



SUMMER- 14 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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1. Answer any eight of the following (**Each question carries 2 marks**)

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a) Name the disease due to the following causative agents. (**1 mark each**)

1. *Bardetella pertusis*: Pertussis (or whooping cough)
2. *Yersina pestis*: Plague

b) Give diseases occurring due to deficiency of: (**1 mark each**)

- 1) Vit. K: Slow blood clotting, haemorrhage
- 2) Folic acid: Anaemia

c) Define the term: (**1 mark each**)

i) Incubation period: Incubation period is the time between the entry of disease agent and appearance of symptoms.

ii) Health: is a state of complete physical, mental and social well being and not merely the absence of disease or infirmity.

d) Give one example of each: (**1 mark each**)

i) Airborne disease: (**Any one of the following**)

Diphtheria, pneumococcal pneumonia, pertussis, haemophilus meningitis, meningococcal meningitis, Chicken Pox (varicella), Herpes Zoster (Shingles), Measles (rubeola) German measles (rubella) Mump, Small Pox (Variola), tuberculosis

ii) Waterborne Infections Caused by Bacteria: (**Any one of the following**)

Microbial: Cholera, diarrhoea, Shigellosis (bacillary dysentery), viral hepatitis and poliomyelitis
Parasitic water borne diseases: worm infestations.

e) Write two advantages and two disadvantages of IUDs.

Advantages of IUDs: (**Any two of the following advantages, 1/2 mark for each advantage**)

1. Insertion does not require hospitalization and requires only few minutes
2. After insertion, stays in place as long as required
3. Contraceptive effect is reversible



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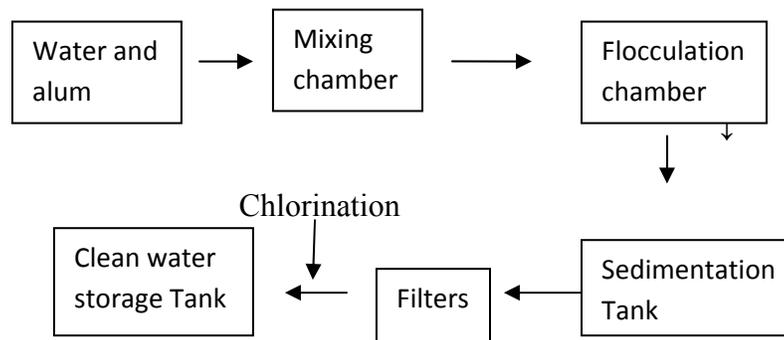
4. Failure rate negligible
5. Free from systemic side effects
6. Highest acceptability

Disadvantages: (1/2 mark per disadvantage)

1. Can produce heavy menstruation and pain
2. May be automatically expelled

f) Draw a flow diagram of “rapid sand filter”.

a) Diagram of “Rapid Sand Filtration”



Flow Diagram of Rapid Sand Filtration



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g) What do you know about “isolation of patient”?

Isolation: Infectious diseases have definite periods of communicability and if the patient can be isolated from the community within the period of communicability the spread can be reduced. Usually the patient is isolated in a hospital and spread of infection to other patients in the hospital is also prevented by appropriate measure. The isolated patient is kept in a room away from the general ward, only one nursing staff attends to the patient and visitors are not allowed. Whomsoever enters into the room of the patient uses apron; mask etc. and afterwards his hands are washed and disinfected. Isolation is very effective in the control of diseases like cholera, diphtheria and respiratory infections.

h) Give the disinfection procedure for 'Linen'.

Disinfection procedure for 'Linen': Bed sheets, and other linen articles soiled with infected materials are washed with soap and water or these are treated with a disinfectant (cresol 2-3%) then these are boiled for 20-30 minutes in water and if soap is added to water the disinfectant action is better. Wollen and thick articles cannot be disinfected by boiling so either they are autoclaved after washing or ionizing radiations are used for their disinfection.

i) What is meant by essential amino acids? Enlist different EAAs. **(1 mark**

for explaining the term and 1 mark for examples Minimum 4 examples)

Essential amino acids those amino acids which cannot be synthesized by the body and must be obtained from dietary proteins.

These EAAs are

1. Leucine
2. Isoleucine
3. Lysine
4. Methionone
5. Phenylalanine
6. Thronine
7. Valine
8. Tryptophan
9. Histidine



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j) Name one disease caused by the following arthropods: **(1 mark each)**

i) Housefly: **(Any one of the following)**

Typhoid, Paratyphoid fever, diarrhoea, dysentery, cholera, gastroenteritis, amoebiasis, helminthic infestation, poliomyelitis, conjunctivitis, trachoma, anthrax.

ii) Mosquito: **(Any one of the following)**

Malaria, filariasis, dengue (viral fevers), viral encephalitis

k) Give the long form of the following: **(1/2 mark each)**

1. ORS: Oral Rehydration Salt (Solution)
2. STD: Sexually Transmitted Diseases
3. BCG: Bacillus Calmette Guerin
4. TT: Tetanus Toxoid



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1) Compare the following: (**any 4 points can be considered for 2 marks i.e.1/2 mark for each point**)

“Active immunity and passive immunity.”

