D.S.I.

DEPARTMENT OF HEALTH, [MEDICAL EDUCATION AND INDIGENOUS MEDICINE] GOVERNMENT OF BIHAR, PATNA.

COURSE/CURRICULUM FOR 2 YEARS DIPLOMA IN SANITARY INSPECTOR COURSE

SCHEME OF EXAMINATION FOR DIPLOMA IN SANITARY INSPECTOR COURSE

First Year

THEORY				
Sl. No.		Subject	Full Marks	Pass Marks
1		Elementary Anatomy, food & nutrition	100	50
2		Elementary Microbiology, Physiology and Communicable diseases	100	50
3		Environmental Hygiene and food hygiene	100	50
		Total Theory Marks	**300**	**150**
PRACTICAL				
4	A.	Practical	100	50
	B.	Viva	40	20
		Total Practical Marks	**140**	**70**

Second Year

THEORY				
Sl. No.		Subject	Full Marks	Pass Marks
1		Public Health Administration, Vital Statistics, Minor Sanitary Engineering and P.F.A. Act.	100	50
2		Non-Communicable diseases, animal reservoir diseases and First Aid	100	50
3		Rodent control & Vector Control, Home Nursing, Insecticide and minor ailments	100	50
		Total Theory Marks	**300**	**150**
PRACTICAL				
4	A.	Practical	100	50
	B.	Viva	40	20
		Total Practical Marks	**140**	**70**

DEPARTMENT OF HEALTH, [MEDICAL EDUCATION, & INDIGENOUS MEDICINE]s GOVERNMENT OF BIHAR, PATNA.

2 YEARS DIPLOMA COURSE FOR SANITARY INSPECTOR

SYLLABUS/COURSES OF STUDIES FOR DIPLOMA IN SANITARY INSPECTOR COURSE

MANAGEMENT AND CONTROL.

1. Health Dept. Medical Education Govt. of Bihar, Patna provides a training course for Sanitary Inspectors under the direct control of the Addl. Director of Health Services, Bihar.
2. The Director / Addl. Director of Health Services, Bihar is responsible to the State Government for preparation of the scheme of training, regulations and syllabus for the examination, admission of students to the course of training and the general control of the training programme of the Institute.

LENGTH OF COURSE / CURRICULUM AND EXAMINATION SCHEME.

1. Every candidate shall be required to attend an approved course of study spread over a period of two academic years.

2. candidates are required to undertake the following courses of study .

a. 40 hours including 20 lectures on elementary Anatomy
b. 66 hours including 30 lectures on elementary physiology, food standards and nutrition.
c. 100 hours including 36 lectures on Elementary microbiology which includes, Bacteriology, parasitology, entomology and Helminthology of public Health importance.
d. 40 hours lectures on Minor ailments, first aid & home nursing.
e. 60 hours (lectures on communicable diseases).
f. 160 hours (lectures on Environmental Hygiene including 100 hours on minor sanitary Engineering.)
g. 30 hours including 15 lectures on vital statistics.
h. 60 hours on Sanitary law and Public Health Administration.
i. 24 hours including 12 lectures on principle of Bio-Chemistry specially Vitamins, Minerals, Trace elements and digestive end products.

3. **A.** Every candidate must produce evidence of having undergone practical training in all branches of work and duties of a Sanitary Inspector under the supervision of a recognized medical officer of Health Dept. during a period of at least 9 months, who shall certify that the candidate has familiarized himself with actual duties and has got instructions in the duties for not less than 320 working hours.

B. Every candidate shall be required to attend 30 practical demonstrations to be given by the medical officers of Health, Patna Municipal Corporation and District medical officer of Health, Patna.

C. In addition, candidate shall attend eight demonstration at the Industrial and other centers of Public Health Interest.

D. Candidate shall undergo intensive practical training in Rural Public Health work for atleast 4 weeks.

E. To comply with clause the following to be done.

a. Arrangements are made by the Institute with Medical Officers of Health in urban and rural areas, to comply with the above mentioned facts.

b. Arrangements are made to take the students on study tour in Industrial areas and other places of interest to comply with clause.

c. Candidate shall spend one month at Bikram field training centre (Patna) or at any other place to be arranged by the Institute.

EXAMINATION.

