

**14.0 : Introduction****Q.1. Define Animal husbandry.**

**Ans:** The branch of agriculture concerned with the care and breeding of domestic animals such as cattle, dogs, sheep and horse is called Animal husbandry.

**Q.2. Name the branch of biology dealing with all aspects of domesticated animals.**

**Ans:** Animal husbandry.

**Q.3. Give an account of 'Animal husbandry'.**

**Ans:** i) It is defined as "the agricultural practice of breeding and raising livestock."

ii) It includes poultry and fish farming also. It also includes the care and breeding of livestock which are useful to humans such as pigs, buffaloes, cows, horses, camels, goats, cattle, sheep.

iii) The fisheries involves 'the rearing, catching, selling of fish, molluscs like shell-fish and crustaceans like prawns, crabs, etc.'

iv) Bees, crabs, silk-worm, prawns, fishes, camels, birds, pigs, cattle and sheep have been used by humans for products like milk, silk, honey, eggs, meat and wool.

v) About 70% of world livestock population is found in China and India.

**Q.4. Briefly explain the contribution of animal husbandry in human welfare. OR**

**Explain in brief the role of animal husbandry in human welfare.**

**Ans:** i) It plays major role in our efforts to increase food production in India.

ii) Sericulture provides silk which is used to prepare garments.

iii) Dairy provides milk and milk products to us.

iv) Poultry provides eggs and meat to us.

v) Bee-keeping and fisheries provides food materials.

vi) Products obtained from animals benefits Indian Economy.

vii) Animal husbandry also provides employment opportunities to the people.

**Q.5. "Indian Economy is based on agriculture". Explain.**

**Ans:** i) 80% of the manpower in India is settled in rural India.

ii) Rural Indians are dependent on agricultural practices for food, clothing and other necessities.

iii) Hence, Indian economy is based on agriculture.

**14.1 : Management of Farms and Farm Animals****Q.6. What is management of farms ?**

**Ans:** Farm management is the controlled and scientific handling of farm animals in their rearing, grooming, breeding and caring so as to maximise their yield.

**Q.7. How the production of animal husbandry can be improved ?**

**Ans:** Following measure will be helpful to improve production of animal husbandry :

i) Industrial principle of production, processing and marketing has to be employed.

ii) New technologies has to be introduced in various animal farm systems.

iii) Farm management procedures need to be followed.

**Q.8. Enlist, the principles of farm management.**

**Ans:** Principles of farm management:

i) Selection of high yielding breeds.

ii) Satisfying their food requirements, supply of adequate nutritional sources.

iii) Maintaining the cleanliness of environment.

iv) Maintenance of health and veterinary supervision, vaccination.

v) High yielding cross-breed development.

vi) Preservation and production of products.

vii) Distribution and marketing

## 14.2 : Dairy Farming

### Q.9. Define the Dairy.

**Ans:** It is an industry which involves the production, processing and distribution of milk and milk products.

### Q.10. What is Dairying ?

**Ans:** The management of animals for milk and its products for human consumption is called Dairying.

### Q.11. Which animals are reared in the dairy farm ?

**Ans:** Cow, buffalo, goat and sheep are the animals that are reared in the dairy farm to get milk.

### Q.12. List Indian breeds and exotic breeds.

**Ans:** Indian breeds – Gir, Sahiwal, Red sindhi.

Exotic breeds – Jersey, Brown swiss, Holstein.

### Q.13. Name the breeds of buffaloes in India.

**Ans:** Jaffarabadi, Mehsana, Murrah, Nagpuri, Nili and Surati.

### Q.14. Give a brief note on feed of cattle.

- Ans:** i) Quality and quantity of fodder should be in proper ratio.  
 ii) Silage made from legume, grasses, maize and jowar makes good feed.  
 iii) Silage is supplemented with oil cakes, minerals, vitamins and salts.  
 iv) Seeds of cotton, oil cakes, grains of cereals are rich in proteins, highly palatable and easily digestible also.  
 v) Feeding needs balanced diet as per body requirement and productive capacity.  
 vi. Overfeeding and under-feeding must be avoided as these influence the productivity of animals.

### Q.15. Explain the efforts which must be put to improve health, hygiene and milk yield of cattle in dairy farm.

- Ans:** i) Quality breeds should be imported. Selection of good breeds is important.  
 ii) Cattle's care should be taken against diseases.  
 iii) Vaccination and Veterinary supervision should be done.  
 iv) Adequate water and disease free environment should be provided.  
 v) Adequate and healthy food should be given.  
 vi) Cattle farm should be clean and dry and should have adequate facilities for feeding, watering and light.

