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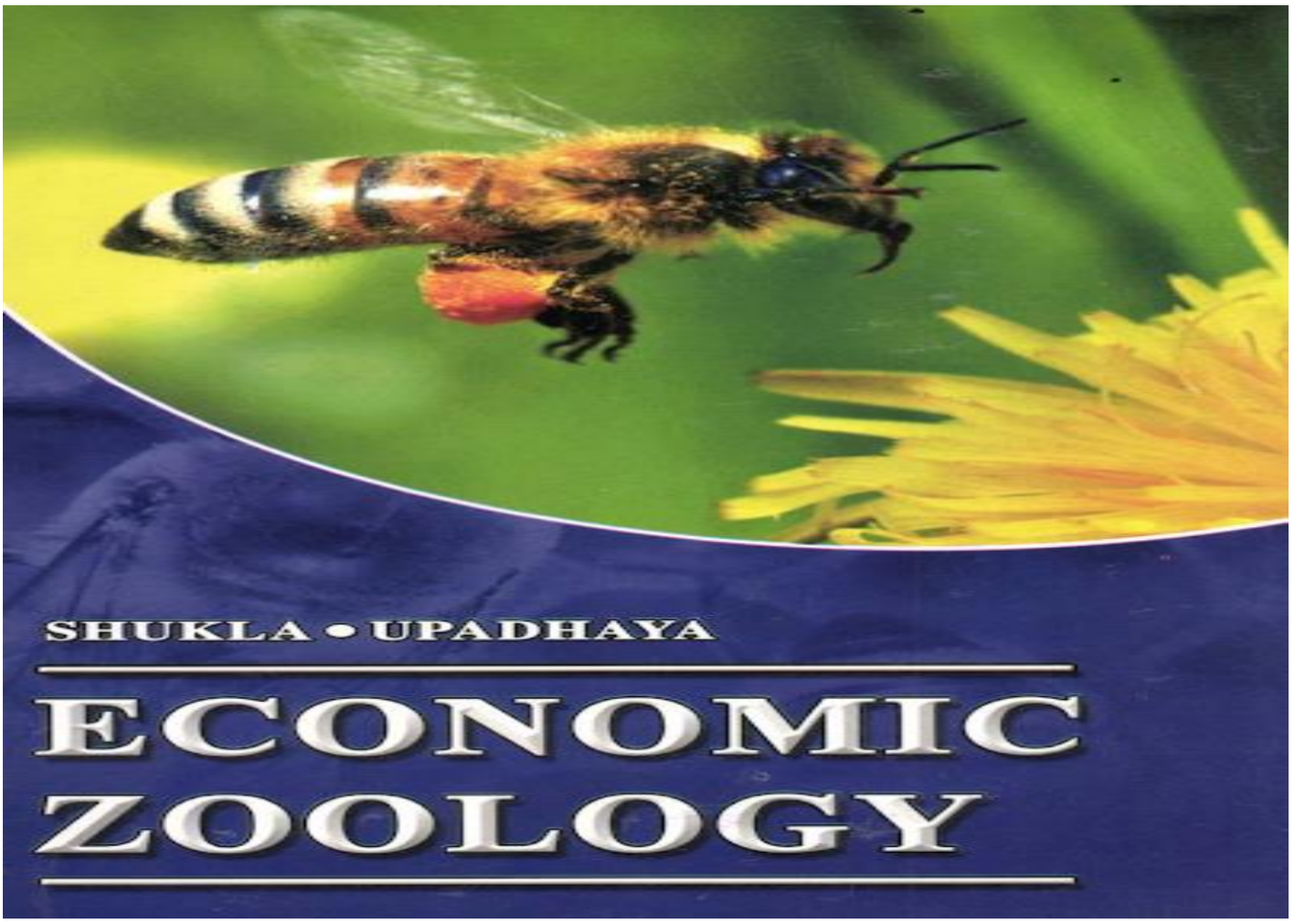
Federal Government University

Past -quiz /grand quiz/ mid term / final term /
Solved paper

World-Class Education at Your Doorstep

MSC-ZOOLOGY

ZOO510-Economic-Zoology



PAST PAPERS

MUHAMMAD IMRAN

MUHAMMAD IMRAN	ZOO510-Economic-Zoology
PAST MCQs	ALL IN ONE FILE

QUIZ NO 1	QUIZ NO 2	GRAND QUIZ	MID TERM	FINAL TERM





Quiz No. 1

1. Male Lac-insect the body is typically divided into head, …and abdomen. _____ **thorax**
2. Feeds should be stored in a ….and well-ventilated area. _____ **dry, cool**
3. …. a common methods of feeding fish. _____ **Hand feeding Is**
4. Bombyx mori Produces over …. of the world's raw silk. _____ **90%**
5. Blood poisoning due to bacteria is called…. _____ **Septicemia**
6. …. Causes disease in fish. _____ **Aeromonas hydrophila**
7. …. Causes disease in silkworm. _____ **Pebrine**
8. To produce 1 kg of lac resin, around …..insects lose their life _____ **300,000**
9. Spring Viremia of Carp is a …infection. _____ **viral**
10. Bombyx mori is an economically important insects being a primary producer of…_____ **silk**
11. Whirling diseased by_____ **Myxobolus cerebralis**
12. Aghani and baisakhi strain are the main corps contributing about …of lac production. __ **90%**
13. James I introduced sericulture to _____ **England America**
14. How many moles of oxygen are required to convert one mole of ammonia to nitrate?_____ **3**
15. Which of the trophic level is Most frequently used for breeding purposes _____ **Oligotrophic**
16. Commonly Cultured Crustaceans are _____ **all of the above**
17. Aquaculture is ….of aquatic organisms _____ **Farming**
18. Disadvantages of Rivers, lakes and streams _____ **excessive nutrients**
19. Feed Conversion of poultry is _____ **2.25:1**
20. …. Are used for Extraction of nutrients for vitamins _____ **Seaweed**
21. Raceways are made of _____ **concrete**
22. An independent ….for each pond if filled by tube well _____ **Electrical source**
23. Water sources for raceway aquaculture operations are_____ **All of the above**
24. According to American Cancer Association Regular fish consumption decreases chances of _____ **colon cancer**
25. Stratification can cause dissolved oxygen and temperature to very at different depths in the …. System _____ **same**
26. Black sea bass is an example of…. Commonly cultured fish specie _____ **Natural stock enhancement**
27. ….. is one of the oldest occupation_____ **fishes**
28. An Integrated Treatment must be _____ **All of the above**
29. Aquaculture prevalent in third world countries is _____ **Extensive Aquaculture**
30. Factors those dictate Classification of Culture Systems include _____ **ALL**
31. Nitrogen is an essential nutrient for all living organisms and is found in _____ **ALL**
32. NH3 is converted to NO3 by …process _____ **oxidation**

33. Red Drum is an example of…. Commonly cultured fish specie _____ **Natural stock enhancement**
34. In Pond Design Criteria Width of crown should be _____ **5 m (driving), 3m (walking)**
35. In Levee Pond Construction Depth should be …. in shallow end _____ **5 feet**
36. Which factor Major effect on the oxygen saturation level _____ **Salinity**
37. Induction air into water is called _____ **aeration**
38. NH3 exist in water in ….forms _____ **2**

GRAND QUIZ

1. NH3 forms are dependent on _____ **Both**
2. Commonly Cultured bait Fish species_____ **ALL**
3. Stripped Bass is an example of…. Commonly cultured fish specie _____ **Food fish**
4. industrialized Aquaculture are _____ **Intensive Aquaculture**
5. Which of the following is not a type of aquaculture systems?_____ **Fresh water culture**
6. In levee pond construction, maximum slope of levee should be._____ **4:1**
7. 5-7 acre watershed per surface acre of water is disadvantage of _____ **surface**
8. is a common method of feeding fish_____ **Hand Feeding**
9. Commonly cultured food fish species include, _____ **Catfish**
10. Rainbow trout feed conversion _____ **None**
11. First fish hatchery was in Oregon_____ **1877**
12. Construction of pands include? _____ **All**
13. Which of the following is not included in species selection? _____ **Yield control**
14. According to american cancer association regular fish consumption decreases chances of cancer by _____ **50%**
15. Farming implies some form of intervention in the rearing process to enhance production, such as _____ **All of the above**
16. …..impacts the rates of chemical and bialogical process at the most fundamental level ._____ **Temperature**
17. Economic zoology deals with animal world that is associated with the. ____ **All of the above**
18. Omege-3 fatty acids decreases occurrence of _____ **Heart disease**
19. ….is the old name marine or brackish water._____ **Mariculture**
20. Aquaculture encompass farming of aquatic organisms. Including ,_____ **All of the above**
21. in pond design criteria. Levees with slopes 1:2 for _____ **High clay**
22. causes disease in fish _____ **Aeromonas hydrophobia**
23. Species selection include? _____ **All**
24. If ponds must be drained to harvest (shrimp) then use one per acre of water_____ **10 inch**
25. in pond design criteria Slope to harvest basin should be. _____ **0.5-1.0%**
26. A process in which NH3 is converted to NO3 is known as _____ **Nitrification**
27. inhabiting macro and micro life Aquarium trade? _____ **live rock**
28. Low oxygen is disadvantage of _____ **Wells**
29. Which of the following specie(s) can be cultured in ponds? _____ **All**
30. First book on fish farming _____ **475 B.C**
31. Abalone are commonly cultured. _____ **Mollusks**
32. induction of pure oxygen is called _____ **Oxygenation**
33. High density aquaculture are _____ **Intensive aquaculture**
34. Who wrote first book on fish farming? _____ **None**
35. Beef cattle on feedlot feed conversion ratio is. _____ **8:1**