1. The examination will consists of two parts - Part I and Part II. These will be written, oral and practical. Part I examination will be held at the end of one year and Part II (Final) will be held at the end of two years of the course. There will be a supplementary Part I and a supplementary Part II examination as reqired.

2. No candidate will be allowed to sit for any part of the examination unless he has attended 75% of the lectures and the demonstrations.

No candidate will be allowed to sit in the Part II (Final) examination unless he has been duly declared to have passed the Part I examination.

3. A candidate who fails to pass the part I examination may not be allowed to continue his study for the Part II examination until he will be declared to pass the Part I examination. If he fails in any part of the examination is eligible to appear at the examination in the same paper and practical without attending any further lecture at the Institute

4. **The details of Part - I Examination as follows:-**

1st Paper	Elementary Anatomy, food & nutrition.	-	100 Marks
2nd Paper	Elementary Microbiology, Physiology and Communicable diseases.	-	100 Marks
3rd Paper	Environmental Hygiene and food hygiene	-	100 Marks
4th Paper	Demonstration and Practical Examination	-	100 Marks
Viva/Voce Examination		-	40 Marks

5. **The details of Part - II Examination as follows:-**

1st Paper	Public Health Administration, Vital Statistics, Minor Sanitary Engineering and P.F.A. Act.	-	100 Marks
2nd Paper	Non-Communicable diseases, animal reservoir diseases, First Aid.	-	100 Marks
3rd Paper	Rodent control & Vector Control, Home Nursing & Insecticide and minor ailments.	-	100 Marks
4th Paper	Demonstration and Practical Examination & Report writing.	-	100 Marks
Viva/Voce Examination		-	40 Marks

Great importance is given to practical knowledge such as a candidate should have required knowledge in the course of his training. A desirable high standard of the practical knowledge is required to satisfy the examiners in respects of the practical familiarity with work and duties of a Sanitary Inspector.

6. In order to pass the examination, a candidate must obtain atleast 50% Marks in each written, oral and practical examination separately.

A candidate who pass in all subject and obtain 75% of the aggregate marks in Part II (Final) examination in a single attempt shall be declared to have passed with Honours.

SYLLABUS
Part - I

ELEMENTARY ANATOMY

1. **The bony Skelton** - Name of bones and types-position in the body, Classification of bones, composition of joints etc.
2. **Muscular System** - Voluntary and involuntary, difference in their mode of action and position of important muscle in body, Anatomy of thorax and abdomen.
3. **The lungs and their passage.**
4. **The Heart - circulation of blood.**
5. **Blood and lymphatic system.**
6. **Mouth - teeth - intestinal tract.**
7. **Excretory system** - Skin, aweat, glands, kidney, bladder, uretha, general structure.
8. **Reproductive System** - Reproductive organs [Male & Female].
9. **Special Senses** - Eye, ear and nose.

ELEMENTARY PHYSIOLOGY

1. **Circulatory System** - Function of heart, blood vessels - systemic, pulmonary and portal circulation, blood pressure and pulse, composition of blood, and function, co-gulation of blood.
2. **Respiratory System** - Lungs and air passages, mechanism of respiration, interchange of gases, chemical changes in blood and air.
3. **Digestive System** - Salivary, gastric and intestinal digestion, glands associated with the digestion, absorption of food.
4. **Excretory System** - Function of kidneys, physical characters and composition of urine, function of skin.
5. **Muscular System** - Voluntary and involuntary muscles.
6. **Nervous System** - General plan with elementary knowledge and function of various regions of central nervous system.
7. **Special Senses** - Elementary knowledge of physiology of special organs - eye, ear and nose.

FOOD AND NUTRITION.

Food constituents and composition of various food articles, cooking and preservation of food - beverages - mineral contents - vitamins and their importance. Digestion, absorption and metabolism of carbohydrates, fats and proteins. Calories in common food stuffs and requirements, Nutritional disorders associated with carbohydrates, fats, protein and vitamins. Selection of optional diets. Adulteration of common food stuff and its recognition of food standard - its importance, diet survey.

ELEMENTARY MICROBIOLOGY.