### Q.16. If your family owned a dairy farm, what measures would you undertake to improve the quality and quantity of milk production ?

OR

**As a dairy owner what measures would you adopt to improve the quality of milk?**

**Ans:** The following measures we will undertake to improve quality and quantity of milk production.

- Clean drinking water will be provided to the farm animals.
- Hygienic conditions will be maintained in the dairy farm.
- Shelter will be kept properly ventilated for sunlight, air and it will be clean and dry.
- Regular brushing of animals to remove dirt and loose hair.
- Dairy farm should be spacious so as to provide enough space for each animal.
- Identification of health problems, diseases and rectification by veterinary doctor is mandatory.
- Select good breeds having high yielding potential under climatic condition of the area.
- Adequate amount of healthy food will be given to all animals daily.

### Q.17. Give the suitable environmental condition for dairy farming (Dairying).

**Ans:** Following conditions are suitable for dairying:

- Adequate ventilation, adequate space
- Suitable temperature, cleanliness and hygiene
- Sufficient light, water and air
- Well drained housing accommodation.

### Q.18. Name the products obtained from dairy industry.

**Ans:** Milk, curd, cream, butter, ghee, condensed milk, khoa, cheese etc. are the products obtained from dairy industry.

### 14.3 : Poultry

**Q.19. Define:** i) Poultry ii) Broiler iii) Layer

**Ans:i) Poultry :** The management and rearing of fowls(Chicken, ducks, turkeys and pheasants) for the production of eggs and meat.

ii) **Broiler :** Chicken which are reared for meat are called as broilers.

iii) **Layer :** Chicken which are reared for eggs are called as layers.

**Q.20.Which breed of fowl is better for laying eggs and which one is better for table ?**

**Ans:** White leghorn is an excellent egg laying breed. Desi breeds are good for table.

**Q.21. Add a note on poultry house management.**

**OR**

**Explain in short the poultry management.**

**Ans:i)** Proper ventilation should be maintained in the poultry house.

ii) Poultry floor should be dry, comfortable and well maintained.

iii) It should be made up of finely chopped straw, paddy husk, dry leaves.

iv) Suitable climatic conditions should be maintained according to summer and winter.

v) Selection of proper and disease free breed should be done.

vi) Proper vaccination should be done.

vii) Proper feed should be given to fowls.

viii) Proper light, sanitation and cleanliness should be maintained.

ix) Proper debeaking and cutting must be done.

**Q.22. Name some exotic and desi breeds of fowls.**

**Ans:** Domestic fowls are divided into two groups:

i) The indigenous (desi) breed. ii. Exotic or improved breeds.

i) The indigenous (desi) breed: It includes Aseel, Kadarnath, Bursa and Chitong.

ii) Exotic breeds: White leghorn, Rhode Island Red, Plymouth Rock, Wyandotte, New Hampshire.

**Q.23.What is the significance of poultry?**

**OR**

**Explain the economic importance of poultry.**

**Ans:**Poultry farming has the following advantages :

i) **Food :** It provides eggs and meat.

They are rich source of animal protein, minerals fats and vitamins (A ,B and D) for good health. Unfertilized eggs are called "Vegetarian eggs".

ii) **Side business:** It provides employment to a large number of people .It increases income of farmer by selling eggs and meat.

iii) **Manure:** Fecal matter of birds form a rich manure which increases the fertility of soil. It increases crop yield.

iv) **Feather :** Feathers of bird are used for decorative articles and in pillow.

**Q.24.Name the viral diseases in poultry animals.**

**[Oct 2013]**

**Ans:** Viral diseases in poultry animals include Ranikhet, Bronchitis, Avian influenza etc.

**Q.25.Enlist the poultry diseases.**

**Ans:i)** Poultry diseases are of various types such as viral, bacterial, fungal, protozoan diseases.

ii) Fungal diseases of poultry are Aspergillosis, Favus and Thrush.

iii) Parasitic diseases include louse infestation, round worm, ceacal worm infection.

iv) Viral diseases include Ranikhet, bronchitis, Avian influenza etc.

v) Bacterial diseases include Pullorum, Cholera, Typhoid, TB, CRD, Enteritis etc.

### 14.4 : Animal Breeding

**Q.1.Q.26. What is the major achievement of animal breeding ?**

**[Mar 2013]**

**Ans:**Improving the desirable qualities of product and to increase the yield of animals are the main achievements of animal breeding.

