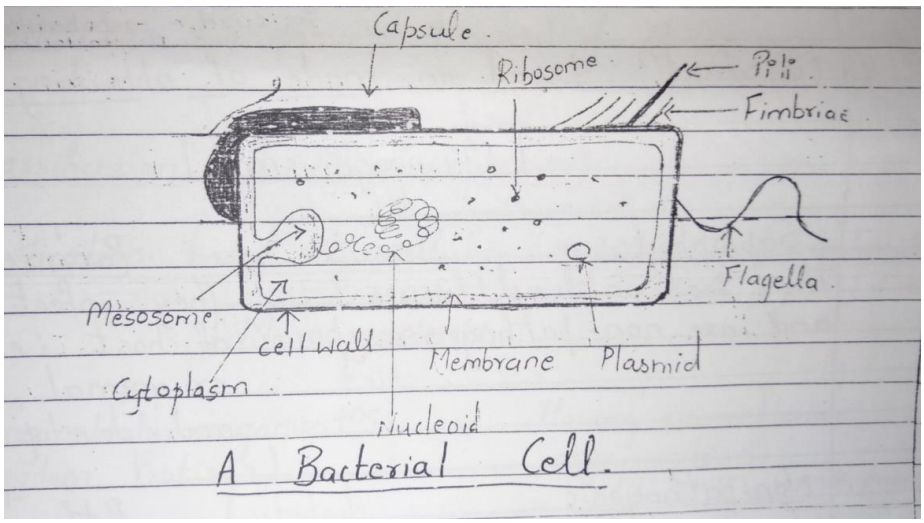
Subject Title: HEALH EDUCATION AND COMMUNITY PHARMACY Subject Code: 0810

Important Instructions to examiners:

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

Q. No.	Sub Q.N.	Answer	Marking Scheme
1		**Answer any Eight of the followings:**	**16 M (8X2=16 M)**
1	**a)**	**Define the terms:** **a) Physical Health** Physical health is the perfect functioning of the body i.e. a state in which every cell and every organ is functioning at optimum capacity and in perfect harmony with the rest of the body. **b) Mental Health** It is defined as a state of balance between the individual and surrounding with self-confidence, self-control and has respect for others. **OR** A state of harmony between one self and others, coexistence between the realities of the self and that of other people and that of the environment	**2M (1+1=2)**
1	**b)**	**Name the disease caused by: (any two)** (i) *Salmonella typhi*- Typhoid (ii) *Wuchereria bancrofti*- Filiriasis (iii) Lyssa virus type -1 - Rabies	**2M (1x2=2)**
1	**c)**	**Write object of first aid.** i. To prevent any danger to life. ii. To prevent further injury and deterioration of the condition of the patient. iii. To give relief from pain. iv. To make medical care available at the earliest.	**2M (0.5×4=2)**
1	**d)**	**Give the long forms of the following abbreviation:** i. HIV-Human Immunodeficiency Virus	**2M (0.5×4=2)**

		ii. CHD-Coronary Heart Disease iii. STD- Sexually Transmitted Diseases iv. UTI- Urinary Tract Infection	
1	**e)**	**Write the role of 'Pharmacist in promoting family planning?** The pharmacist can play role in promoting family welfare/planning by following ways: **(Any 4 points of the following)** 1. Explain importance of small family norm. 2. Tell about proper spacing of children. 3. Guide the community about contraceptive devices. 4. Guide in general about health care and proper nutrition of "would be mother". 5. Guide about bad effects of population explosion the country is facing and so the importance of population control.	**2M** **(0.5×4=2)**
1	**f)**	**Define Kwashiorkar disease. Give its symptoms.** **Definition:(1 mark)** It is protein deficiency disease seen in children of group 1 to 4 years. **Symptoms: (1 mark)** Edema, depigmentation of hair and hair loss, GI disturbances as anorexia and diarrhoea, hepatomegaly, mental changes, sometime muscle wasting, apathy, etc.	**2M** **(1+1=2)**
1	**g)**	**Define Zoonotic disease. Classify them.** **Definition:(1 mark)** These are the diseases which are transmitted from animals to human beings. **Classification :(1 mark for any 4 classes)** i. Bacterial Zoonoses- e.g. Plague, anthrax, Brucellosis, etc. ii. Viral Zoonoses- e. g .rabies, yellow fever, influenza, etc . iii. Ricketssial Zoonoses-e.g. murine typhus,tick typhus , scrub typhus,etc. iv. Protozoal Zoonoses-eg. Toxoplasmosis, leishmaniasis, trypanosomiasis. v. Helminthic Zoonoses- eg. Echinococcosis, taeniasis,	**2M** **(1+1)**