1. Normal bacterial flora of body. Pathogenic organisms important from Public Health aspects, specially. Coli group, Enteric group, vibrio cholera, dysentery group, pasteurella pestis, diphtheria bacillus, tubercle bacilli, lepra bacilli, spirochetes and virus.
2. Elements of sanitary bacteriology
   a. Water
   b. Sewage
   c. Milk and food

d. Soil and excreta.

3. Diseases spread through food - Food poisoning.

4. Immunity - Natural and acquired.

5. Methods of collection and disposal of water , insects, rodents, helminthes etc. for laboratory examination.

6. Protozoa and Helminthes - Hookworm, roundworm, trichinella spiralis, tapeworm, entamoeba histolytica, giardia, malaria parasites, L. D. bodies.

7. Insects - Elementary facts regarding the life history of flies, mosquitoes, fleas, lies and ticks etc., and the methods employed in destroying these insects. Protection against bites of mosquitoes and other insects.

Part - II

ENVIRONMENTAL HYGIENE.

1. **Air ventilation and lightening** - The composition of air and the various causes of pollution. The principles of ventilation and simple methods of lightening and ventilation of rooms and building including schools, factories etc. measurement and calculation of areas, cubic space etc.

2. **Water** - The physical characteristics of good drinking water, sources of water and methods of supply, the various ways in which it may be polluted during collection, storage and distribution and the means for preventing such pollution. The pollution of rivers, lakes, wells and ponds, sources and dangers of pollution. Methods of purification
   a. Natural.
   b. Domestic.
   c. Municipal.

3. **Collection and disposal of refuse and excreta** - Scavenging and various system for dealing with trade and house, and other refuse. Methods of collection and disposal of night soil, privy urinals and latrines, types and construction.

4. **Septic Tanks** - Construction and proper location, water drainage system. A knowledge of various systems of drainage and their adaptability to a particular condition. Construction of drains, leveling and methods of drain testing. Sewage treatment and disposal.

5. **Disposal of the dead** - Supervision of ghats, cemeteries etc.

6. **Housing** - Planning and sites (aspects, characteristic and composition of soil), Alignment (spacing from adjoining house and street), areas of site to built upon, construction - types and materials.
   a. **Village housing** - Ventilation, lightening, damps, heating.
   b. **Facilities Available** - Water, latrines, animal sheds, court yards, drainage, Facilities for storage of grain, refuse disposal and removal.

7. **Food Sanitation** - Duties of Sanitary Inspector in relation to the characteristics of good food and bad food (including fish, vegetables, fruits, meat, poultry, provisions etc.). Food in relation

to communicable diseases :-

a. Milk and milk products.
b. Meat and meat products.
c. Markets - Fruits and vegetables.
d. Food dispensaries.

8. **Industrial hygiene and offensive trade** - Definition. Sanitation of factories, workshops etc. welfare of workers, safety of workers, industrial poisoning, industrial disease and occupational diseases, prevention of industrial hazards, nuisance created by dangerous and offense trade. Their abatement and control.

9. **School Sanitation** - Environmental hygiene in school, lightening, ventilation, water supply and latrines.

10. **Village and rural sanitation** - Selection of sites for village, lay out of buildings plots, road, open spaces, Sanitary plots, markets, school, public buildings, cleaning of bush from outskirts and around water points, construction of fields incinerators, fly proof pit. Borehole and dug well latrines, modified septic tank, latrines etc. simple methods of protecting streams, springs, wells, tanks and reservoir from pollution, purification of village water supplies, anti-mosquito measures. Methods of disposal of waste water - soak pits, dry wells, street drains. Compost pits, cow manure, street sweepings, other measures for health of the villagers. Provision of bathing places and cattle walking places.

11. **Fairs, Festival and Public Gatherings :-**

a. General :- Planning and allotment of space, food handling, handling of dispensaries, toilet arrangements, drinking water, collection and disposal of refuse (liquid, solid), sleeping accommodations for employees.
b. Food protection, arrangements for dish washing, protection against dust, flies, vermis etc.
c. Cleanliness.

12. **Inspection And Report Writing:-** Methods of inspection of buildings, dwellings, cooking shops, eating house, restaurants, godowns, shops stores, dairies, aerated water and ice-cream and ice factories, cowsheds, bakeries markets, slaughter house, workshop, stables and offensive trades and nuisances especially connected with trade and manufacture.

