procedure regarding drug use, & request for entry of new drug in formulary.

5) List of approved product used in hospital.

6) Prescription writing-important section for young physicians.

7) Appendix: a) Normogram of Body weight, height, BP. b) Posological table. c) List of items from CSS d) List of poisons & their antidotes e) List of emergency drugs f) Tables of DI. g) ADR report. h) Pharmacokinetic dosing & monitoring information. i) Metric conversion scales & tables.



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e) What qualities should be required for the pharmacist to run Drug Information centre?

(Any 8 qualities, ½ mark each)

Qualities/ Qualification required for running Drug Information centre

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.

5. Attempt any THREE (4 marks each)

12

a) Mention four categories of surgical dressings and mention two tests to evaluate absorbent cotton.(2- mark for 4 categories,2 marks for any two tests)

(Example of categories may be consider)

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):



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Zinc oxide adhesive plaster, capsicum plaster, Belladonna plaster.

Tests for evaluation of Absorbent cotton IP – (any 2 test)

1. Fibre Length: not less than 6.25mm in length and more than 12.5 mm in length.
2. Alkalinity or Acidity: No pink colour develops in acidity and alkalinity test
3. Surface active substances: froth should not exceed 2 mm above the surface of liquid
4. Sinking time : Should not be more than 10 seconds.
5. Water holding capacity: Not less than 23gram of water/gram of cotton.
6. Neps: 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. Loss on drying : : Not more than 8.0 % w/w
10. Residue on ignition : : Not more than 0.2% residue remain.

(b) How computers are useful to maintain records in hospital?

Maintenance of records: Computer can store data i.e records .In pharmacy various records like patient information, his medication history, current treatment and financial records are store. It includes patient 's name, age ,sex ,room number, allergies diagnosis and special precautions .The computer can store all information in the files like physician's name, Direction ,drug interaction etc.

- 1) Patients name file- It contains patients name, phone no.,address of the patient, allergies, Registration no. , sex, any special information etc. the complete computerused patient registration record is available to each clinic dealing with patient from single database.



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- 2) Physician Name file- It stores the name and address of the physician ,Telephone no, physician code according to their specialist.
- 3) Drug reference file- It stores the drug name, their strength, their therapeutic dose, instruction for prescription, label etc.
- 4) Direction file- It contain the code for direction and their English translation E.g: SOS,tid, bid
- 5) Drug interaction File- This file store code for interacting drug pair, type of drug interaction ,reference regarding interactions. Thus, computers store and make the information available wherever necessary..

(c) Write sources of drug information.

1.Primary sources – (1 mark)

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

2.Secondary sources – (2 marks)

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

- i) Journals and periodicals – American journal of hospitals pharmacy, Indian journal of hospitals pharmacy, Journal of clinical pharmacology.
- ii) Text books – Text book of hospitals pharmacy, clinical toxicology.
- iii) Reference books- Remingtons pharmaceutical science, Merk index
- iv) Pharmacopoeias – The Indian Pharmacopoeia, British Pharmacopoeia
- v) Formularies – National formulary of Indian, National formulary of America.



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3) Tertiary Sources - (1 mark)

It include dictionaries, encyclopedias, desk references

The Chemist and Druggist directory

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

Medical register and Directory of Pharmaceutical Chemists.

-Statistical Table and Mathematical table to provide scientific data.

(d) Define Clinical Pharmacy. Write functions of clinical pharmacist. (definition -1 mark, any 6 functions -3 marks)

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.

Role of clinical pharmacist (any 6)

1. Prepare medication histories for patient's permanent medical record.
2. Helps in selecting and monitoring of drug therapy- Deciding the dose and dosage schedule by using pharmacokinetic consideration of the drug and patient disease status, is monitoring drug therapy.
3. Arranging educational and training programmed- Arranging seminars on drug use, review and patient care programme.