		schistosomiasis,etc vi. Fungal Zoonoses – eg. deep mycosis – histoplasmosis,cryptococcosis. vii. Ectoparasites- eg. Myiasis, scabies.	
1	**h)**	**Name the disease caused due to deficiency of :** i. Vitamin A- Night blindness, Bitot's Spot, Conjunctival Xerosis, Xerophthalmia. ii. Vitamin B- Beri- Beri, Pellagra. iii. Vitamin C- Scurvy iv. Vitamin B12- Pernicious anemia	**2M** **(0.5×4=2)**
1	**i)**	**What is composition of Oral Rehydration Salt [ORS]?** Following is the Composition of ORS: 1. Sodium chloride – 3.5 gm/L 2. Sodium bicarbonate – 2.5 gm/L 3. Potassium chloride – 1.5 gm/L 4. Glucose – 20 gm /L.	**2M**
1	**j)**	**Draw a well labelled diagram of Bacterial Cell**  	**2M**

1	**k)**	**Write immunization schedule for children**. Each country has its own immunization schedule based on their local needs. Indian schedule gives protection for children against six vaccines preventable diseases. i.e. Diphtheria, whooping cough, tetanus, polio, TB, measles.	**2M**

Beneficiaries	**Age**	**Vaccine**	**No.of doses and Route of administration.**
Children	16 to 24 months	DPT (I booster)	1 intramuscular
		Polio (I booster)	1 oral
	5-6 years	DT (II booster)	1 intramuscular, (Two doses if not immunized previously)
		Typhoid	2 subcutaneous.
	10 years	Tetanus toxoid	1 intramuscular
		Typhoid	1 subcutaneous
	16 years	Tetanus toxoid	1 intramuscular
		Typhoid	1 subcutaneous

1	**l)**	**Differentiate between Communicable Diseases and Non-Communicable Diseases.(Any 4 points of differentiation)**	**2M (0.5×4=2)**

Communicable Disease	**Non-communicable Disease**
It is caused due to some infectious agent.	It is caused due to multiple causes but not due to Infectious agent.
It can be transmitted from one person to another directly or indirectly.	It cannot be transmitted from person to person directly or indirectly
It can be transmitted by any as air, water, soil, dust ,food,	It cannot be transmitted by any agency

			sputum etc.	
			It possesses definite onset and Incubation Period.	These do not possess definite onset& may possess very long latent period
			These are not genetic in origin	These can be genetic in origin e g. Diabetes or certain heart diseases
			Eliminating infectious agents can control these diseases.	Avoiding risk factors as smoking, alcohol consumption, stress, etc. are some ways to control these diseases.
			Examples: Rabies, chicken pox, Tuberculosis etc.	Examples: Cancer, Blindness etc.
2		**Attempt any FOUR of the followings**		**12M** **4X3=12**
2	**a)**	**Discuss methods of solid waste disposal. :(Any 3 methods 1 mark each)** **Solid waste is disposed of by using following methods.** 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.		**3M** **(1 +1+1)**

		3. **Burning:** Refuse can be disposed of hygienically by burning. Hospital refuse which is particularly dangerous is best disposed of 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 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.	
2	**b)**	**Write sources, functions & deficiency diseases of Vitamin A.** **(1 mark each for Sources, functions, deficiency diseases)** **Sources:** Milk and milk products, eggs, fish, green and orange /yellow vegetables. **Functions:** Maintains healthy epithelial tissues, maintains normal vision **Deficiency diseases:** Night blindness, Keratinization, Xerophthalmia.	**3M** **(1+1+1)**
2	**c)**	**Define demography. Explain stages of Demographic cycle.** **Definition: (0.5 M)** Demography is the scientific study of human population. **Demographic Cycle : (2.5 M i.e 0.5 mark for each stage)** It comprises of following 5 stages – **i) First Stage:** It is "High Stationary Stage ". The feature of this phase is both natality i.e. birth rate and mortality i.e. death rate are very high. Both cancel each other keeping population steady. India was in this phase till 1920. **ii) Second Stage:** It is "Early Expanding Stage ". Here mortality starts falling down but birth rate remains same i.e. higher. As a result population starts increasing.	**3M** **(0.5+2.5)**