13. **Minor Sanitary Engineering:-**

a. Mathematics and mensuration:- Of triangles, rectangles, circle, and irregular figures. Measurement of areas and volumes.
b. General:- The use of drawing instrument, the use of scales. The reading of plans and sections. Chain surveying and the practical use and leveling instruments. The measurement of area and volumes including the calculation of small quantities of earth work, sonar, etc. Estimating for minor and temporary work.
c. Building:- the description of soil and strata best suited to the erection of building in respect of stability and healthiness of the surroundings created there on.
d. The necessity for foundation, their proper depth, etc, knowledge of the various building materials, such as bricks, stone, lime, surkhi, asphait paints, etc. quality and the possible influence of the atmosphere on them. Their auitability, use in various parts of a building. To distinguish between good and bad bricks, timber, lime, cement etc. the methods of ventilation applicable to Indian condition. Main details of construction of temperory

wards as gained from a study of plans. The area and cubic space required in ordinary and contagious wards. The details of design of latrines as gathered from a study of plans, permanent and temporary . details of night soil depots and a knowledge of method of trenching, covering etc.

e. The inspection of sources of supply and determination by inspection as to their suitability for domestic purposes. The proper construction of wells to prevent the inlet of surface polluted water. The calculation of the capacity of a well and the average supply of water to be obtained from it. Methods of filtering and purifying small qualities of water or of otherwise rendering it safe for domestic use. The methods of drawing sample of water for chemical examination from water taps , tanks and streams. Simple - methods of calculation of the discharge of small channels. Various methods of raising water use in India and the construction of the ordinary force pumps. The use and construction of small cisterns and tank for storage of water. The quantity of water necessary per head for a town population and for houses and other animals. The methods of driving tube wells, their use and the position in which they are likely to be suitable. Drilled well or bored well along with large diameter traditional well.

f. **Drainage** :- the materials used in drainage works. The use of drainage pipes, glazed and unglazed, bricks drains, syphon trapes, cesspools, septic tank, etc. the various methods of house and street drainage. the proper gradients for drains and varying sizes. The various methods of pipe jointing in close drainage and subsoil drainage. The various sub-soil water level and its effect on health. The method of excluding sub-soil water from area and space below ground level. The methods of flushing and cleaning drains and drain testing.

g. **Disposal of sewage etc.:-** Methods of sewage purification. The action of the septic tank , bacterial and other filters, and for land etc. The relation of the septic tank to the old cesspool. Simple plant for domestic sewage disposal. The formation of small collecting tanks and areas for sewage irrigation. The sub-soil drainage of sewage farms when necessary and when not. The maximum area which can be irrigated by any quantity of sewage, the maximum quantity of sewage, the maximum quantity of sewage which can be put in an area to insure a maximum return in relation to temperature and climate.

14. Public Health Administration

a. Back ground of administration/organization of Ministry of Health, State Health department and department of local bodies. Responsibilities of official health departments and general programmes-relationship of health agencies to other official departments e.g. Public works, labour education etc. and to voluntary agency/organizations. Types of personnel in local and State Health Department, their general responsibilities and their inter working relationship for Public. Specific duties and responsibilities of Sanitary Inspectors

b. **Maternity and Child Welfare** - Maternity and infant mortality and their causes. Maternity and child welfare schemes in towns and control. Clinics and welfare centres.

c. **School Health** - Organization of school health service, preventive measures, health education practices, physical education.

d. **Vital Statistics** - Its importance in Public Health, its value in studying trends of mortality from varius causes. Definition of rates and of the methods of calculating birth rate, death rate, infant mortality rate, morbidity rates, specific death rate, maternal mortality rate - expectation of life, importance of vital statistics to the national systems of registration of vital statistics in villages and towns - duties of various officers concerned in the registration of vital statistics and notification of epidemic diseases.

Defects of collection of vital statistics and how to remove them.

Graphic representation, enumeration and tabulation of data.

Forms and registers used in District Medical Officer of Health and Municipal Medical Officer of Health Office for statistical compilation.

e. **Sanitary Laws** - General Sanitary Laws with particular reference to Bihar Acts and India Govt. Acts.