Active immunity	Passive immunity
1. Antigen containing preparations imparts active immunity.	1. Antibody containing preparations imparts passive immunity
2. Immunity develops slowly and lasts for a longer period.	2. Immunity develops quickly and lasts for a short period.
3. It is used for long term prophylaxis.	3. It is used for prophylaxis and also for curative purpose.
4. Produced actively by host's immune system.	4. Received passively by the host, no participation by host's immune system.
5. Induced by infection or by using immunological products .E.g. Vaccines.	5. Achieved by introducing readymade antibodies.
6. Immunological memory is present	6. Immunological memory is absent.
7. Not useful to immunodeficient hosts.	7. Useful to immunodeficient hosts.
8. No inheritance	8. May be acquired from mother.

2. Answer any four of the following (**3 marks each**)

a) What is disease agent? Classify them with examples. (**1 mark for definition**)

The disease agent is defined as a substance living or nonliving, or a force tangible or nontangible, the excessive presence or lack of which may initiate or perpetuate a disease process.



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Classification with examples: **(Any four classes with examples can be considered for 2 marks i.e.1/2 mark for each correct class with example)**

1. Biological Agents: The living agents like viruses, fungi, bacteria, protozoa, rickettsiae are the biological agents responsible for causation of disease.
2. Nutrient Agents: These can be proteins, fats, carbohydrates, vitamins, minerals and water. Excess or deficient intake of these leads to nutritional disorders like anemia, obesity, night blindness, beriberi, scurvy, dehydration, and edema. Etc.
3. Physical Agents: Exposure to excessive heat, cold, humidity, pressure, radiation, electricity, sound results in illness.
4. Chemical Agents: Certain chemical substances produced in excess by the body because of derangement of metabolic functions lead to diseases. These are the Endogenous agents causing the disease.

Eg. Excess of bilirubin leads to Jaundice.
 - a. Excess of uric acid leads to Gout.
 - b. Excess of calcium carbonate forms kidney stones.
5. Exogenous agents are acquired by the body from the environment by inhalation, ingestion or inoculation; cause various acute or chronic diseases. Various exogenous chemical agents are allergens, metals, fumes, dusts, insecticides etc.
6. Mechanical Agents: Exposure to frequent or chronic friction and other mechanical forces result in tearing, sprains, dislocation etc.
7. Social Agents: Poverty, smoking, drug abuse, unhealthy life styles, social isolation and maternal deprivation can act as causative factors for the development of disease.



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b) What is diabetes mellitus? Give causes and preventive measures of diabetes mellitus. **(1 mark for definition)**

Diabetes mellitus is a disease characterized by chronic hyperglycemia leading to a number of complications e.g. cardiovascular, renal, neurological, ocular and other such as recurrent infection. The basic cause is absolute or relative deficiency of insulin or inability of the body cells to use insulin available. Insulin controls the carbohydrate, fat and protein metabolism.

Causes: **(1 mark for any four causes of the following)**

1. Pancreatic disease: defect in the synthesis of insulin or decrease in the number of beta cells.
2. Heredity
3. Sedentary life style: Lack of exercise.
4. Diet: Rich in carbohydrate and fats
5. Obesity
6. Viral infections: This may lead to beta cells destruction.
7. Stress

Control: **(1 mark for any 4 control measures of the following)**

Though diabetes cannot be cured it can be effectively controlled by adopting following measures:

1. Maintenance of normal body weight by exercise and dietary control.
2. Regular checkup of urine sugar and blood sugar should be done.
3. Personal hygiene including care of feet and skin should be taken care of.
4. Treatment with insulin and oral antidiabetic agents like Tolbutamide, Glipizide, Glibenclamide etc.



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5. Since NIDDM appears to be linked with sedentary life style, over nutrition, obesity, correction of these may reduce the risk of diabetes and its complications.
6. Alcohol should be avoided, as it indirectly increases the risk of diabetes.
7. Subjects at risk should avoid diabetogenic drugs like oral contraceptives

c) "Rhythm method for contraception is effective method only for literate couples" Explain the statement with reasons. **(1 mark for method)**

Rhythm method: It is known as Safe period or calendar method. The method is based on the fact that ovulation occurs from 12 to 16 days before the -onset of menstruation The couple is advised to avoid intercourse from 10th to 18th day of menstrual cycle counting from the first day of menstrual cycle. Because during these days the conception can occur. While the period before and after this (i.e. day 1-9 and 19-28) is a safe period during which conception can not occur.