		At present African and South Asian countries are in this phase. **iii) Third Stage:** It is "Late Expanding Stage ". Her mortality continues to fall but birth rate also started decreasing. But yet birth rate remains higher than death rate. So population continues to increase. China, India, Singapore are at this stage. **iv) Fourth Stage:** It is "Low Stationary Stage ". It is also called Zero Growth stage as birth rate equals death rate and both are lowered. So net population growth is zero. Many developed countries have reached this stage in last 20 years. **v) Fifth Stage:** It is "Negative Growth Stage". Here death rate is higher than birth rate. So there is decline in population size. Reasons behind are advancement in medical science and facing problems of population increase. Germany and Hungary are presently at this stage.	
2	**d)**	**Write Symptoms and first aid treatment for shock.** **Symptoms: (1 mark for any 4 symptoms)** 1. Weakness, dizziness, nausea, fainting. 2. Pallor and sweating 3. Fast and weak pulse-slow or irregular 4. Skin becomes pale and cold. 5. Pupils dilated, vision- blurred. 6. Difficulty in breathing. 7. Temporary loss of consciousness. **8.** Patient feels thirsty; sometimes the patient may be alert but suddenly may collapse. **First-Aid treatment for shock: (2 marks)** 1. Reassure the patient 2. Loosen the clothes of victim 3. Raise the level of legs	**3M** **(1+2)**

		4. Keep the patient warm with blanket 5. Start CPR if pulse is absent and/or breathing is weak.	
2	**e)**	**Enlist various determinants of health & discuss any one.** **Determinants of health:(2 marks for enlisting any 4 of the following)** (i) Heredity (ii) Life style (iii) Environment (iv) Socioeconomic conditions (v) Health and Family welfare services **(1 mark for discussing any 1 determinant of the following)** **i) Heredity:** The genetic makeup of an individual is unique and it cannot be changed. A number of diseases are of genetic origin. eg. Hemophilia, **(ii)Life style**: It is the way people live. It reflects the social values, attitudes and activities of an individual. It is composed of cultural and behavioural patterns and lifelong personal habits like smoking, alcoholism etc. Health requires healthy lifestyles. Many diseases are associated with lifestyles. e.g. Obesity, heart diseases. **(iii) Environment:** Health of a person depends on the Internal environment and External environment. Internal environment refers to the coordinated, harmonious functions of every component (system) of the body, which is known as homeostasis in the body. External environment refers to all the things in the surrounding of the individual to which he is exposed. Environment has direct impact on the physical, mental and social well-being of those living in it. The environmental factors range from housing, water supply, family structure, stress etc. **(iv) Socioeconomic conditions:** Health status is significantly determined by the Socioeconomic levels which are primarily determined by, Economic status, Education, Occupation and Political system. **(v) Health and Family welfare services:** These services cover a wide spectrum of personal and community services for treatment of disease, prevention of illness and promotion of health. The purpose of health services is to improve the health status of population. e.g. (1) Immunization, general screening programmes for infectious	**3M** **(2+1)**

		diseases. Family planning programmes. (2) Adequate supply of safe drinking water, proper sanitation.	
2	**f)**	**Write importance and procedure for Gram Staining** **Importance: (1 mark)** It's a differential stating procedure and helps to identify different types of bacteria. The Gram stain is commonly used differential staining technique for bacteria. **Procedure: (2 marks)** Prepare the smear and the follow the steps. i) Flood the slide with crystal violet 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, 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 decolourization is not diluted. Flood slide with 95% alcohol for 10 seconds and wash off with tap water. Drain the slide. iv) Counter stain with safranin solution for 30 seconds. Wash off with tap water. Drain and blot dry. v) All slides of bacteria must be examined under the oil immersion lens.	**3M** **(1+2)**
3		**Attempt any FOUR of the followings**	**12M** **(4X3=12)**
3	**a)**	**Discuss in detail Noise Pollution.** **Definition: (1 mark)** It is defined as unacceptable sound i.e. the sound not pleasant to hear. **OR** It is defined as wrong sound at wrong place at wrong time. **Effects of Noise: (1 mark)** **A) Auditory Effects:** i) Whistling and buzzing sounds in ears.	**3M** **(1+1+1)**

		iii) Temporary hearing loss which may lead to deafness. **B) Non-auditory Effects:** i) Difficulty in concentration ii) Feeling of fatigue. iii) Annoyance iv) Decreased efficiency vi) Physiological changes as – Headache, hypertension, increased heart rate, sweating, nausea, giddiness, sleep disturbances etc. **Noise control measures: (1 mark for any 2 measures)** a) Control of noise at source: It can be achieved by segregating noisy machines and by using mufflers or other noise reducers to machines. b) Control of transmission: This can be achieved by building enclosures and covering walls with sound absorbing material. c) Protection of exposed persons: It is recommended for all workers who are consistently exposed to noise louder than 85 dB in the frequency band above 150 HZ. Periodical audiogram check-ups, use of ear plugs, ear muffs is also essential. d) Education: Education of people through available media is required to highlight the importance of noise as a community hazards.	
3	**b)**	**Define blindness. Write causes, prevention and control of blindness.** **Definition: (1 mark)** Blindness is defined as ' visual acuity of less than 3/60 (Snellen) or its equivalent. **Causes: (1 Mark for any 2 points of the following)** 1. Vitamin A deficiency due to malnutrition and disease like measles can extremely weaken the vision. 2. Cataract, glaucoma, trachoma and other eye infections are common causes. 3. Congenital disease, tumour of eye, retinal detachment, diabetes, hypertension, and diseases of nervous system. 4. Persons working in industries and mines as occupation gets eye injuries often.	**3M** **(1+1+1)**