36. Watershed ponds Requires acres of watershed per acre of water _____ **5-7**
37. Compost is fertilizer. _____ **Organic**
38. In aquaculture there are. primary sources of nitrogenous wastes _____ **4**
39. Minimal control and lower density are_ _____ **extensive aquaculture**
40. In pond design criteria. Once formed, levees are sprigged with grass to erosion.__ __ **Reduce**
41. To produce 1 kg of lac resin, around insects lose their life_____ **300,000**
42. Stocking density is fish ….per acre._____ **800-1000**
43. Dissolved oxygen and water temperature usually very over a hour cycle._____ **24**
44. 3 species culture include. _____ **All**
45. is a disease of silkworms_____ **Pebrine**
46. Which of the following filters are used with various mesh screens. _____ **Screen filters**
47. in outgoing bio filter water not less than, ppm._____ **2**
48. Which of the following is considered as disadvantage of surface? _____ **Contaminates**
49. In fish tank O2 should not be less than ppm._____ **5**
50. Which of the following describes the bulk of high-density production systems where risk and economics must be carefully balanced to achieve profitability _____ **Mesotrophic**
51. In pond design criteria Heights are determined by pond. _____ **Both**
52. Mechanical filtration include? _____ **Both a&b**
53. is/are highly soluble in water. _____ **All**
54. Semi closed system water reuse rates are_____ **50%**
55. Construction of ponds include? _____ **All**
56. are used for extraction of medicines. _____ **All**
57. An independent for each pond if filled by tube well. _____ **Electrical source**
58. Which of the following parameter is/are considered to design aquaculture _____ **All**
59. levee pond construction, minimum slope of levee should be._____ **3:1**
60. In ponds construction.number/size of gates depends on of harvest required _____ **Speed**
61. Levee pond width should be._____ **20 ft**
62. Carp were farmed in China as early as _____ **2500 BC**
63. needed for egg production & hatchability_ _____ **Mn**
64. Commonly cultured ornamental fish species are. _____ **Backyard Bands**

Quiz No. 2

1. At an age of 10-12 weeks cocks are separated from …_____ **hens**
2. ….. is the first limiting AA for egg production in laying hens_____ **methionine**
3. Geese will start to eat pasture when they are only …old _____ **few days**
4. The color of egg yolk depend upon the presence of _____ **carotenoid**
5. Very hot weather causes ..quality egg shells _____ **poor**
6. formulating poultry diets …. is the most common grain _____ **Corn**
7. In turkeys sticky droppings adhere to the feet & cause dermatitis_____ **Footpad dermatitis**
8. In feeding of broilers starter ration contains ….. % protein. _____ **22-24**
9. inflammation of tongue & mouth cavity (black tongue) caused by _____ **niacin**
10. Deficiency of niacin, biotin, Vit E & zinc causes _____ **Enlargment of hock joint**
11. For egg production.....is first limiting AAs_____ **Methionine**
12. Chickens bred for meat production….. grow and achieve adult stage much early_____ _____ **rapidly**
13. Period after ….. of age hens attained mature body weight. _____ **42w**
14. Drying and exposure to..... are very effective in killing many disease causing organisms._____ **sunlight**
15. is the most common grain used in formulating poultry feeds _____ **corn**
16. Inorganic…. is supplied by bone meal, di-calcium phosphate, and rock phosphate in poultry feeds_____ **phosphate**

17. in poultry feeding some medicines are administered in the....._____ **water**
18. Deficiency of in the ration of laying hens cause goiter,_____ **Iodine**
19. Sources of…. in poultry diets are ground oyster shell, limestone, bone meal, and di-calcium phosphate,_____ **Ca**
20. if a commercial feed for ducks & geese is not available… feed may be used ____ **Chicken**
21. Laying hens (2kg wt.) requires..... Kcal energy for their maintenance_____ **220**
22. Animal protein sources are more variable in their amino acids than….protein _____ **plant**
23. Young chick requires more niacin than….. due to less bacterial activity _____ **adult**
24. ….is the most common grain used in formulating poultry feeds _____ **Corn**
25.
26.



1- ….is farming of aquatic organisms in natural or controlled marine or Fresh water environment. _ ____ **Aquaculture**
2- RAS stands for._____ **Recirculating aquaculture system**
3- Induction air into water is called .._____ **Aeration**
4- Transformation from soft, dusty mixture to compact form is._____ **Pelleting**
5- fungi are._____ **multicellular**
6- Most common feeding method for fishes is._____ **Hand feeding**
7- Bombyx mori produces.._____ **Silk**
8- bombyx mori produces ...-.. percent of the worlds raw silk _____ **90%.**
9- In..... Lac insect is known to have two distinct strains: kusumi and rangeeni. _____ **india**
10- The life cycle of lac insect takes about..... Months _____ **6**
11- Mature male chicken is called. _____ **Roaster**
12- The lac which grows on non-kusum plants is called as.._____ **Ranjeem lac**
13- India alone accounts for about ... percent of global lac production. _____ **70%**
14- QMP stands for.._____ **Queen mandibular pheromone.**
15- .....is a farming of chicken, turkey, duck and goose. _____ **poultry**
16- Raceways are considered.._____ **Flow through systems**
17- .....is a silkworm disease _____ **Pebrine**
18- Aghani and baisakhi strain are the main crops contributing about..... Percent of lac production. _____ **90%**
19- Lac cultivation is introduced into..... From India. _____ **Thailand**
20- a group of chicken is called ……._____ **flock**
21- Trained staff called …….'catch the birds and put them in special containers called ……. _____ **catchers' .modules.**
22- life of worker bee is _____ **28 to 35 days.**
23- Carnivorous fish consume foods with …..of protein ._____ **~50%**
24- The place where a beekeeper keeps his bees is called an _____ **apiary or a bee yard.**
25- Typically ….. pipe is sufficient for ponds less than 10 acres . _____ **6 inch**
26- Whirling disease Caused by. _____ **Myxobolus cerebralis**
27- Mulberry culture spread in India by 140BC from _____ **China**
28- The common parasites of lac insect are known as_____ **"Chalcid."**
29- A virus is a _____ **microscopic organism**
30- American Cancer Association Regular fish consumption decreases chances of colon cancer_____ **50%**
31- Unsaturated FA = _____ **double bonds**
32- James I introduced sericulture to ….He also took sericulture to.. _____ **England America.**

33-Female lac insect is …than male. _____ larger

34- …(blood poisoning due to bacteria. _____ Septicemia

35-a parasite which lives inside the host is an _____ endo parasite.