Reason: (2 marks)

Woman's menstrual cycles are not always regular and so it is difficult to predict the safe period. The failures of the method are mainly due to wrong calculations and the literate couples will have the advantages of avoiding the mistakes of counting the days. Therefore Rhythm method for contraception is effective method only for literate couples

d)What is artificial respiration ? Explain "Kiss of life" (Mouth to mouth respiration).

(Definition 1 mark, explanation 2 marks)

Artificial respiration is the act of assisting or restoring the breathing by giving mouth to mouth or mouth to nose respiration, when breathing has stopped. **(1 mark)**

Mouth to mouth respiration: In this Pinch the patients nostrils, take a deep breath, then tightly seal the patient's mouth with your mouth and breath out the air forcefully into his lungs. Now move up your head and inhale more fresh air and again breath out the air forcefully into his lungs. Repeat this process rapidly number of times, so as to saturate the



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Patient's blood with oxygen, (About 12 breathings / minute) .Continue till the patient starts breathing by his own.

This is called as kiss of life because, without oxygen a person cannot survive for more than 3 minutes. So when breathing has stopped, and if mouth to mouth or mouth to nose respiration is given it can be vitally important for victim as the oxygen present in the expired air (contains about 16% oxygen) is quite sufficient to restore his breathing.

e) What are proteins? State the functions of proteins.

Proteins: (Definition 1 mark)

These are complex organic nitrogenous compounds and are composed of carbon,hydrogen,oxygen,nitrogen,sulphur and occasionally phosphorous,iron and other elemrnts.

Functions of proteins: (2 marks)

1. Growth and repair of body cell and tissues.
2. Synthesis of the hormones,plasma proteins and antibodies(immunoglobulins),haemoglobin,enzymes.
3. Provision of energy:Spare amount of proteins can be used for the production of heat and energy(Secondary function).



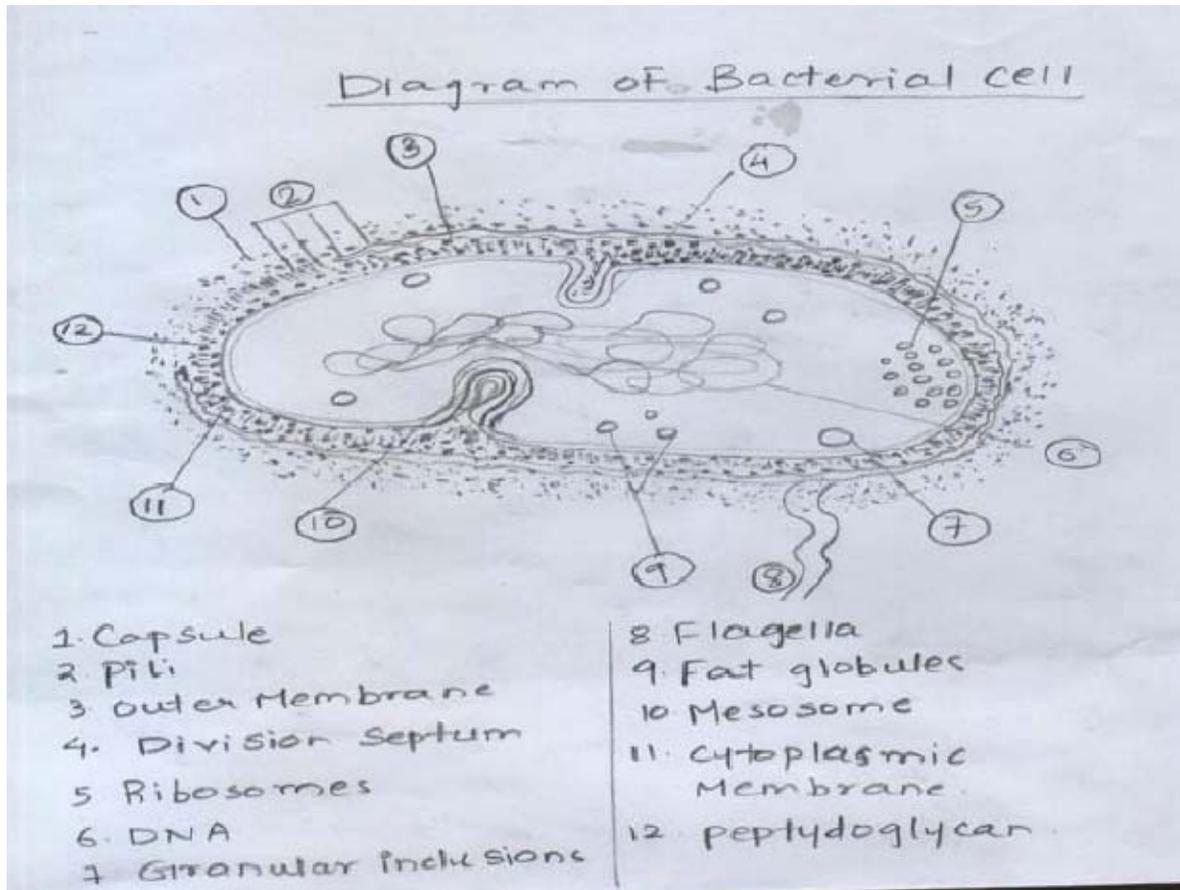
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f) Draw a well labelled diagram of bacterial cell.(diagram 2 marks, labels 1 mark)