		5. Use of infected kajal and treatment by quacks can also lead to blindness. **Prevention and control: (1 Mark for any 2 points)** i. Improving nutrition particularly related to Vitamin A intake. ii. Proper and timely treatment of infectious diseases of eye. iii. Improving safety measures and working conditions at occupation places. iv. Regular eye check-up of children in schools followed by health education helps to prevent blindness	
3	**c)**	**Write sources of air pollution. Write its effect on health.** **Sources of air-pollution: (2 Marks for any 4 sources)** 1. Combustion of fuels: coal, wood, petrol, diesel, etc. causes tar and gaseous pollution by oxides of sulphur and oxides of carbon. 2. Automobiles: Automobiles smoke causes pollution by carbon monoxide, nitrogen oxide and oxides of sulphur 3. Industries: Chemical, cotton, cement, asbestos industry may cause pollution by tar i.e. particulate material or by gases like carbon dioxide, carbon monoxide 4. Human and animal respiration 5. Use of insecticides and pesticides 6. Decomposition of vegetables and animal matters **Effects of air-pollution on health : (1 Mark)** 1. Respiratory disorders such as bronchitis, asthma, lung cancer etc. 2. Ill effects on organs such as heart, kidney, liver, skin, eyes etc.	**3M** **(2+1)**

3	**d)**	**Write about hormonal contraceptives.** **Hormonal contraceptives methods:** **1. Oral pills:** • Combined pills with oestrogen and progesterone such as Mala- N and Mala-D. • Progestogen only pill with small amount of Norethisterone or Levonorgestrel. • Post-coital pill or emergency contraceptive pills **2. Depot (slow release) formulations :** • Injectable • subcutaneous implants • vaginal rings. **Mechanism of action of hormonal contraceptives:** 1. Inhibition of ovulation: 2. Preventing implantation by altering endometrium so that it is not conducive for implantation **Advantages :** 1.Very effective reversible method 2.Method is safe and easy to use 3. Does not interfere with sexual pleasure. 4. Regulates menstrual cycle and decreases menstrual blood loss. 5. Protects women from anaemia by minimizing blood loss. **Disadvantages:** 1.Headache 2. Depression (sometimes severe) and mood changes. 3.Nausea and vomiting 4. No protection against Sexually Transmitted Diseases. 5.Weight gain	**3M**

3	**e)**	**Define medical entomology. Discuss in detail about insect control.** **Definition: (1 mark)** Medical entomology: It is defined as the study of medically important insects (those which transmit diseases) OR A study of arthropod which transmit disease in environment is known as medical entomology **General principles of insect control:(2 Marks)** 1.**Environmental control:** It includes: a) Elimination of breeding places. b) Filling and drainage operation. c)Carefully planned water management d) Proper disposal of refuse. 2) **Chemical control:** In this various insecticides such as organochlorine, organophosphorus etc are used. 3) **Biological control:** For these living organisms are used to control environmental pollution.eg. Fish (Gumbusia) is used to control mosquito. 4) **Genetic control:** Techniques such as cytoplasm incompatibility, chromosomal translocation etc. are used in genetic control of insects.	**3M** **(1+2)**
3	**f)**	**Write about types, prevention and control of diabetes mellitus.** **Types of Diabetes mellitus: (1 Mark)** a) IDDM type 1 i.e. Insulin Dependent Diabetes Mellitus or Juvenile diabetes b) NIDDM type 2 i.e. Non-insulin Dependent Diabetes Mellitus or Maturity onset c) GDM i.e. Gestational Diabetes Mellitus	**3M** **(1+2)**

		Prevention and Control: (2 Marks for any 4 points) 1. Maintenance of normal body weight. 2. Physical exercise and dietary control. 3. Regular check-up of blood sugar level 4. Avoiding bad habits like smoking and alcohol consumption. 5. Treatment with insulin and oral anti- diabetic agents.	
4		**Attempt any FOUR of the followings**	**12M** **(4X3=12)**
4	**a)**	**Define the term fertility. Explain various factors affecting fertility.** **Definition : (1 mark)** Fertility means the ability to produce off springs or children. **Factors affecting fertility : (2 marks for any 4 factors)** **1. Age at marriage:** The fertility data on national scale reveals that females who marry before the age of 18 gave birth to larger number of children than those who married later. Early marriage is a common and long established custom in India. But according to the child Marriage Restraint Act — 1978, the legal age at the time of marriage should be, 18 years for girls and 21 years for boys **2**. **Duration of married life:** It has been observed that 10-25 % of all births occur within 1-5 years of married life, 50-55 % of all births within 5-15 years of married life, but after 25 years of married life it is very low. This data suggests that family planning efforts should be concentrated in the first few years of married life. **3. Spacing of children:** spacing of children significantly declines the fertility rate. **4. Education:** Literacy helps to decline the fertility rate. It has been observed that the total fertility rate is more among illiterate than among the literate. **5. Economic status:** There is inverse relationship between economic status and fertility rate. More the per capita income of the family less is the birth rate. The world population conference in fact stressed that "Economic development is the best contraceptive." **6. Religion and caste:** Muslims have higher fertility rate than Hindus and Hindus	**3M** **(1+2)**