36- Spring Viremia of Carp A …..caused by Rhabdovirus carpio. _____ viral infection

37-To produce 1 kg of lac resin, around …insects lose their life. _____ 300,000

38-….caused by fish disease. _____ Aeromonas hydrophila

39-Feeds should be stored in a ….area . _____ dry, cool and well-ventilated

40-Male Lac-insect: The body is typically divided into head, …and abdomen. _____ thorax

41-….were used as one of the first forms of aquaculture. _____ Ponds



1. _____ is the largest aquaculture producing country in the world. _____ China
2. _____ were used as one of the first forms of aquaculture. _____ Ponds
3. CO can be removed by trickling filter by keeping gas/liquid ratio of_____. _____ 5:1
4. Which one of the following is the Vitamin is water soluble? _____ Vitamin B
5. Whirling disease is caused by the_____. _____ Protozoan
6. Which one of the following is included in silkworm disease? _____ Perrine
7. In_____ Lac insect is known to have two distinct strains, Kusuma and Range Eni. _____ India
8. The common parasites of lac insect are known as_____. _____ Chalcid
9. Chicken, turkey, duck and goose are all types of birds and they are reared for meat is called_____. _____ Poultry
10. A group of chickens is called a_____. _____ Flock
11. A group of baby chickens is called a_____. _____ Peep
12. _____is first limiting AAs for egg production. _____ Methionine
13. If a commercial feed for ducks & geese is not available ___ feed may be used. ____ Chicken
14. Which one of the following is not an infectious agent? _____ Physical
15. Fowl pox vaccine at _____ weeks of age. _____ 4-6
16. Which one of the following is livestock selection based? _____ Based on performance of ancestors
17. The total amount of feed an animal has in a _____ period. _____ 24 hours
18. Which is the by-product of Corn having residue? _____ Removal of Starch
19. _____ high stocking rate of animals are put into a pasture for a limited period. _____ Strip Grazing
20. Which statement is true about the Biological Control? _____ Avoid broad-spectrum insecticides
21. Humidity, temperature, air movement, water and light are the _____ factor. __ Physical
22. Commercial feeds in …form available for ducks & geese __ mash, pelleted or crumbles
23. Performance of livestock is based or efficiency of production which is the ability to utilize feed efficiently, _____ in producing meat, milk, wool or power.
24. …Should be fairly fine-chopped to ensure packing _____ Corn Stover (Stalklage)
25. ….Major Pest Categories . _____ Four
26. Complex learning (intelligence) . _____ genetics
27. The color of egg yolk depend upon the presence of carotenoid pigment (…) in the ration _____ xanthophylls
28. Fowl pox vaccine at **4-6 weeks** of age ➢ Second dose at 12-**14 weeks** of age.
29. Evaluating Hay Quality involved _____ Odor and Condition
30. rape, turnips, or summer grasses example of _____ Strip Grazing
31. Ticks sense …warmth and movement from animals _____ CO_2,

32. Intensive pesticide use kills susceptible …in a population, leaving some resistant ones to reproduce _____ **pests**
33. …aphids per wheat plant = no problem - no action _____**6**
34. Making good Silage moisture range target . _____ **50-70%**
35. ……: def. Of niacin, biotin, vit.E & zinc._____ **Enlargement of hock joints Cause**
36. …is needed of egg production & hatchability. _____**Maganese**
37. ….is first limiting AAs for egg production. _____ **Methionine**
38. When …is found to be not up to standard, it may be rejected by the creamery._____ **miks**
39. Mesogenic strain (R2B) for the treatment of ranikhet disease useful at the age of _____**6-8 weeks of age.**
40. Which one is the Lab Animals -_____ **Mice**,
41. Good Biosecurity Practices should Reduce exposure form. _____**All the above**.
42. Staphylococcus bacteria causes. _____**BUMBLE FOOT**
43. The milk of the …has the highest butterfat and SNF content of any co_____ **Jersey cow**
44. Fat Soluble Vitamin _____**A**,
45.

MUHAMMAD IMRAN

ZOO510-Economic-Zoology | MID TERM SOLVED PAST PAPER

1. Economic zoology

Economic Zoology is a sort of applied **zoology**, which involves the study of animals / living organisms that are of benefit or those that cause harm to humans.

1. Tip's for the safety of bee keepers

Bees can be dangerous; a beekeeper must take several safety precautions when working around a honey bee colony.

- ✓ A hat or veil is commonly used to keep the face and neck protected from stings.
- ✓ Gloves are another popular form of beekeeping protection, although many beekeepers complain that gloves restrict their movement.
- ✓ A hooded suit, typically made from a light colored fabric to help distinguish the beekeeper from the honey bee's natural predators, may also be used.

While working with a honey bee colony, a beekeeper uses a smoker to help calm the bees

- ✓ Smoke is useful in beekeeping because it masks the guard bee's alarm pheromones and encourages the other bees to feed by tricking them into thinking they'll soon need to abandon their hive.
- ✓ The smoke gives the beekeeper enough time to inspect the colony and perform any needed maintenance.
- ✓ I use Pine needles for fuel in my bee smoker.

2. Type of fish Feeds

- ✓ Finely ground meals
- ✓ Crumbles
- ✓ Flakes
- ✓ Pellets of various size & density
  - Sinking
  - Floating
  - Slow sinking
- ✓ Microdiet

3. Define fungus?2

Fungus are multi-cellular, spore producing organisms that live off **other** organisms, and dead matter, some are parasitic. Fungal spores are commonly found in aquarium water

4. Define pullet? 2 "Young, immature female chicken less than 5-6 months of age"

5. Bombyx mori Characteristics

- ✓ It cannot fly
- ✓ Caterpillars with no real locomotion
- ✓ Female larger than male
- ✓ Male has big plumose antennae

6. Commonly cultured fish name? 5.



7. Technique of lac culture? 3

Lac is a natural resin of animal origin. It is secreted by an insect, known as lac-insect in order to obtain lac, these insects are cultured and the technique is called lac-culture.

8. Protein requirements for fish? 3

- ✓ Fish contain 60-93% crude protein, thus, fish diets are higher in protein than birds & animals.
- ✓ Fish appear to be relatively efficient utilizer of protein to energy with 84%.
- ✓ Fish can not synthesize their amino acids & obtain chiefly from the diet & absence affects growth of fish

9. Composition of lac.

Lac is a mixture of several substances, of which resin is the main constituent. The approximate **percentage of different constituents of lac is given below:**

- ✓ Resin – 68 to 90%
- ✓ Dye – 2 to 10%
- ✓ Wax – 5 to 6%
- ✓ Mineral matter – 3 to 7%
- ✓ Albuminous matter – 5 to 10%
- ✓ Water – 2 to 3%

10. Spring viremia crops.

Cause

- ✓ A viral infection caused by *Rhabdovirus carpio*. **Symptoms**
- ✓ Darkening of skin, pale gills, pop eye, protruding vent, bleeding in gills skin and eyes.
- ✓ Lethargy, abnormal swimming positions, sitting on bottom of the tank.

Treatment ✓ No known treatment .

11. Guard bees and soldier bees.

Guard Bees - protect the entrance of the hive from enemies.

Soldier bees - Soldiers hang around near the entrance and attack invaders. They work in concert with entrance guards.

12. Plumage.

Plumage: Feathers of a bird.

13. What is virus?

A virus is a microscopic organism that can only reproduce by inhabiting host cells and using the genetic material in the cells of a host.

14. What is hatchery?

The eggs are incubated at the hatchery. They are kept warm, until the chicks start to hatch out of their shells. Chickens hatch at around 20 days and turkeys hatch at around 27 days.
Baby chickens are **called chicks.** Baby turkeys
are **called poults.**

15. Oligotrophic & eutrophic.

Oligotrophic

- ✓ Excellent water quality
- ✓ Very Clear
- ✓ Used in display aquaria
- ✓ Most frequently used for breeding purposes
- ✓ Some species are kept in these conditions all of their lives, while others for a period of time

Eutrophic

Exist for the grow out of the most tolerant species that show vigorous growth under moderately deteriorated water quality conditions

- ✓ Dissolved oxygen levels- economic optimum level
- ✓ Ammonia & Nitrite – less than 2mg-N/L
- ✓ Water quality – marginal

Species evolved under similar natural conditions prosper in these conditions

16. What is difference between intensive and extensive aquaculture.

Extensive Aquaculture: Minimal control, lower density • E.g., ponds, prevalent

in third world countries

Intensive Aquaculture: Highly controlled, high density, RAS, raceways, confined

• E.g. industrialized .

17. What is fish health.

- ➢ Health or well being important for
- ➢ feeding
- ➢ Growth
- ➢ Reproduction
- ➢ Diseased fish results in poor growth and ends up in losses
  - ▪ Further when diseased fish is sent to consumer, it changes
  - ▪ Texture
  - ▪ Appearance
  - ▪ Taste

18. Abdominal capacity of a hen is measured and expressed

Abdominal capacity of a hen is measured and expressed by ones fingers width.

Normal- 3 fingers width by 4 fingers width

19. Stages of insects

The Life cycle of lac insect takes about **six** months and consists of stages:

1) EGG
2) NYMPH
3) INSTARS
4) PUPA

5) ADULT

20. Whirling disease

Myxobolus cerebralis

• Caused by protozoan Skull

deformation from

21. How we Determine water quality

Testing Water Quality **Water quality parameters often tested are:**

a) Dissolved oxygen **e)** Nitrite/Nitrate
b) Water temperature **f)** Alkalinity/Hardness
c) pH **g)** Salinity
d) Total Ammonia Nitrogen

22. Mineral Requirements of Fish

- Fish have the ability to absorb a number of minerals directly from water ➢ reducing mineral requirements in the diet.
- Fish require all macro-and micro-elements required by other animals for enzymes & cofactors.
- Fish in soft water (low mineral content) require additional supplements in diet.