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Q.3 Answer any four of the following:

a) What is hypertension? (1/2 mark) Discuss the causative factors (1 mark), symptoms(1/2 mark)and prevention of cardio vascular diseases (1 mark).

Hypertension means consistent high blood pressure, more than 140/90 mm of Hg-systolic/diastolic.

Causative factors :(any 4 of the following)

1. Age
2. Obesity
3. High cholesterol levels
4. Hypertension,
5. diabetese mellitus
6. sedentary lifestyle (physical inactivity)
7. Fatty and salty diet
- 8.Hereditary
9. Bad habits such as cigarette smoking and alcohol

Symptoms: Severe chest pain and pain in the left side of the body, Tightening of the chest, Breathlessness, headache.

Prevention: (Any four of the following)

1. Maintenance of standard weight – control obesity.
2. Avoid smoking and excessive alcohol intake.
3. Restrict intake of fats, sugars and salt.
4. Control hypertension and diabetes.
5. Avoid stress and strain in life.
6. Regular exercise
7. Increase consumption of vegetables, fruits.
8. Annual medical check up



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b) State the types of cancer (**1/2 mark**) and write causative factors (**1 mark**), preventive measures of cancer (**1 ½ mark**).

Types of cancer:

1. Solid tumours .
2. Leukemias and Lymphomas.

Causative factors: (Any four of the following)

1. Bad habits such as consumption of Tobacco and alcohol
2. Dietary factors
3. Occupational exposures to carcinogenic chemicals
4. Viruses
5. Customs and life styles
6. Environmental factors

Preventive measures:

1. Try to avoid and protect against known carcinogenic agents like chemicals , drugs , radiations .
2. Avoid bad habits such as tobacco and alcohol
3. Maintain Personal hygiene
4. Immunization against Hepatitis B,Cervix cancer
5. Early detection and prompt treatment of precancerous lesions
6. Cancer awareness.

c) Define the term immunization (**1 mark**). Write “National Immunization Schedule” (**2 marks**).

Immunization is defined as production or resistance in the body by means of immunological agents.



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National immunization schedule: Immunization is a mass means of protecting large number of population. Each country has its own immunization schedule based on their local needs. The Indian version of National Immunization Schedule to protect the children against six vaccine-preventable diseases -Diphtheria, Whooping Cough, Tetanus, Polio, Tuberculosis, Measles is as mentioned below.

Beneficiaries	Age	Vaccine	No.of doses and route of administration.
Infants	6 weeks to	DPT and	3 intramuscular
	9 months	Polio (OPV)	3 oral
Children	At birth	BCG	1 intradermal
	9 to 12 months	Measles	subcutaneous
	16 to 24 months	DPT (I booster)	1 intramuscular
		Polio (I booster)	1 oral
	5-6 years	DT (II booster)	1 intramuscular,
		Typhoid	(Two doses if not immunized previously) 2 subcutaneous.
Pregnant women	10 years	Tetanus toxoid	1 intramuscular
		Typhoid	1 subcutaneous
		16 years	Tetanus toxoid
		Typhoid	1 subcutaneous.
	16 to 36 weeks of pregnancy	Tetanus toxoid	2 intramuscular.



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d) What is solid waste? **(1 mark)** Write in brief the various methods of solid waste disposal. **(2 marks. Any 4 methods)**

Solid wastes are the unwanted, discarded material from domestic, commercial, industrial and agricultural operations. It is also called as refuse or litter. It comprise of dust, ash, vegetables, fruits, paper and packaging of all type, rags and other fabrics, combustible, non combustible debris.