		have higher fertility rate than Christians. Amongst Hindus, lower castes seem to have a higher fertility rate than higher castes. **7. Nutrition:** The economic status and nutrition are directly related to each other. But there is indirect effect of nutrition on fertility rate. All well fed societies have low fertility and poorly fed societies high fertility rate. **8. Family planning :**Family planning is an important and key factor in reducing the fertility	
4	**b)**	**Classify food. Write functions of carbohydrates and proteins.** **Classification of food: (1 mark for any 2 types of classification)** **I) By origin** A) Vegetable origin :- Green leafy vegetables, fruits B) Animal origin: - Meat, Milk, fish, eggs. **II) Classification by function :** a) Energy giving food :- cereals, dried fruits, sugars, roots, tubers b) Body building food :- milk, meat, fish poultry, eggs c) Protective food: - Green leafy vegetable, fruits, milk, eggs, liver. **III) Classification by chemical composition:** Carbohydrates, fats, proteins, vitamins, minerals **Functions of Carbohydrate : (1 mark for any two functions)** 1. They are main constituents of diet 2. They are the main source of energy (4 k cals per gram.) 3. They are essential for the oxidation of fats. 4. They are required for the synthesis of some non-essential amino acids. **Functions of Proteins: (1 mark for any two functions)** 1. Body building, repair and maintenance of tissues.	**3M** **(1+1+1)**

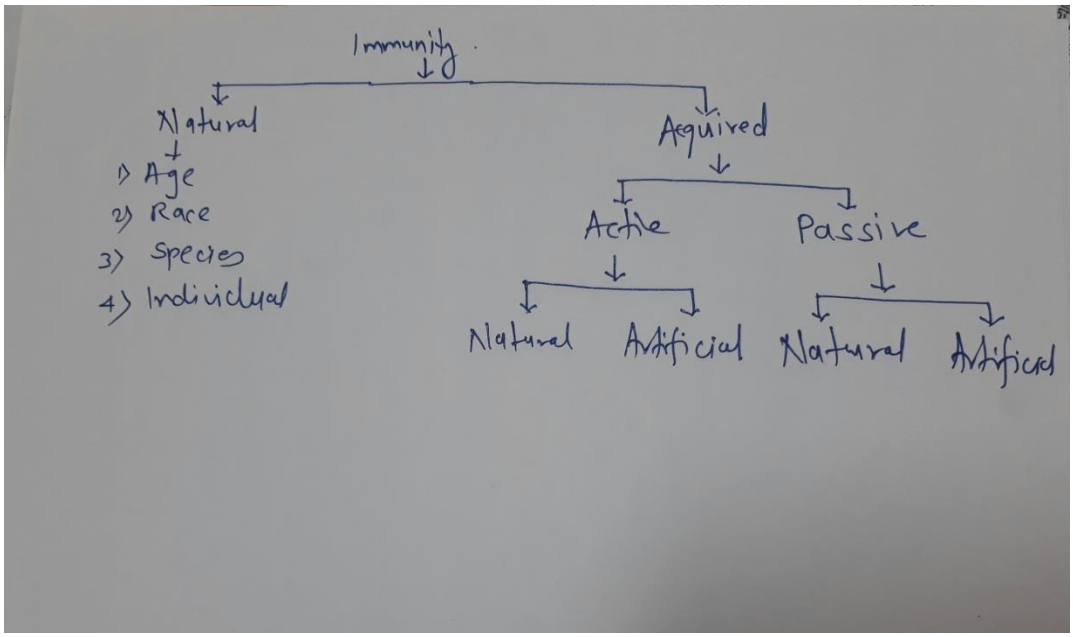
		2. Maintenance of osmotic pressure. 3. Synthesis of antibodies, plasma proteins and haemoglobin 4. Provision of energy: Spare amount of proteins can be used for the production of heat and energy.	
4	**c)**	**Define the term Immunization. Write the immunization schedule.(1 mark for definition and 2 marks for schedule)** **Definition:** Immunization is the process of protecting large number of population by producing immunity or resistance in the body by means of immunological agents (vaccines).	**3M (1+2)**