Model By-Laws, rules and regulations relating to Public health and to the duties of Sanitary Inspectors. The principles and practice of administration and enforcement.

f. **Public Health Education:-** Place of Health education in total Public Health Programme - application of basic education principles, role of various organization in health education . Tools and techniques of health education. Need to measure effectiveness of Health education, work and field assignment.

Communicable disease commonly prevalent in India, special attention being given to cholera, enteric fever, dysentery, small pox, diphtheria, influenza, typhus, ankylostomiasis, Kala-azar, plague, tuberculosis, leprosy, malaria, filaria and general diseases. Only important features of other epidemic and Endemic diseases. Early manifestation and recognition, incubation period of communicability. Mathods of prevention and control. Investigation methos of isolation, disinfection-disinfectant. Vaccination, preventive inoculation. Isolation in hospitals. Resistance to communicable diseases, natural, acquired. Immunization-permanent or transitory building up of immunity by exposure. Personal protection

Characteristics symptome of non-infectious diseases, deaths from which have to be commonly recorded and could be recognized.

RODENT CONTROL

1. Types of rats and behavior.
2. Diseases transmitted by rats, mode of transmission.
3. Economic considerations
   a. Destruction of materials.
   b. Contamination food stuffs.
4. Rat catching, destruction, poisoning, trapping
   a. Seasonal.
   b. Temporary or intermittent (Drives).
   c. Continuous programme
5. Rat proofing-permanent - Stores, warehouses, homes etc.
6. Elimination of breeding places.
7. Rodenticides - Types and uses.
8.

VECTOR CONTRONL

1. Mosquito.
   a. Diseases transmitted - Causality etc.
   b. Survey methods
      i. Recording of species, housing, places, sheltering places.
      ii. Malarious, non malarious infection.
   c. General Education on mosquito control
   d. General measures.

i. Spraying, residual, sprays, surface etc.
ii. Larva control, spraying, ditching, drainage etc.
iii. Screening .
iv. Nets.

e. Insecticides and larvicides.
i. Types and usage of various aerosols etc.
ii. Methods of utilization of various solutions.

FLIES.

(1) Species – domestic, sand flies, biting flies.
(2) Relation ship to diseases.
(3) Aesthetic considerations
(4) Seasonal variations.
(5) Breeding sources and elimination of breeding places.
(6) Control measures.
(a) Natural means: cleanliness of premises, screening, ect.
(b) Insecticides and larvacides.
(c) Eliminations of breeding places.
(d) Effective attack on breeding places at proper period.
(7) Education of public.
(a) Demonstrations
(b) Visual aids.

LICE, FLEASE, TICKS, Etc.

1. Relation to disease.
2. Control measures
3. Mosquito Control.
4. Sand Fly Control.

ANIMAL RESERVOIRS OF DISEASE.

1. How transmitted
(a) Rabies - Dogs, cats, jackals, foxes, camels.
(b) Anthrax- cattle, hides, wools, slaughtering.
(c) Hydatid cysts, dogs, sheeps, oxen, cats.
(d) Undulant fever- cows, goats.
(e) Tuberculosis- cows, cattle.
2. Methods of control.
3. Immunization and other protective measure.
4. Testing methods of animals in control programmes.
5. Indiscriminate disposal of infected animals
6. use of infected animals for food
7. contamination of ground from infected animal, refuse of blood

FIRST AID.

1. Principle of first aid, Dressings & bandages.
2. Fracture & dislocation & Sprain
3. Wounds & Hemorrhages & Shock

4. Artificial respiration
5. Burn & scald
6. Insensibility, Examination of patient, Transport and care of patient.
7. Poisons, classification, signs & treatment
8. Stings, Snake, bite.
9. Foreign body in eye, ear, nose, & stomach.
10. Practical demonstrations and working.

HOME NURSING:

(1) Definition and principle.
(2) Sick room- location, requirements and care of the beds.
(3) General observation and nursing of sick persons.
(4) Drugs and diet therapy.
(5) Methods of treatment of infectious diseases.
(6) Care of wound and sepsis.
(7) Practical demonstration and discussion.

MINOR AILMENTS:

(1) Common diseases of eye, ear, nose, and throat, with their treatments.
(2) Abdominal discomfort.
(3) Diarrhea and Dysentery.
(4) Common skin diseases.
(5) Medicine boxes and their uses.

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