1. Dumping: dry refuse is mainly dumped in low lying areas which help not only in disposal but also in reclamation of land. By the action of bacteria, the volume of the refuse decreases considerably in volume and is converted gradually into humus. It is not an ideal method.
2. Controlled tipping or sanitary landfill: this is the most satisfactory method of refuse disposal. In this method a trench is dug. The refuse is compactly dumped in these pits and at the end of each working day is covered with earth, when the trench is full, again it is covered with earth and is compacted. In this method the chemical and bacteriological processes decompose the refuse into simple substances with generation of heat.
3. Burning: Refuse can be disposed off hygienically by burning. Hospital refuse which is particularly dangerous is best disposed off by burning.
4. Composting: it is a method of combined disposal of refuse and night soil. The basic principle is, when the refuse and night soil (excreta) are dumped in a pit and covered with earth there is anaerobic decomposition. The heat produced during decomposition kills the organisms and ultimately we get compost, which is used as a manure.
5. Burial: it is useful for small scale disposal like camps. In a small trench or pit the refuse is collected and at the end of each day it is covered with 20-30 cm of earth. The contents of the pit may be taken out after 4-6 months and used on the fields.



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e) Why the bacteria are stained? (1 mark) Explain the method of gram staining. **(2 marks)**

The bacteria's are stained to study the overall structure of the micro-organisms, to identify their internal structures and to help identify and separate similar organisms.

Gram staining: This is widely used differential techniques for bacteria.

Technique: (1 mark)

Transfer a loopful of the liquid culture to the surface of a clean glass slide, and spread over a small area and form a film. Allow the film to air dry. Fix the dried film by passing it briefly through the Bunsen flame two or three times without exposing the dried film directly to the flame. The slide should not be so hot as to be uncomfortable to the touch.(0.5 mark)

Steps :(2 marks)

i) Flood the slide with crystal violet (violet dye) solution for up to one minute. Wash off briefly with tap water (not over 5 seconds). Drain.

ii) Flood slide with Gram's Iodine solution (A mordant which fixes the dye inside the cell), and allow to act for about one minute. Wash off with tap water. Drain.

iii) Remove excess water from slide and blot, so that alcohol used for decolorization is not diluted. Flood slide with 95% alcohol (a decolorizer which removes the dye from certain bacteria) for 10 seconds and wash off with tap water. Drain the slide. Counter stain with safranin(red dye) solution for 30 seconds. Wash off with tap water. Drain and blot dry

Gram –positive bacteria retain the violet colour of methyl crystal violet and appear violate.e.g staphylococci,streptococci,pneumococci,C.diphtheria,B.antrasis.Gram negative bacteria lose the crystal violate and get washed with alcohol and are stained with red dye safranine and appear red,e.g.gonococci,meningococci,E.coli,Styphi



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f) Name any four diseases transmitted by rodents (1 mark). Explain in brief how to control rodents. **(2 marks)**

The diseases transmitted by rodents are **(any 4 names of the diseases)**

Plague, leptospirosis, salmonellosis, encephalitis, amoebiasis, leishmaniasis

Control of rodents:

If the basic requirements like food, water and shelter are not made available to the rats by environmental sanitation, their population will gradually decrease. The buildings should be cemented rat proof, food should be properly stored and garbage should be properly collected, stored and disposed off. Whenever the rodents enter the houses they may be trapped in cages or food containing rat poison is made available to rats. Single dose of rodenticides are popularly used for controlling rats. These include barium carbonate and zinc phosphide. Rat burrows can be fumigated with calcium cyanide, carbon disulphide, methyl bromide or sulphur dioxide. After fumigating, the burrows are sealed immediately.

Q.4 Answer any four of the following: **(3 marks each question)**

a) Give the advantages **(2 marks)** and disadvantages **(1 mark)** of condom.

It is one of the temporary methods of contraception. It is physical barrier type of method.

1. Easy to use, no medical supervision required.
2. Cheap, easily available
3. No side effects
4. Disposable
5. Gives protection against sexually transmitted diseases



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Disadvantages:

1. May slip off or tear during intercourse.
2. May interfere with sex sensation.

b) Name the determinants of health (**1 mark**) and explain any two (**2 marks**).

The determinants of health are:

1. Heredity
2. Environment
3. Life style
4. Socio economic conditions
5. Primary health care system

(Explain any 2 of the following determinants)

1. Heredity: state of health of an individual to some extent depends on his genetic make up. Many diseases like haemophilia, diabetes are well known hereditary disorders. Genetic defects can also lead to uncommon adverse drug reactions.

2. Environment: it can be discussed in 3 parts.

- i) Internal environment: it is concerned with his each and every component, part, tissues, organs and their smooth functioning.
- ii) External environment: it consists of those things to which a person is exposed i.e. air, water, etc. which includes biological and social environment. For example: person staying in polluted areas can develop some kind of health disorder like asthma.
- iii) Micro environment or domestic environment: it includes the individual's way of living and life style.