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

4	**d)**	**Classify contraceptive methods with examples.** **A. Temporary Methods** **1. Barrier methods** (a) Physical methods : i) Condom ii) Diaphragm iii) Vaginal sponge (b) Chemical methods : i) Foams ii) Creams iii) Suppositories iv) Soluble films **2.Intra – uterine device (IUDs)** (a) Non-medicated IUDs : Loops as Lippes loop (b) Medicated IUDs : i)Metal containing IUDs : Copper- 7, Copper T – 200, T.Cu- 380 A or Ag ii)Hormone containing IUDs : Progestasert **3.Hormonal methods:** (a) Hormonal pills : i) Combined pill : Mala –N , Mala –D ii) Progestogen only pill iii) Post coital pill: Tab. Unwanted 72, Tab. I pill 72 iv) Once a month pill v) Male pill (b) Slow release preparations i) Injectables : DMPA and NET-EN ii) Subcutaneous implants : Norplant iii) Vaginal rings **4.Post conception methods**	**3M**

		(a) Menstrual regulation (b) Menstrual induction **5.Miscellaneous methods** (a) Abstinence (b) Coitus interruptus (c) Safe period use method (d) Natural family planning method (e) Breast feeding method (f) Birth control vaccine **B) Permanent Methods** 1. Male sterilization (Vasectomy) 2. Female Sterilization (Tubectomy)	
4	**e)**	**Discuss Cardio-pulmonary Resuscitation (CPR).** CPR is most important lifesaving first aid procedure in patients whose spontaneous respiration has stopped and/or pulse is absent. CPR can be done by ABC Formula – where – A – stands for Airway Clearance B - stands for Breathing C – stands for Circulation or Cardiac Massage **1) Airway Clearance:** i)First of all the air passage should be opened and cleaned to make free passage of air. For this wrap a handkerchief of clean cloth on first two fingers of hand together and clean victims mouth carefully by turning the mouth of the patient to one side. to remove debris, impurities or secretions so as to prevent blocking airway. ii) Tilt the head back and lift the chin to bring it forward which prevents obstruction of the airway by the tongue. **2) Breathing:** i) If breathing is stopped, mouth to mouth respiration i.e. artificial respiration is	**3M**

		given, after cleaning mouth. ii) First aider should pinch nose of patient tightly by one hand, breath in lungful of air and breath out entire air forcefully in patients' airway by tightly sealing mouth on patients' mouth. iii) Expansion of chest of patient by 2-5cm should be observed that confirms air entering in to victim's lungs. iv) For adult patient such 12 mouth to mouth breathing are given per minute. v) In case if victims' mouth cannot be opened due to any reason, mouth to nose artificial respirations should be given by placing mouth on victims' nose. **3) Circulation or Cardiac Massage:** i) If patient's pulse is missing, to revive working of the heart, chest massage is given. ii) It is performed by pressing hard with both hands on victims' chest, two fingers above the lower end of sternum. iii) First aider should exert pressure by heel of hands keeping hands exactly perpendicular to patients' chest i.e. area of compression. iv) Pressure applied should be sufficient so that chest gets pressed by 1.5 to 4 cm. v) Such chest massage is given 60-80 times per minute continuously.	
4	**f)**	**Define Immunity. Classify it.** **Definition: (1 mark)** Immunity is defined as "ability to produce and possess specific protective antibodies or the cellular mechanism, as a result of previous infection or immunization or body conditioned so by such previous experience as to respond sufficiently to prevent infection or clinical illness or both, after exposure to a specific infectious agent". OR The power of the body to resist the effects of invasion of pathogens is known as immunity	**3M** **(1+2)**

		Classification of immunity: (2 marks)  	
5		**Attempt any FOUR of the followings**	**12M**
5	**a)**	**Discuss various methods of small scale purification of water (Any 3 methods to be discussed)** **Small scale purification of water :** Four different methods are generally available; these Methods can be used alone or in combinations. **a) Boiling:** Boiling the water for 5 to10 min is satisfactory method for purifying water for household purposes. It kills bacteria, spores, cyst, ova and yields sterilized water .It also removes temporary hardness. Water should be boiled preferably in same container, in which it is to be stored to avoid contamination during storage. **b) Chemical Disinfection:** Bleaching powder OR Chlorinated lime:It has 33 percent of available chlorine. It is used to Disinfect water.The principle of chlorination is to ensure a“free” residual chlorine of 0.5mg/liter at the end of one hour contact.	**3 M**