23. Bee sting reaction.

Normal Reaction

- ► Pain
- ► Wheal(swelling) develops at puncture site
- ► Redness develops around wheal
- ► Swelling
  - a little at site
  - a lot at site (large local)
- ► Itching

Allergic Reaction

- ► widespread, rapid swelling
- ► itching of body
- ► disorientation feeling
- ► stomach upset
- ► Loss of consciousness

24. Define swarming 2

Lac larvae begin to wander in search of suitable center to fix them. This mass movement of larvae from female cell to the new off-shoots of host plant, is termed **as "swarming".**

Lifecycle of lac insect

Swarming occurs after the emergence of nymph and it may continue for 5 weeks.

25. Use of Lac:

- Lac has been used for the welfare of human beings from the great olden days
- No doubt the development of many synthetic products have made its importance to a little lesser degree, but still it can be included in the list of necessary articles.
- Lac is used in making toys, bracelets, sealing wax, gramophone records etc.
- It is also used in making grinding stones, for filling ornaments, for manufacturing of varnishes and paints, for silvering the back of mirror, for encasing cable wires etc.,
- Waste materials produced during the process of stick lac is used for dying purpose. Nail polish is a good example of the by-product of lac.

26. artificial and natural infection.

Natural inection.

When infection from one plant to other occurs by natural movements of insect, it is called natural infection. This may be due to overcrowding of insect population and nonavailability of tender shoots on a particular tree.

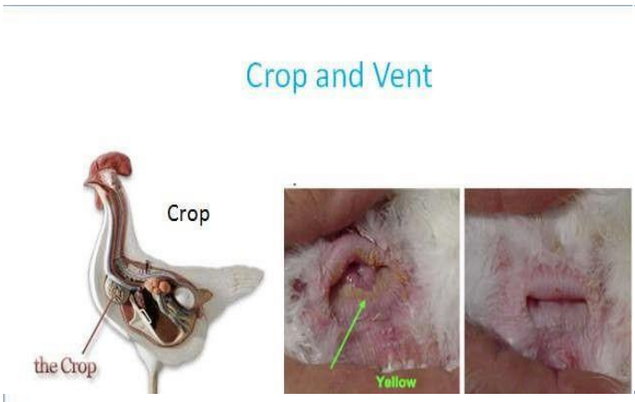
Artificial infection takes places through the agencies other than those of nature. Prior to about two weeks of hatching, lac bearing sticks are cut to the size of six inches. They are called "**Brood lac".**

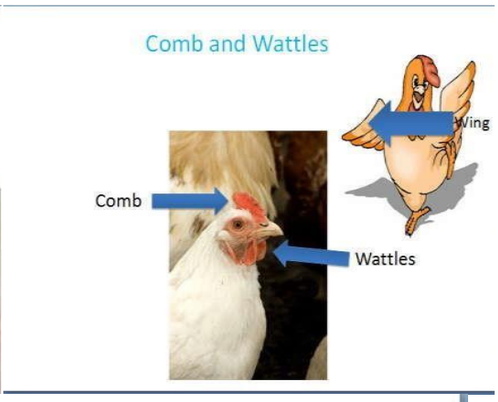
27. Types of aquarium system.

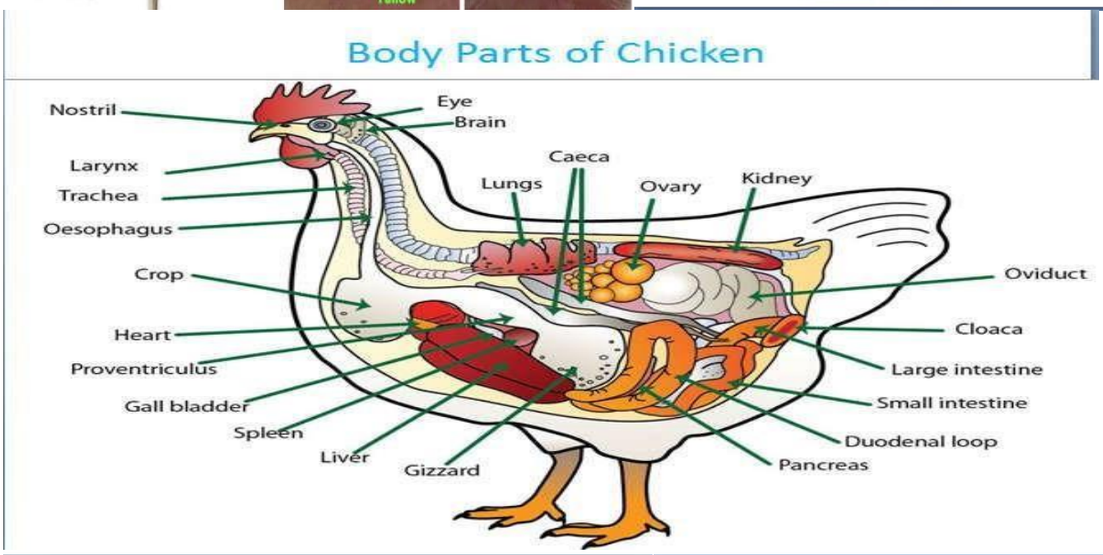
28. Culture of Effluent tank.

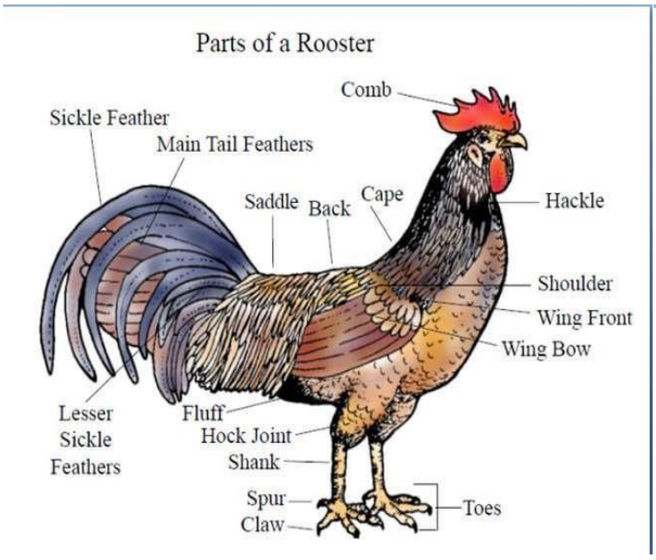
- High concentrations of suspended ○ and dissolved solids
- High ammonia levels and high concentration of CO_2
- Low levels of dissolved oxygen
- Application of Recirculation system
- Brood stock maturation
- Nursing and Larval rearing systems
- Nutrition and health research systems
- Short-term holding systems
- Ornamental and display tanks
- High density grow-out of food fish

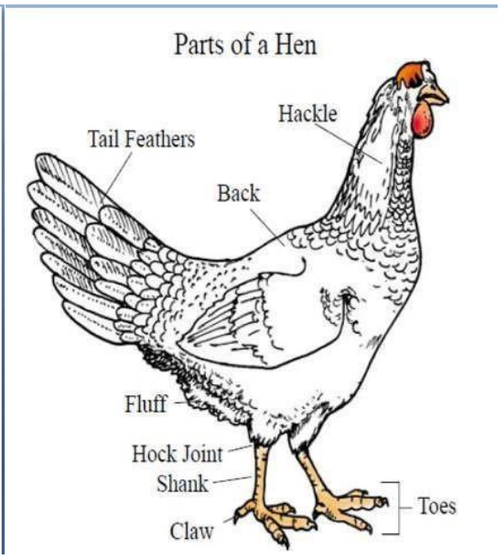
29. Name Different parts of chicken 5











30. Broiler/Flyer:

Chickens grown for meat production

31. Species cultured in ponds

- Rohu *Labeo rohita*
- Morakhi *Cirrhinus mrigala*
- Catla/Thaila *Catla catla*
- Grass carp *Ctenopharyngodon idella*
- Silver carp *Hypophthalmichthys molitrix*
- Big head carp *Aristichthys nobilis*
- Common carp *Cyprinus carpio*
- Tilapia *Oreochromis niloticus*

32. Functions of fat:

- 1-Providing energy
- 2-Cushions for vital organs
- 3-Energy reserves
- 4-Insulators & lubricants
- 5-Transports of fat-soluble vitamins

33. White Spot Disease itch.

Causes

Protozoan parasite either free swimming in the water or carried in with new fish or plants. Fish under stress from bad water conditions are more susceptible. **Symptoms**

- The fish's skin and fins are covered in tiny white spots A badly

affected fish may make rapid gill movements.