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3. Life style: life style is the way people live. It consists of cultural and behavioral patterns and lifelong personal habits. A person having good life style i.e. balanced diet, enough sleep, sufficient physical activity can maintain good health status. An individual learns the life style through parents, friends, school, etc. Some personal habits are bad to health. For example: smoking, alcoholism, drug addiction, poor hygiene, lack of cleanliness, improper food etc.

4. Socio economic conditions: -

Socio economic conditions like per capita GNP, education, economic status, political system, employment, housing etc. have great deal of influence on human health. Better economic status is major factor in reduction of morbidity, increasing life Expectancy and improving quality of life. Education improves overall human attitude to health. It compensates the effects of poverty on health. For example, low mortality rate in Kerala due to high literacy rate.

Occupation directly influences the economic status of a person.

The fourth important socio-economic condition influencing health is political system of country which is committed to provide improved health care by framing and implementing prior policies and by allocating necessary funds.

5. Primary health care system:

These indicators reflect the equity of distribution of health resources in different parts of the country and provision of health care. The important indicators are:

1. Doctor –population ratio
2. Doctor-nurse ratio
3. Population – bed ratio
4. Population per health / sub centre
5. Population per traditional birth attendant



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c) What is fracture? **(1 mark)** Describe general first aid for fracture. **(2 marks)**

What is fracture: **(1 mark)**

A break or a crack in a bone is known as fracture. Usually pain, swelling, inability to move the affected body parts are some of the important symptoms.

First-aid (2 marks)

Depends on type & location of fracture. General treatment is as follows.

1. Reassure and calm the person
2. Check the breathing
3. Control bleeding if any by applying pressure bandage
4. Examine for other injuries, cover wounds with sterile dressing
5. Immobilize the fractured part immediately by using bandages or splint or any similar material available at the spot)

d) What are the effects of air pollution on health? **(3 marks)**

1. Air pollution causes several effects on health and it has contributed to increase in morbidity and mortality
2. Respiratory tract disorders are common such as asthma, bronchitis and lung cancer.
3. Air pollution also affects respiratory system of animals
4. It also causes retardation of growth in plants, spotting, burning of leaves etc.

e) Give causative agents, **(1 mark)** mode of transmission **(1 mark)** and prevention of 'Measles'.
(1 mark)



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Causative agents: RNA paramyxovirus commonly called as Rubeola virus.

Mode of transmission: Airborne transmission occurs directly from person to person mainly by droplet infection,

Prevention:

1. Use of measles vaccine. A single dose of vaccine is administered subcutaneously in children of 9-12 month age group.
2. Isolate the patient as soon as the signs and symptoms appear.
3. Disinfect the discharges from nose and throat.

f) What are vitamins? (1 mark) Classify it. (0.5 mark) Explain functions (0.5 mark) and deficiency symptoms of vitamin C. (1 mark)

Vitamins are the organic substances which are required for the normal functioning, growth and development of the body, but these are not synthesized in the body and hence should be supplied through the diet.

Vitamins can be classified as :

- a) Fat soluble vitamins
- b) Water soluble vitamins

Functions of vitamin C:

1. Formation of intracellular matrix.
2. Maturation of RBC.

Deficiency of vitamin C causes scurvy.

Symptoms are bleeding in the gums, anemia, hemorrhages, and slow wound healing.



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Q.5. Answer any four.

(12)

a) First aid treatment for 'Snake bite' (**3 marks**)

1. Assure the patient for his or her life being saved.
2. Apply firm pressure over the area of snake bite to avoid or delay poison circulation and absorption.
3. Apply a broad firm bandage around the limb and on bitten area.
4. Immobilize the limb to minimize the spread of venom.
5. Make a cross incision 1cm long and 0.5cm deep over each bite mark and allow to bleed.
6. Suck out the poison from wound and spit it out.
7. Clean the wound with sterile saline or water, cover it with sterile dressing.
8. Patient should be shifted to hospital as early as possible.

b) Deficiency disease of iron (**1 mark**) and calcium. (**2 marks**)

Iron deficiency diseases:

Microcytic hypochromic anaemia characterized by weakness, decreased resistance to infections, decreased work stamina

Calcium deficiency diseases: Osteoporosis, Osteomalacia, Rickets which are characterized by bone pain, weakness.



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c) Causative agent, signs and symptom, prevention of Typhoid.

(Causative agent-1 mark, sign& symptom-1 mark, prevention-1 mark).

Causative agent: It is an acute communicable disease caused by bacteria *Salmonella typhi*.