		Other agents used: chlorinated solution, chlorine tablets (halozone), high test hypochlorite(HTH) which is calcium compound called as perchloron, containing 60-70%available Chlorine, Iodine, Potassium permanganate: **c) Filtration:** Household water can be purified with the help of ceramic filters like Pasteur Chamber land filter , Berkefeld filter and Katadyn filter .These filter candles usually remove bacteria found in drinking water but not viruses. Apart from candle filters, on-line filters with bacteria retentive capacity are available which may be incorporated in water line or fitted to tap. **d) Disinfection of wells:** Wells are the main source of water supply in rural areas. The most effective and cheapest way of disinfecting well is by bleaching powder .	
5	**b)**	**Write Disinfection procedure for** **i) Room: (1.5 marks)** The floors and hard surfaces of the rooms can be disinfected with chemical agents like phenol , formalin bleaching powder etc., **ii) Sputum Disinfection: (1.5 marks)** a. Sputum is collected in paper cups and disinfected by burning in case when amount is small. b. Sputum in large amount is disinfected by boiling under pressure 20 lbs for one or one and ½ hrs and then is buried. c. Readymade paper cups can be given carrying 5% cresol solution to spit sputum in to it and after 2hrs.contact period and then cups are buried. or disposed by burning.	**3M** **(1.5+ 1.5)**
5	**c)**	Write function and deficiency disease of: **(i) Calcium** :**(1 mark for any two functions and 0.5 mark for deficiency)** **Functions** 1.It is necessary for growth of bones and teeth. 2.It is required for the clotting of blood. 3.It regulates the contraction of muscles.	**1.5 + 1.5**

		4.It is required for cardiac action production. 6.It forms a component of several enzyme. **Deficiency** of calcium leads to Rickets in children and Osteomalacia in adults. It also leads to delayed blood clotting **(ii) Iron:(1 mark for two functions and 0.5 mark for deficiency)** **Functions** 1.It is necessary for synthesis of hemoglobin. 2.It is essential for the formation of various enzymes. 3.It is required for brain development and muscle activity . 4.It is needed for the regulation of body temperature. 5.It has central function in oxygen transport and cell respiration. **Deficiency** of iron leads to iron deficiency anemia,and decreased immunity.	

5	**d)**	**What are hospital acquired infections? Write prevention and control of noscomial infection.** **Hospital Acquired Infections: (1 mark)** Hospital-acquired infection or noscomial infection are used for infections developing in hospitalized patients, which were neither present nor under incubation at the time of their admission. **Control and Prevention: (2 marks for any 4 points)** To achieve this, a committee needs to be appointed in the hospital and they need to monitor following aspects on regular basis : i)Cleanliness in the hospital ii)Proper sterilization of instruments and maintaining aseptic conditions wherever required iii)Controlling overuse of antibiotics iv)Maintaining Health and hygiene of hospital staff v)Avoiding water ,food contamination vi)Proper isolation of infectious patients	**3 M** **(1+2)**
5	**e)**	**Name type of fracture and First Aid Treatment for fracture.** **Types of fractures: (1 mark)** a) Simple Fracture (Closed Fracture) b) Compound Fracture(Open Fracture) c) Complicated Fracture	**3M** **(1+ 2)**

		d) Comminuted fracture **First Aid Treatment for fracture: : (2 marks)** i .Control bleeding if any by applying pressure bandage. ii .Cover all wounds with sterile dressings. iii .Immobilize the fracture parts immediately by using bandages or splints.(It is a support for a broken bone like wooden plank, Cardboard, Metal etc.) iv .Immobilization is important to prevent pain,further damage, to support to tissues which are ordinarily supported by that bone and to accelerate rapid healing of that bone. v .During immobilization of broken bone use adequate padding in the natural hollows	
5	**f)**	**Give advantages and disadvantages of condoms** **Advantages of condom: (Any three)** 1) It is safe, cheap and effective method 2) It possesses minimal or no side effects. 3) Condom use does not require medical supervision 4) It prevents transmission of STDs,including that of HIV infection to the sexual partner . 5) easily available **Disadvantages of condom: (Any three)** 1) It may tear or slip off during sexual intercourse. 2)It may cause leakage problem leaving semen in vagina 3)It may interfere in sexual pleasure during intercourse 4)It is to be used regularly which requires constant motivation. 5) It may cause allergic reactions in some individuals having latex allergy	**3M** **(1.5+1.5)**