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- 4.They provide consultation regarding IV therapy,TPN,clinical pharmacokinetics selection of drug therapy.
5. Clinical pharmacist is involved in Drug administration and drug distributionin patient care area.
6. Establishes and monitor a system to insure proper storage of pharmacy items such as insulin and other biological products.
7. Detects and diagnoses adverse drug reactions and drug interactions
8. Participating in emergency situations of patients e.g. drug overdose, toxic reactions in the body,poisoning ,providing first aid treatment.
9. Participation in clinical investigation-It involve clinical drug trial on animal .He participate in such activity with physician investigator

(e) Describe procurement or purchase procedure step by step.

In hospital following procedure for procurement of materials is followed:

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

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

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



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

Purchase order form consists of many pages 'snap out' -

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

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

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

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

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

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

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

5. Release of payment to supplier.



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6. Attempt any THREE: (4 marks each)

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(a) What is patient compliance? Which instructions should be given by pharmacist to patient to improve compliance?(1 mark patient compliance, any 3 instructions-3 marks,1 mark each)

Patient compliance means the patient is following the directions for use of prescribed drugs. With the use of various techniques of communication (verbal, written or audio- visual) the pharmacist should inform, educate and counsel patients about the following items for each drug

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

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

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

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

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



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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 product, as the pharmacist. Hence, the pharmacist should demonstrate the method of removal of drug from the package to the patient so that he can handle it properly.

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

(b) Define and classify Adverse Drug Reaction.(Definition -1 mark, classification -3 marks)

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

1.Predictable ADRs:

1.Excessive Pharmacological effect

2.Secondary Pharmacological Effects, 3.Rebound response on discontinuation



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

(c) Define Teratogen. Describe Teratogenicity. (Definition – 1 mark, Description – 3 marks)

Drugs or other factors producing deviation or abnormalities in the development of embryo, that are compatible with pre-natal life and observable post-natally are called teratogens.

Teratogenicity: The term teratogenicity is originally derived from Latin teratos, meaning 'monster'. 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.

True teratogens cause abnormalities in doses lower than are necessary to cause toxic effect on mother or foetus. It is most harmful if the foetus is exposed to the drug during first ten to twelve weeks of gestation. Foetus is more susceptible to drugs than the mother, as foetal hepatic enzymes function is minimum and rapidly growing foetal tissues are more susceptible to the drug effect.

Examples of certain drugs that affect foetal development adversely are shown in table below:
Thalidomide causes Phocomelia, heart defects, gut atresia, Penicillamine causes Loose skin, Corticosteroids causes Cleft palate and congenital cataract-rare, Estrogens, diethylstilbesterol causes Vaginal adenosis /cervical cancer in female foetus or structural abnormalities in the genitourinary tract in male offspring etc.

(d) Define Bioavailability. Write factors affecting Bioavailability. Discuss physical factors which affect it. (Definition- 1 mark, Factors – 1 mark, Physical factors – 2 marks)

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

OR



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

OR

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

Factors Affecting Bioavailability:-

1) Physical properties of drug:-

- a) pKa
- 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) Disease state

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

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

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

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



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

Particle size : Smaller particle size provides greater surface area of drug thus improving its absorption. Small particle size is useful in absorption of corticosteroids and antibiotics like chloramphenicol, griseofulvin and oral anticoagulants

(e) Write pathophysiology, signs and symptoms and complications of diabetes or arthritis.

Diabetes: Diabetes is a chronic health condition in which the body either fails to produce sufficient amount of insulin or responds abnormally to insulin.

Pathophysiology (2marks)

In a diabetic person, due to abnormal insulin metabolism, the body cells and tissues do not make use of glucose from the blood, resulting in an elevated level of blood glucose, hyperglycemia. Over a period of time, hyperglycemia 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 metabolise free fatty acid into ketone bodies that results in keto acidosis.

Sign and symptoms. (any 2 – 1 mark)

1. [polyuria](#) (frequent urination), [polydipsia](#) (increased thirst) and [polyphagia](#)
2. Hyperglycemia, 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.



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Complications (any 2 – 1 mark)

1. Retinopathy, 2. keto acidosis,3. Neuropathy, 4. Obesity, 5.Arteriosclerosis, 6. Cataracts
- 7.Infections

OR

Rheumatoid arthritis

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

Pathophysiology: (2 marks)

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.

Sign and symptoms.(2 marks)

Fatigue, anorexia, weight loss and fever

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



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