34. Define Catching

- Once the birds reach their required weight they are transported to the processing plant.
- Trained staff called 'catchers' catch the birds and put them in special containers called modules.
- Catching is carried out quietly and with care to avoid unnecessary stress and to prevent injury to the birds

35. Difference between queen and drone bee.

The Queen

- The queen is the only sexually developed female in the hive.
- She is the largest bee in the colony.
- A productive queen can lay 2,000 eggs in a single day.

The Drone

- Drones are stout male bees with large eyes and no stingers.
- Drones do not collect food or pollen from flowers.
- Their sole purpose is to mate with the queen.
- They die upon mating.
- If the colony is short on food, drones are often kicked out of the hive.

36. Factors affecting the requirements of protein

a) More Waste Limited Digestion
b) About 36% of feed is excreted as organic waste
c) Live fish biomass = 5x more waste than human
d) Why?

i. Limited digestion **ii.** Large fraction of feed remain undigested & is excreted .

37. Advantage and disadvantage of *Hand feeding* method

- Feed is distributed by hand, shovels, or other non-automated means.
- Most common method.
- Used for feeds not suited for automated systems.
- Meat scraps are hand fed.

Advantages:

1-Operator can note feeding behavior gauge the feed required 2Operator can ensure

that feed is dispersed over wide area.

Disadvantages:

1-high labor cost

2-increased handling of the feed.

38. What is raceway 2

Raceways are considered flow through systems. Being simple to construct they are some of the oldest designs in aquaculture. Water sources for raceway aquaculture operations are usually streams, springs, reservoirs or deep wells.

39. **Apiary.**

The place where a beekeeper keeps his bees is called an apiary or a bee yard.

40. **Difference between demand and anger feeder.**

a. ***Demand feeders***

- Allow fish to bump a rod and release feed when they are hungry.
- Used in raceways.
- Fish must be trained how to use them.

Fish can obtain food on demand by depressing a trigger.

- ***Auger feeding***

- Similar to systems used by swine and itry farmers.
- Feed stored in large tanks
- Moved by augers that drop feed in pond
- Common in tanks and raceways

41. **Importance of lac**

with increasing universal environment awareness, the importance of lac has assumed special relevance in the present age, being ***a)*** An eco-friendly ***b)*** Biodegradable ***c)*** Self-sustaining natural material

Since lac insects are cultured on host trees which are growing primarily in wasteland areas, promotion of lac and its culture can help in eco-system development as well as reasonably high economic returns. It is a source of *livelihood* of tribal and poor inhabiting forest and subforest areas.

42. **Inoculation:**

The method by which the lac insects are introduced to the new lac host plant is known as **inoculation.**

43. Ari lac and Phunki lac

Lac can be scraped from the twigs before or after the emergence of larvae. If it is used for manufacturing before the emergence of larvae, the type of lac produced is called as "**Ari lac"** and
if it is used for manufacturing purpose after swarming of larvae has occurred, the lac is said to be "**Phunki lac".**

44. Fat soluble and vitamins

Table 3. Vitamins and some of their major functions as established in fish.

Fat-soluble vitamins	Function
vitamin A, retinol	epithelial tissue maintenance, vision
vitamin D, cholecalciferol	bone calcification, parathyroid hormone
vitamin E, tocopherol	biological antioxidant
vitamin K	blood clotting
Water-soluble vitamins	
thiamin, B_1	carbohydrate metabolism
riboflavin, B_2	hydrogen transfer
pyridoxine, B_6	protein metabolism
pantothenic acid	lipid & carbohydrate metabolism
niacin	hydrogen transfer
biotin	carboxylation & decarboxylation
choline	lipotrophic factor, component of cell membranes
folic acid	single-carbon metabolism
cyanocobalamin, B_{12}	red blood cell formation
ascorbic acid, vitamin C	blood clotting, collagen synthesis
inositol	component of cell membranes

45. Guard bee and solider bee.

Guard Bees - protect the entrance of the hive from enemies.

Soldier bees - Soldiers hang around near the entrance and attack invaders. They work in concert with entrance guards.

46. Spring Viremia of Carp

Cause

a. A viral infection caused by *Rhabdovirus carpio*.

Symptoms

Darkening of skin, pale gills, pop eye, protruding vent, bleeding in gills skin and eyes.

Lethargy, abnormal swimming positions, sitting on bottom of the tank.

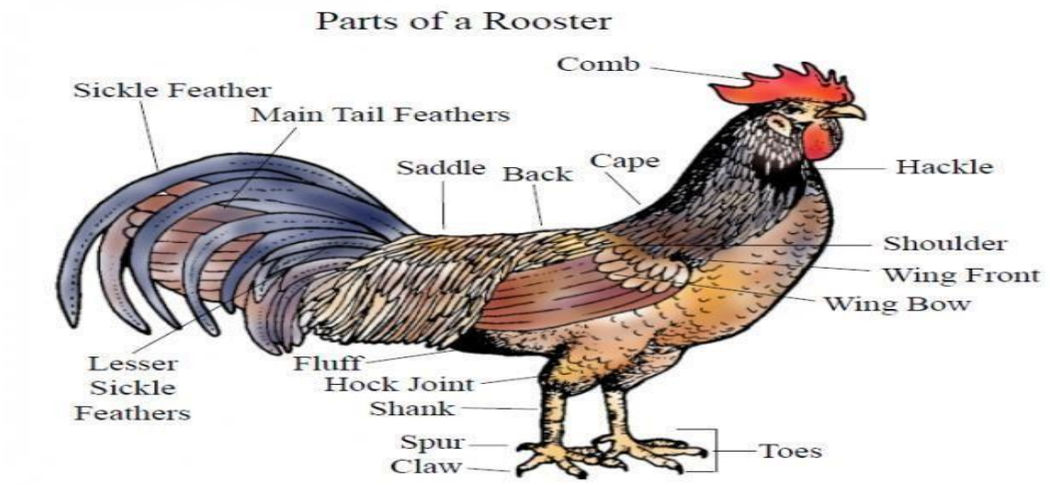
Treatment

b. No known treatment .

47. Aquaculture Journals

- Journal of the World Aquaculture Society
- North American Journal of Aquaculture (PFC)
- Aquaculture
- Journal of Applied Aquaculture
- Aquaculture Nutrition
- Aquaculture Research
- Journal of Aquatic Animal Health
- Transaction of the American Fisheries Society

48. Roster body parts.



49. Types of Aquaculture Systems

1. Pond Fish Culture
2. Raceway Culture
3. Cage Fish Culture
4. Recirculating Water Fish Culture

50. Mesotrophic

Describes the bulk of high-density production systems where risk and economics must be carefully balanced to achieve profitability

51. Define fat?

"Fat-soluble compounds occurring in plant & animal tissues"

Consist of fats, phospholipid, sterols, fatty acids etc. Excessive dietary lipid = nutritional disease e.g., fatty liver or visceral fat Fish can utilize energy of fat by 84% efficiency

52. What is lac?

Lac is the only known commercial resin of animal origin. It is the hardened resin secreted by tiny lac insects belonging to a **bug family**. To produce **1 kg** of lac resin, around **300,000** insects lose their life. The lac insect yields**:**

✓ **Resin** ✓ **Lac dye** ✓ **Lac wax**

53. Propolizing –

The walls of the hive will be covered with a thin coating of propolis, a resinous substance obtained from plants. In combination with enzymes added by the worker this will have antibacterial and antifungal properties. Propolis is also used to close off excessive ventilation and entrances.

54. What are the causes of fish disease?

- ✓ Bad water quality
- ✓ Inappropriate diet
- ✓ Temperature (too high or too low)
- ✓ Stress
- ✓ Bullying(mistreatment, oppression)
- ✓ Viral diseases
- ✓ Fungal infections
- ✓ Bacterial infections
- ✓ Parasites
- ✓ Parasitic conditions: What is a parasite?
- ✓ A parasite is an organism that lives off another often to the detriment of the hosts health.
- ✓ Parasites can be internal (endo-parasites) or External (ecto-parasites).