6		**Attempt any FOUR of the followings:(1 mark each for causative agent, mode of transmission, symptoms and control)**	**16M (4x4=16)**
6	**a)**	**TUBERCULOSIS** **Causative agent**: bacteria called *Mycobacterium tuberculosis*. **Modes of Transmission**: Air borne infection transmitted by droplet from sputum of Patient through coughing, sneezing and talking of the patient. **Symptoms:** 1.Cough for more than 2 weeks 2.Fever 3.Weakness 4.Loss of weight 5.Loss of appetite 6.Chest pain 7.Blood in sputum. **Control :** 1. Early detection of cases by identifying symptoms and by carrying out i)Sputum test ii)chest x-ray , iii) Mantoux test or other tests as per symptoms. 2. Preventive treatment with INH or INH plus ethambutol . 3. Combination treatment for complete duration. 4. Isolation 5.Immunization with B. C.G vaccine 6.Balanced diet and health education.	**(1+1+ 1+1)**
6	**b)**	**AIDS** **Causative agent :** Virus known as Human Immunodeficiency Virus (HIV). **Mode of transmission:** 1) Sexual contact 2)Transfusion of the infected blood 3) Through contaminated needles and syringes. 4)Trans-placental or vertical transmission i.e from infected mother to foetus	**(1+1+ 1+1)**

		Symptoms: i .Weight loss ii .Chronic diarrhea iii .Prolonged fever iv .Persistent cough v .Generalized pruritic dermatitis. vi .Recurrent herpes zoster infection. vii .Oropharyngeal candidiasis. viii .Generalized lymphodenopathy viii) Kaposi ' ssarcoma ,meningitis **Control :** 1.Screening of blood before transfusion 2. Screening of high risk groups like prostitutes and drug addicts. 3. Use of disposable syringes for injection. 4. Avoid indulgence in multiple sex partners, avoid oral , anal sex. 5. Use of condom. 6. Health Education.	
6	**c)**	**Cholera** **Causative Agent**: Vibrio cholerae. **Mode of Transmission**: 1. Spread is mainly by contaminated food,water,milk. 2. Human being is the only reservoir of cholera infection. 3. Immediate source of infection is the stools and vomitus of cases and carriers. **Symptoms:** Acute diarrhoea,vomiting,nausea,dehydration,weakness **Control:** 1.Early detection of suspected cases and bacteriological examination of stools for confirmation 2.Notification to the local health authority 3.Rehydration using ORS ,zinc and if required antibiotics 4.Disinfection of stools, Vomitus, clothes, bedding, rooms and utensils	**(1+1+ 1+1)**

		5.Sanitary measures like water control fly control and disposal of excreta 6. Prevention by cholera vaccine especially during fairs and festivals. 7. Health education stressing the importance of food hygiene personal hygiene and water hygiene. 8. Water and milk should be consumed only after boiling. 9. Fruits, vegetables should be thoroughly cleaned before use.	
6	**d)**	**Leprosy** **Causative agent**: Bacteria Mycobacterium leprae. **Mode of Transmission**: 1. Leprosy is mainly transmitted by direct or indirect contact of an infected patient. 2. Sometimes it is transmitted by droplet infection through nasal and oral secretion of the patient. 3. Through breast milk of lepromatous mother , **Symptoms:** Skin patches (lesions), partial or total loss of cutaneous sensation in the affected area, thickening of nerve, deformities of toes, fingers ,nose etc, cough and fever **Control :** 1.Detection of cases of leprosy and tracing the contacts especially children 2.Multidrug therapy for control and cure. 3.Prevention of contact between the patient and other normal persons, especially children. 4.Selective isolation or hospitalization of the patient showing acute reactions 5.Health education	**(1+1+ 1+1)**
6	**e)**	**Plague** **Causative Agent** : bacteria Yersinia pestis **Mode of Transmission:** Through infected rat fleas and .In later stage through droplet infection from infected patients **Symptoms:**	**(1+1+ 1+1)**

		Fever, chills,hedache, inflammation of lymphatic glands, Large bubos develop in groin,often in axilla or neck. Septicemia **Control :** 1. Early diagnosis and immediate isolation. 2.Notification 3. Proper disinfection and disposal of sputum of patient. 4.Use of antibiotic such as Tetracycline 5. Rodent control by DDT, BHC etc. 6.Vaccination	
6	**f)**	**Trachoma** **Causative Agent**: Chlamydia trachomatis **Mode of Transmission:** 1. direct or indirect contact of infected persons or through fomites like Infected finger, towel, kajal & surma. 2. Discharge of eye secreations 3.Swimming pool where water can get contaminated 4.Overcrowding spreads transmission **Symptoms:** Trachoma produces inflammation and scarring of the conjunctiva. This lead to inward deviation of eye lashes and lid margin. The eyelashes produce abrasion of the cornea This results in corneal ulcer. Ultimately it leads to blindness. **Control:** 1. Early diagnosis and treatment of cases. 2.Surgicalcorrectionofeyeliddeformities 3. Common use of eye cosmetics like should be done with precautions. 4.Health education and community hygiene plays an important role in prevention and Control of trachoma 5. Treatment with Tetracycline, Erythromycin.	**(1+1+ 1+1)**