Sign & symptoms: Continuous fever for 3 to 4 weeks, relative bradycardia, body pain

Prevention:

1. Public should be educated for sanitation and personal hygiene
 2. Immunization with TAB vaccine containing *S.typhi*, *S.paratyphi A* and *S.paratyphi B*.
 3. Water and milk should be consumed only after proper boiling.
- d) Nosocomial infections Factors responsible for Nosocomial infections.

(1 Mark for definition, 2 Marks for any four factors each of 0.5 Mark)

It is also called as Hospital Acquired infection and is an infection which patient doesn't have at the time of admission but is acquired during the stay in the hospital.

Factors responsible for Nosocomial infections:

1. Hospital staff suffering from infections.
2. Infected hospital staff attending the patient.
3. Persons visiting the hospitals to see the patients.
4. Due to unsterile surgical instruments, dressing, etc.
5. Due to infected syringes and needles.
6. Lack of cleanliness
7. Decreased resistance power of the patients



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e) Classification of contraceptive methods. Explain Copper T and Lippe's loop.

(Classification 2 Marks, Copper T & Lippe's loop 1 mark).

Classification of contraceptive methods:

A) Temporary methods (spacing methods):

I. Barrier methods

1. **Physical methods:** Condoms for male, Diaphragms, vaginal sponge for female.
2. **Chemical methods:** Foam tablets, creams, suppositories, jellies and pastes.

II. Intrauterine devices(IUDs)

1. Medicated IUDs
2. Non medicated IUDs

III. Hormonal methods

1. Oral pills
2. Slow released preparations, e.g. vaginal rings, implants.

IV. Post conception methods:

1. Menstrual regulation
2. Menstrual induction
3. Abortion.

V. Natural methods (miscellaneous methods)

1. Abstinence
2. Coitus interruption
3. Safe period(rhythm method)
4. Cervical mucus method.



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VI. Permanent Methods/Terminal methods/Sterilization Methods

1. Male sterilization (Vasectomy)
2. Female sterilization (Tubectomy)

Copper-T and Lippe's loop: These are the Intra Uterine Devices used to stop the fertilization of ovum in the uterus.

Lippe's loop is inert plastic device and Copper –T having copper incorporated in plastic device which shows antifertility effect.

f) Explanation of level of prevention of disease. **(1 Mark for each level)**

Primary prevention:

- i) It is an action taken prior to the onset of disease, which removes the possibility that disease will ever occur.
- ii) It is exercised to promote general health and well being and quality of the people.
- iii) It is a safe and low cost way of prevention of disease.

Secondary prevention:

- i) It is an action which is taken to half the progress of a disease at its early stage and to prevent complications.
- ii) It arrest the disease process by early diagnosis and treatment
- iii) It is an important tool to control of transmission of diseases.
- iv) It is often more expensive and less effective than primary prevention.



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Tertiary prevention:

- i) It is all measures available to reduce or limit impairment and disabilities.
- ii) It minimizes suffering caused by existing departures from good health and to promote the patients adjustment to irremediable conditions.
- iii) Tertiary prevention includes disability prevention and rehabilitation of the patients.

Q.6 Answer any Four

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- a) Causative agent, mode of transmission and prevention of AIDS.

(Causative agent-1 Mark, mode of transmission-1.5 Mark, prevention-1.5 Mark)

Causative agent:

AIDs is caused by a virus known as human immunodeficiency virus (HIV).

Mode of transmission:

1. By sexual contact.
2. Transmission through blood, transfusion, using infected injection, equipment razors, etc.
3. From infected mother to fetus through placenta.
4. Through contaminated needles and syringes.

Prevention:

1. Avoid sex with multiple partners.
2. Use of condoms during intercourse.
3. Use of sterilized needles, syringes and surgical equipment.
4. Screening of blood donors.



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5. Use of new razors for every person in hair cutting saloons.
6. Blood and blood products should be screened for AIDs before transfusion.
7. Health education to the public regarding dangerous effects of AIDS.

b) What is stroke? Causes, symptom and prevention of stroke. **(1 Mark for definition, cause-1 mark, symptoms-1 mark, prevention -1 mark)**

Stroke is an acute severe manifestation of cerebrovascular disease of focal disturbance of cerebral function lasting more than 24 hrs or leading to death, with no apparent cause other than vascular origin.

Causes:

Uncontrolled hypertension, diabetes mellitus, thrombosis.

Symptoms: Severe headache, dizziness, confusion, trouble in walking, trouble in speaking, numbness or weakness in face, arm or in legs, blurred vision.

Prevention: By controlling hypertension, controlling diabetes and by elimination of smoking.

c) State various methods of isolation of bacteria. Describe in detail streak plate method.

(1 for enlisting various methods, 3 Marks for streak plate method).