They can be:

- ✓ Protozoan (single celled)
- ✓ Nematodes/ cestodes / trematodes (worms)
- ✓ Crustacean (e.g. louse)

55. What are Bacteria?

Bacteria are microscopic single celled organisms that can reproduce rapidly.

They are naturally present in aquarium water. **Pseudomonas fluorescens**

56. Apiculture: technical term for beekeeping.

beekeeping, especially on a commercial scale for the sale of honey.

57. Aeration and Oxygenation

- ➢ Oxygen first limiting factor in recirculation fish culture system
- ➢ O_2 is consumed by fish and bacteria inhabiting bio filter
- ➢ In fish tank O_2 should not be less than 5 ppm and in outgoing bio filter water not less than 2 ppm
- ➢ When these levels drop below these concentrations aeration becomes necessary
- ➢ Induction air into water is called aeration while induction of pure oxygen is oxygenation
- ➢ For stocking density up to 45kg/m^3 aeration is enough but for higher stocking densities oxygenation is must

58.

MUHAMMAD IMRAN	FINAL TERM PAPER
ZOO510-Economic-Zoology	PAST 2019/2020

1. Mode of action of pesticide and pest resistance. 10 marks

Mode of action: how they work to control the pest

- Systemic pesticides are absorbed through tissues and transported elsewhere where the pest encounters it through feeding
  - Used on plants or livestock
- **Contact** pesticides must come in direct contact with the target pest

Pesticides vary in how they work to actually control the pest. We call this the mode of action – how they kill or control the pest.

Some pesticides are systemic and actually move through animal or plant tissues and the pest encounters it when feeding on the animal or plant.

Other pesticides work by contact action like battery acid on your pants. You must make sure that you apply the material so that it comes into direct contact with the pest.

Selectivity: what range of pests they affect

- **Non-selective –** kills all related pests – for example some herbicides kill all green plant that gets a sufficient dose
- **Selective** – kills only certain weeds, insects, plant pathogens – for example other herbicides only kill broadleaf weeds not grasses

Pesticides also vary in their selectivity or how many different pest species they target.

Some affect all related organisms equally and are called non-selective. A good example is glyphosate, the active ingredient in Roundup Original. Glyphosate is non-selective when applied to green plants. ANY green plant that gets a sufficient dose will die whether it's a broadleaf or a grass plant.

In contrast, a selective pesticide only kills a small group of related organisms and does not harm others. The herbicide 2,4-D is a good example. It only kills broadleaf plants and does not harm grass plants when applied according to label directions.

Persistence: how long they remain active in the environment

- **Residual pesticides** – remain active for weeks, months, years – for example herbicides used around road guard rails
- **Non-residual –** inactivated immediately or within a few days – for example – some herbicides do not remain active in the soil once applied

Persistence is the term used for how long a pesticide remains present in the environment. DDT, which is no longer used, was a very persistent insecticide that's still found in the environment today. Many of the new products break down in a matter of hours or a few weeks. There are some persistent materials on the market today; we call them residual insecticides and herbicides and use them where we want long-term control.

Applications of residual herbicides are made to rights-of-ways so repeated applications are not required throughout the year.

Non-residual materials are also available, they break down very quickly.

2. Source of protein. 3 marks

Sources of Protein *6 common sources*

1. Soybean Meal

2. Cotton Seed Meal
3. Fish Meal
4. Tankage
5. Skim Milk
6. Alfalfa

3. Difference between hygene quality and milk. 3 marks

Hygiene and Milk Quality

- Dirty milk (containing dirt, bacteria or antibiotics) can cause serious problems when processing.
- Dirty milk is caused by unhygienic milking machines or poor milk filters.
- Antibiotics are found in milk as residues from treatments to cows for mastitis.
- When milk is found to be not up to standard, it may be rejected by the creamery or bought at a lower price.

4. Milk composition .5 marks

Milk used for bottling or drinking must by law contain 3.6% fat and 8.5% SNF.
Creameries buy milk in many different ways – sometimes at a flat rate per kg.
Sometimes, however, it may be by percentage butterfat or protein.
Milk composition varies also amongst different breeds.
The milk of the Jersey cow has the highest butterfat and SNF content of any cow. Also the composition of milk varies during milking.
The milk at the start may only contain 1% fat, while the milk at the end ("The Stripping") may contain 10% fat.

5. Bubonic plague . 5 marks

14th Century Europe: mysterious scourge kills millions
Centuries later it was found that rat fleas became infected with disease-causing bacteria
Fleas sought other warm-blooded hosts (humans) when rat numbers declined
Plague is currently managed monitoring for plague and reducing the number of rodent-hosts for fleas

Do you remember anything from your history lessons about Black Plague in Europe?
During the 14th Century there were Plague outbreaks, millions of people died, and at the time it wasn't understood why. Centuries later, it was discovered that Plague was a bacterial disease and it was spread by fleas found in rodent populations. Besides biting rats, infected fleas would bite humans and other mammals. Bubonic plague is still present in some rodent populations today, even here in the United States. But with rodent management and plague monitoring, only a few people a year are infected with plague.

6. Bio accumulation .2 marks

Bioaccumulation: when a chemical accumulates in animal fat (historical fact)
Bioaccumulation is the gradual accumulation of substances, such as pesticides, or other chemicals in an organism.

Bioaccumulation occurs when an organism absorbs a substance at a rate faster than that at which the substance is lost by catabolism and excretion.

7. Monogastric and polygastric .2 marks

A monogastric organism has a simple single-chambered stomach, compared with a ruminant organism, like a cow, goat, or sheep, which has a four-chambered complex stomach.

Monogastric (simple stomach)
Pig, Dog, Human

Polygastric (ruminants)

Ruminants are mammals that are able to acquire nutrients from plant-based food by fermenting it in a specialized stomach prior to digestion, principally through microbial actions. The process, which takes place in the front part of the digestive system and therefore is called foregut fermentation, typically requires the fermented ingesta (known as cud) to be regurgitated and chewed again. The process of rechewing the cud to further break down plant matter and stimulate digestion is called **rumination** Polygastric (ruminants)

- Cow, Sheep, Goat

8. Common pest control factors.

Natural Pest Controls

1. Wind
2. Temperature
3. Humidity, rain
4. Rivers, lakes, mountains
5. Pathogens, predators
6. Food supply of the pest
7. Cultural control
8. Control by natural enemies
9. Genetic control
10. Natural chemical control

Natural controls are out of man's control – Mother nature dishes these out. They are without a doubt the leading factors that manage pest populations. Natural controls include wind, temperature extremes, humidity levels, and rainfall. A cold snap in the spring or a wet spring can largely reduce insect pest numbers for that season.

Rivers, lakes, and mountains provide significant barriers to pest movement and expansion. Naturally-occurring predators and pathogens hold down pest populations. The natural food supply of the pest also affects population density.

9. 1st ,2nd ,3rd and 4th generation pesticides.

First-generation pesticides (inorganic)

1. First attempt at chemical technology
2. Included heavy metals such as arsenic, copper and lead.
3. Toxic to humans and agricultural plants.
4. Pests developed resistance.

- ***Second-generation pesticides***

1. Organic chemical (organochlorines).
2. Used after WWII (presently in developing countries)
3. Synthesis begins with petroleum ("oil") ✓ Mechanism of actions often unknown.
4. Bioaccumulation & Biomagnification.
5. Toxic to animals (humans) and agricultural plants.
6. Pests developed resistance.