**Q.27. What is meant by the term "breed"? What are the objectives of animal breeding ?**

**OR**

**What are the objectives of animal breeding ?**

**Ans:** A breed is a group of animals having common ancestor and similar in most of general characters (like appearance, morphological features, size, configuration, etc.) and related by descent.

**Main objectives of animal breeding are:**

- To develop pure lines of cattle by inbreeding.
- To tide over the problem of inbreeding depression by out-crossing.
- To combine the good qualities of two different breeds by cross-breeding.
- To combine the desirable characters of two different species by interspecific hybridisation so that highly economical hybrids are produced.
- To improve desirable quality of product.
- To increase yield from animals.

**Q.28. What is animal breeding? What are its types ?**

**Ans:** It is the process of breeding to increase yield of the animals and improvement of desirable qualities of products.

There are basically two types of breeding :

- Inbreeding
- Outbreeding.

**Q.29. Define the following terms.**

- Inbreeding**
- Out breeding**
- Cross breeding**
- Out crossing**
- MOET**

**Ans: i) Inbreeding:** Mating of two closely related individuals within the same breed for 4 to 6 generations is called inbreeding.

**ii) Out breeding:** It is breeding of unrelated individuals of the same breed but having no common ancestors for four to six generations, or between different breeds or even different species.

**iii) Cross breeding :** Mating of superior male of one breed with superior females of another breed is called cross breeding.

**iv) Out crossing:** It is the mating of two animals within the same breed, but having no common ancestors on either side of mating partners upto 4-6 generations.

**v) MOET :** It means multiple ovulation embryo transfer technology. It is a programme used for successful production of hybrids.

**Q.30. What are the advantages of animal inbreeding ?**

**Ans:** Advantages of animal inbreeding are :

- It increases homozygosity in cattles.
- By this method pure line of animals are obtained.
- It accumulates the superior genes.
- Inbreeding remove harmful genes by natural selection method.

**Q.31. Distinguish between Inbreeding and Cross breeding.**

**Ans:**

No.	Inbreeding	Cross breeding
i.	It is defined as the process of crossing of superior male and female of the same breed.	It is defined as the process of crossing of superior male of one breed with superior female of another breed.
ii.	It may result in inbreeding depression	It results in heterosis.

**Q.32. What is inbreeding depression ?**

**Ans:** When inbreeding is continuously practiced; it reduces fertility and productivity. This is called inbreeding depression.

**Q.33. Explain the advantages of inbreeding in cattle population. How can we overcome inbreeding depression ?**

**Ans:** Following are the advantages of inbreeding in cattle population :

- It results in accumulating superior genes.
- It helps to eliminate recessive and unwanted genes.
- It increases productivity of inbred population.

To overcome inbreeding depression, selected animal of breeding cattle population must be mated to unrelated superior animals.

**Q.34. What is interspecific hybridisation ?**

**Ans:** It is a method by which male and female animals of two different related species are mated.

**Q.35. Name the type of animal breeding carried out to produce a mule.**

[Mar 2014]

**Ans:** Interspecific hybridization is the type of animal breeding carried out to produce a mule.

**Q.36. How controlled breeding experiments are carried out ?**

**Ans:** Controlled breeding are carried out by two ways :

- i) Artificial insemination                      ii) MOET
- i) **Artificial insemination :** In this method, semen is collected from superior male and injected into the reproductive tract of selected female. Semen is preserved in frozen state. Semen can be used immediately or can be frozen and used on later date.
- ii) **MOET :** It is one method for herd improvement. In this method the cow is administered with hormones to induce follicular maturation and super ovulation. In this method instead of one egg per cycle, they produce 6-8 eggs. Female is either mated with elite bull or artificially inseminated.

**Q.37. What are the advantages of MOET technology ?**

**Ans:** Following are the advantages of MOET technology.

- i) By using this technology, high milk yielding females and high quality meat yielding males/bulls have been raised successfully.
- ii) The herd size is increased with improved animals in a short period of time.

**Q.38. What is meant by superior female in cattle ?**

**Ans:** A superior female of a cattle is the one which yields more milk per lactation.

**Q.39. Enlist the methods employed in animal breeding.**

**Ans:** Various methods are available for animal breeding such as inbreeding, outcrossing, cross-breeding, interspecific hybridization etc.