Methods of isolation:

1. Streak plate method
2. Pour plate method
3. Single cell isolation
4. Direct transfer technique
5. Serial dilution technique



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Streak plate method:

Small amount of sample is transferred on a suitable sterile solid nutrient medium in petridish.

Sample is streaked by a Nicrome –wire in such a way that, streaking provides successive dilution and thereby the isolated colonies.

Streaking of solid culture media in a petridish is done by different methods:

1. Square method:

- i. One loop full suspension is streaked on solid nutrient medium in horizontal line first.
- ii. Plate is rotated anticlockwise in 90 degree and again streaks are made in vertical lines giving rise to square of streaking.
- iii. Last square will give maximum dilution of sample and so the isolated colonies.

2. Four quadrant method:

- i. A loop full of sample is placed at one spot $\frac{1}{2}$ cm away from periphery of petridish, on solid culture medium.
- ii. Linear streaks are made.
- iii. From end of first streak second streaks are made by rotating plate anticlockwise.
- iv. Likewise four streaks are made.
- v. Last streak do not touch the original spot.
- vi. Dilution of sample is achieved and so, on last streak isolated colonies are obtained.



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3. Zig-zag method:

- i. A loopful of sample is streaked on solid nutrient agar medium in Zig-zag manner.
- ii. This allows maximum dilution of terminal end of zig-zag streak, where isolated colonies are obtained.

d) Explain first aid for: **(1 mark for each term)**

1) Corrosive acids:

- i. In case of superficial burns with corrosive acids wash with water and apply neutralizing chemicals such as mild alkalies.
- i. If the patient is suspected to have consumed corrosive acids orally, do not induce vomiting, rinse the mouth with plenty of cold water and give chalk powder, milk of magnesia, sodium bicarbonate or ENO in water.

2) Corrosive alkalies:

- i. In case of superficial burns with corrosive alkalies, wash with water and apply neutralizing chemicals such as vinegar.
- ii. If the patient is suspected to have consumed corrosive acids orally, do not induce vomiting, rinse the mouth with plenty of cold water and give lemon juice, vinegar, butter milk.

3) Insecticides:

- i. If poisoning through skin has occurred, wash the affected area with plenty of water, asks the patient to drink plenty of water, so as to facilitate the excretion of poison through urine.
- ii. Antidotes are given e.g. DAM (Diacetyl Monoxime), atropine sulphate.



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4) Sleeping tablets:

- i. If the patient is conscious induce vomiting to remove the unabsorbed poison from the GIT by using suitable emetic such as 15gm of mustard powder in a glass of warm water or two table spoonful of common salt in a glass of warm water can be used.
 - ii. Gastric lavage should be done with the help of stomach tube in the hospital.
- e) What do you know about immunological products? State various types and explain vaccines.

(1 Mark for definition, 1 Mark for types, 2 Marks for explanation of vaccines.)

The substance or live organisms which when administered into the body of a susceptible person make him immune against one particular disease are called immunizing agents or immunological products.

Types of immunological products:

- a) **Vaccines:**
- b) **Immunoglobulins**
- c) **Antisera or Antitoxins.**

Explanation of Vaccines: (Definition of the term 1 mark)

Vaccines are immunological products derived from the different biological sources to provide protection against a specific disease.

(Description of any 2 of the following vaccines 1 mark)



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Live vaccines:

1. Live attenuated vaccines contain live organisms which have antigenic properties but they have lost their disease producing capability.
2. Live vaccines are available for- e.g measles, poliomyelitis, yellow fever, tuberculosis etc.

Inactivated (killed) vaccines:

1. The disease organisms are killed or inactivated and then purified extract is injected into the body containing antigens.
2. It is available in combination with toxoids. E.g. pertusis component is killed in DPT vaccine whereas diphtheria and tetanus are as toxoids.

Toxoids:

1. Toxoids are used to produce endotoxins, this endotoxin is detoxicated and is used as vaccine.
2. It injected into the body to stimulate the production of antibodies against toxin.

Cellular fraction:

1. Instead of whole organism a part or fraction of the organism is used for vaccine production.
2. It can be the cell wall of the organism, polysaccharide antigen as in meningococcal meningitis or pneumococcal vaccine.

Combined vaccines:

1. If any of the two types of vaccines are combined with each other and given in one dose it is called combined vaccination.
2. These are used to reduce the cost of production and to increase the ease of administration. e.g. DPT vaccine.



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f) Name the vitamins causing the following deficiency diseases: **(1 Mark for each)**

1. **Xerophthalmia:** Vitamin A (Retinol)
2. **Rickets :** Vitamin D
3. **Megaloblastic anemia:** Vitamin B₁₂ (Cynocobalamine)
4. **Beri-beri:** Vitamin B₁ (Thamine)