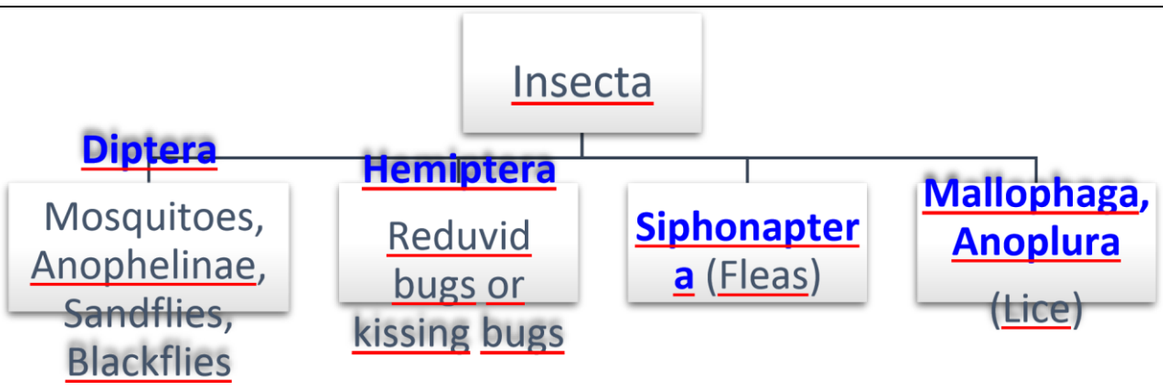
- **Third-generation Pesticides**

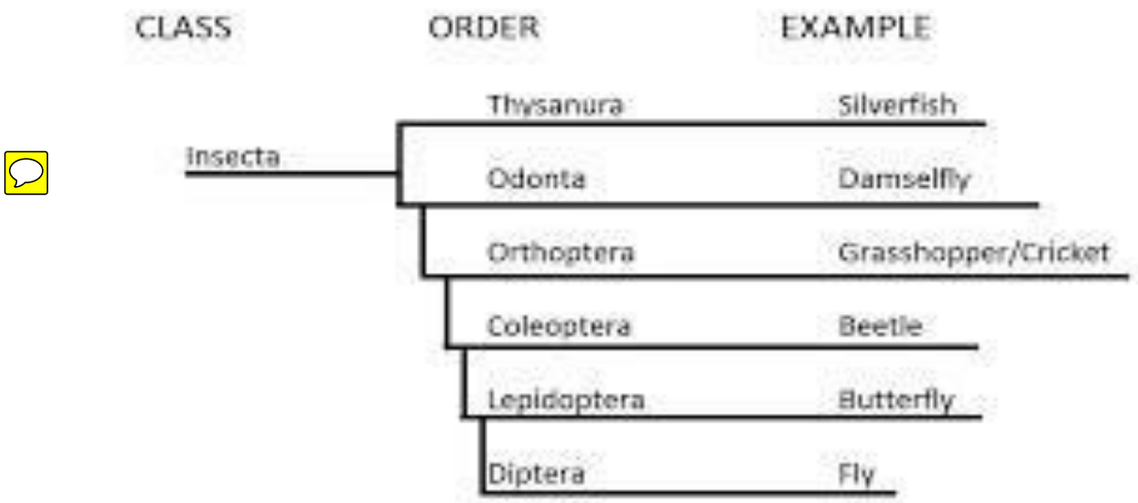
1. Organophosphates and carbamates
2. Less persistent in environment (good deal)
3. Acutely potent nerve toxins
4. More lethal in low dose than organochlorines

Fourthgeneration Pesticides

1. Endocrine disruptors (hormonal chaos) ✓ Target a critical life cycle stage of insects.
2. Not direct killers per say.
3. Reduce reproduction (fertility) of population.

10. Order of class insecta . 5 marks





11. Pest resistance.

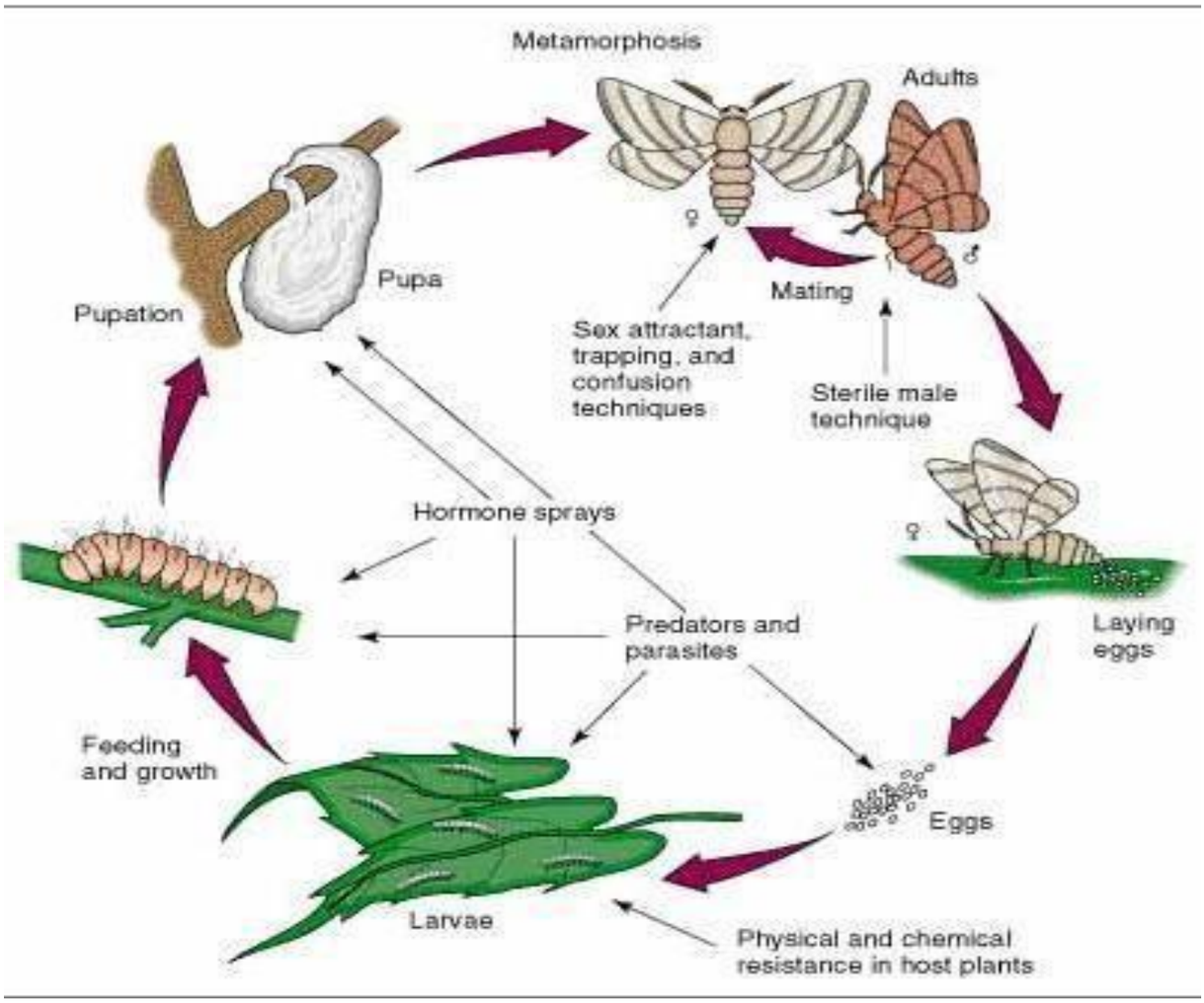
The Insecticide **Resistance** Action Committee (IRAC) defines**pest resistance** as “a heritable change in the sensitivity of a**pest** population that is reflected in the repeated failure of a product to achieve the expected level of control when used according to the label recommendation for that **pest** species.

12. Ecological pest management. 3 marks

Ecological Pest Management (EPM) is an approach to increasing the strengths of natural systems to reinforce the natural processes of pest regulation and improve agricultural production.

1. Control based on pest life cycle and ecology
2. Control agent may be an organism or chemical
3. Specific to pest and/or manipulate a part of the ecosystem
4. Emphasizes protection from pest

13. Life cycle of insects.



1. Egg

You can find insect eggs everywhere, if you know where to look. Most insects lay their eggs near the food they like to eat. Moths and butterflies lay eggs underneath leaves. Dung beetles lay eggs in balls of animal poop. Many flies lay eggs on meat. Some insects even lay eggs on other animals.

Many insects make special cases to protect their eggs. One insect puts foam around its eggs. You may have seen this “cuckoo spit” in tall grass. Many insects lay eggs in pools, ponds, or streams. Others lay their eggs underground. Rarely, a female insect keeps the eggs inside her body. The eggs hatch, and the young are born alive.

2. Larva .

Most eggs hatch into a worm-like stage called a larva. Caterpillars, grubs, and maggots are larvae (LAR-vee). They have long bodies and many legs. Almost all larvae are eating machines. A larva can eat more than its own body weight in one day.

Many larvae can destroy crops. Some larvae suck sap from crop roots. Others devour the leaves. Others eat fruits or vegetables. Beetle larvae can weaken and kill trees. Some moth larvae eat wool clothing. On the other hand, the silkworm, a moth larva, makes silk thread.

3. Pupa

Once the larva has grown, it must totally change its shape. And it must protect itself while it does so. Many larvae spin cocoons out of silk or grow hard shells. The pupa does not eat and does not move much. But inside, the insect is very busy changing shape. This change is called metamorphosis (METahMORF-oh-sis).

4. Adult

After the metamorphosis is complete, the pupa hatches as an adult. The adult insect has wings, six legs, and three body parts. Many larvae that lived in water will hatch into adults that live on land. Larvae that lived underground will hatch above the soil.

Adult insects will find mates, and the females will lay eggs.

Sometimes, this is all the adults do. Mayfly adults live for only one day. Most other insects have longer adult lives. They eat, fly, hunt, and work.

5. Nymph

In the three-stage life cycle, eggs do not hatch as larvae. They hatch as nymphs, which look like small adults. Some nymphs do not have full wings. Others, such as the dragonfly nymph, may live underwater.

Nymphs do not turn into pupae. Instead, they shed their skin as they grow. Each time they shed their skin, they look more like an adult. Slowly, the nymph transforms into an adult.

14. Natural pest control factors. 2 marks

15. Treatment of mumbal foot. 5 marks

a) Soak foot in warm water and Epsom salts.
b) disinfect with alcohol.
c) If skin is open, drain pus from abscess.
d) Flush abscess cavity with hydrogen peroxide to cleanout pus and debris.
e) Pack the cavity with antibiotic ointment .
f) wrap the foot with gauze and elastic bandage.

16. Explain lac of insects.

Lac culture is the scientific management of lac insects to obtain a high amount of quality lac. This involves selection and maintenance of host plants, inoculation of host plants with healthy lac insects, collection and processing of lac and protection against enemies.

Lac is the resinous secretion of lac insects. Two species of lac insects Tachardia lacca and T. chinensis are common, of which the former one is predominant in India. India is the highest lac-producing country. Thailand is next in order.

Host plants:
Kusum, Ranjeeni (Khair) and Ber (Plum) trees. The insects live upon plant juice.

Inoculation:
20 to 30 cm long twigs of host plant with old lac crusts are cut and tied with branches of new plants for propagation. The crust contains eggs laid by female insects.

Types of Lac:

1. Kusmi lac:
It grows on Kusum trees. Inoculation is done in January-February and harvested in JuneJuly.

2. Ranjeeni lac:
It grows on trees other than Kusum. Inoculated in October-November and harvested in next May-June.

17. What is biomagnification.

Bio-magnification: when an organism accumulates residues at higher concentrations than the organisms they consume

Some organisms accumulate chemical residues in higher concentrations than those found in their food source. This process is called **biomagnification**. For example, invertebrates with pesticides in their tissues are eaten by fish, which are then eaten by birds. The birds at the top of the food chain accumulate the highest concentration of pesticide residues. Pesticides that bioaccumulate and biomagnify have been removed from the marketplace.

Biomagnification, also known as bioamplification or biological magnification, is the increasing concentration of a substance, such as a toxic chemical, in the tissues of tolerant organisms at successively higher levels in a food chain.

18. Water soluble minerals and vitamins.

19. What is "Biosecurity"?

Protecting your birds from disease .Preventing or controlling disease transmission by vectors • procedures or measures designed to protect the population against harmful biological or biochemical substances.

20. What is a vector?

- Something that may transmit a disease
- Rodents, birds, insects, shoes, car tires, shared equipment, best friend, pet, feed, water, dust, air….

a **vector** is an organism that does not cause disease itself but which spreads infection by conveying pathogens from one host to another. Species of mosquito, for example, serve as **vectors** for the deadly disease Malaria.

21. How many exposures does it take to make your population resistant?

Expose a population to a pesticide several times with mating in between exposures and see how many exposures it takes for resistant bugs to become the majority.

- **Rules of the Game:**

1. Toss your population (pennies) on the ground, and consider all with painted sides showing as exposed to pesticide
2. All exposed yellow (RR = susceptible) die so remove these pennies.
3. All exposed red (rr = resistant) survive and double; add a red penny for each exposed red penny.
4. For every <u>three</u> exposed blue (mild resistance) add one of each color. (Keep track of any remaining blues (<3) to ad to those on the next throw)
5. Keep track of the exposure count and repeat until most pennies are red.

Bioaccumulation:

When a chemical accumulates in animal fat (historical fact) is called bioaccumulation.

Animal by-Products:

The animal by products are as follows:
1-Bones =Button, glue, mineral supplement for livestock feed (Ca)
2--Fat =Chemicals, salves, creams, dressings, lubricants, soaps, food
3- Glands =Medicines, food additives
4- Collagen=Glue, Gelatin
5- Intestinal & Stomach tissue =lunch meats, surgical sutures, strings for musical and sports instruments
6- Fertilizer=Natural

Bubonic Plague:

The plague caused by a bacterium (Yersinia Pestis) and characterized by especially by the formation of buboes is called bubonic plague. This Plague is currently managed monitoring for plague and reducing the number of rodenthosts for fleas.

Average milk composition:

The average milk composition is as follows:

Milk:

a-Water 87.5% b-Total Milk Solids 12.5%

1-Fat 3.8%

2- Solids Non Fat (SNF) 8.7%

i-Lactose 4.6%

ii-Protein (Casien) 3.1%

iii-N Protein 0.2%

iv-Vitamins & Minerals 0.8%

Plants pathogens:

Pathogens: Fungi – Bacteria – Viruses – Nematodes – Phytoplasmas are the pathogens of plants.

Integrated Pest Management(IPM):

Implementation is done by:

1. Select control strategies
2. Timing
3. Economics
4. Environmental impacts
5. Regulatory restrictions

Why practice IPM:

The IPM practice for to Maintains balanced ecosystems, pesticides alone may be ineffective , promotes a healthy environment ,saves money and maintains a good public image

How many exposures does it take to make your population resistant?

The exposure that make our population resistant are as follows:

Toss your population (pennies) on the ground, and consider all with painted sides showing as exposed to pesticide:

1- All exposed yellow (RR = susceptible) die so remove these pennies.

2– All exposed red (rr = resistant) survive and double;

3-add a red penny for each exposed red penny.

4– For every three exposed blue (mild resistance) add one of each color. (Keep track of any remaining blues

Hygiene and Milk Quality:

A science of the establishment and maintenance of health is called hygiene and white liquid with balance diet is called milk.

The hygiene and milk quality is as follows:

The milk without dirt (bacteria or antibiotics, poor milk filters by bacteria or antibiotics, low cream and animal mastitis) is hygiene and milk quality.

Ecological pest management:

The management that focuses on prevent rather than reactive approaches to pest management by increasing biodiversity and creating habitat for natural enemies, land managers can boost natural pest control services and reliance on pesticides in ecology is the ecological pest management.

Natural pest control factors:

The natural pest control factors are as follows:

1-Wind

2-Temperature

3-Humidity, rain

4-Rivers, lakes, mountains

5- Pathogens, predators

6-Food supply of the pest

Characteristics of Phylum arhropods:

1-Highly successful and segmented Eucoelomata with exoskeleton (Arthropod Metamerism)

2-Tagmata/Tagmatization (segments grouped into body regions)

3-Molting, Ecdysis (Ecdysozoa)

4- Hemimetabolous (gradual) / holometabolous (complete)
5- Cephalization (highly developed sensory organs)
6- Open circulatory system (hemolymph / hemocoel)
7- Respiratory system (trachea / book lungs)
8- Malpighian tubules / Coxal glands
9- Involved in virtually every kind of parasitic relationship

Monogastric and Polygastric:

The animal having a simple stomach with only a single compartment is called monogastric.
for example: Pig, Dog, Human .
The animal having a stomach with more than one compartment is called polygastric.
For example: (ruminants) – Cow, Sheep, Goat.

Legs segment in animals:

The jointed appendages are legs segment of animals especially in arthropods. The legs segment of animals that provide travel and protect sensitive organ from damages.

Housefly mouth pars:

Fulcium, clypeus, rostrum, stipes, haustellum,theca, maxillarypalp, labrum, prementum, labellum, pseudotracea, furca and prestomal teeth are mouth parts of housefly.

Vector-Borne Diseases:

diseases : Vectors
1-Dangue: Mosquito
2-Typhus: Rodent
3-Asthma: Cockroach
4-Bubonic Plague: Fleas
5- Skin infection: Louse

Insect life cycle:

1- Egg ----2-larvae----3-pupa----4-adult---

Hemimatabolous and holometabolous:

The gradual or incomplete metamorphosis is called hemimetabolous and complete metamorphous is called holometabolous.

How to control weeds:

Weeds are control by cultural method by using mowing ,grazing , over seeding and improved fertility.

Sources of proteins:

Animals and plants are sources of proteins.

Vector biting Activities:

The nocturnal , diurnal and crepuscular are vector biting activities.

Autogeny and Anautogeny:

A phenomenon in which living organisms are created from non living matter is called autogeny and a strategy in which an adult female insect must eat a particular sort of meal before laying egg in order for her eggs to mature is called anautogeny.