- i) **Inbreeding :**
  - a) Inbreeding means mating of two closely related individuals within the same breed for 4 to 6 generations.
  - b) In inbreeding superior male and superior female of same breed are mated. Progeny obtained from mating is evaluated. Again superior male and female are used for further mating.
  - c) Inbreeding helps in accumulation of superior gene and elimination of harmful genes by selection.
- ii) **Outcrossing**
  - a) Outcrossing is the process of mating animals within the same breed, but which have no common ancestors on either side of their pedigree up to 4-6 generations; the offspring resulting from this cross is known as an outcross.
  - b) This is considered as the best breeding method for animals that are below average in milk yield, growth rate in beef cattle etc.
  - c) Outcrossing also helps to overcome inbreeding depression.
- iii) **Cross-breeding**
  - a) Cross-breeding is the process of crossing superior males of one breed with superior females of another breed
  - b) Cross-breeding helps to combine the desirable qualities of two different breeds into the hybrid. The hybrid animals of the progeny may be directly used for commercial production or they can be subjected to some form of inbreeding and selection, to develop breeds that are superior to the existing breeds. In this manner, many new breeds of animals have been developed. One good example is Hisardale, a new breed of sheep developed by crossing Marino rams and Bikaneri ewes.
- iv) **Interspecific hybridisation**
  - a) It is the crossing of selected male and female animals of two different species; the progeny may combine the desirable features of the two parents (species) and may be of considerable economic value. An example of this type of crossing is a mule which is produced by a cross between male donkey and female horse (mare).

**Q.40. List any three outbreeding practices carried out to breed domestic animals. Explain the importance of each one listed.**

**Ans:** Three outbreeding practices are :

- i) Outcrossing                      ii) Cross breeding                      iii) Interspecific hybridization
- i) **Outcrossing :**

To get outcross, animals are mated within same breed but possessing no ancestral breed in the pedigrees



for upto four to six generations at least.

**Importance:** This help to overcome the inbreeding depression.

**ii) Cross-breeding :**

The mating of a superior breed of male to super female of other breed is called cross-breeding  
Importance: Used for commercial production.

**iii) Interspecific hybridization :**

The mating of male as well as the female animals of two different related species. Importance: High milk yielding breeds of buffaloes, cows, sheep and cattle etc.

**Q.41.Name the methods employed in animal breeding. According to you which one of the method is best ? Why ? OR**

**Which methods of animal breeding is best ? Why ?**

- Ans:**i) There are various methods used in animal breeding. Inbreeding, Out- breeding, Out -Crossing, Crossbreeding and Inter-specific hybridisation .
- ii) Out of all these methods out-crossing is the best method.
- iii) In out crossing mating is done between animals of same breed having no common ancestors.
- iv) It increases milk production, growth rate of cattle as well as it overcomes inbreeding depression.
- v) Even a single out cross often helps to overcome inbreeding depression. Hence it is a best method of animal breeding.

**Q.42.What is the process of MOET technology ?**

**OR**

**Explain the technique of multiple ovulation embryo transfer (MOET) in animal breeding. [Oct 2013]**

- Ans:**i) In MOET technology cow is administered with follicle stimulating hormone (FSH)
- ii) It induces follicular maturation and superovulation is brought about.
- iii) By this technique in each cycle 6-8 eggs mature simultaneously.
- iv) Cow is either mated with elite bull or artificially inseminated.
- v) Blastocysts at 8-32 cell stage are recovered non-surgically and transferred to surrogate mother.
- vi) Genetic mother is available for other round of super ovulation.

## 14.5 : Bee Keeping

**Q.43.Define Apiculture.**

**Ans:** Apiculture is a branch of applied zoology which deals with rearing of honeybees to obtain bee products.

**Q.44.Mention any two products of apiculture.**

**Ans:** Honey and beeswax are the two products of apiculture.

**Q.45.Describe various products of bee keeping.**

**Ans:** Products of apiculture are honey, wax, pollen, bee venom and royal jelly

- i) **Beeswax :** It is used in the manufacture of cosmetics, face cream, paints, ointment, insulators, polishes, carbon paper and many other lubricants. Bees wax is used in making candles, statue and casts of models.
- ii) **Honey:** It is a sugar-rich compound having levulose, dextrose, maltose and other sugars, water, enzymes and ash. It is quite helpful in building up of the haemoglobin of the blood. It is also used as preventive against cough, cold and fever. It acts as blood purifier and as a curative for ulcers on tongue and alimentary canal. It is also found that typhoid germs are killed by honey within 48 hours.
- iii) **Bees venom :** Venom from sting is used in the treatment of rheumatoid arthritis and snake bite
- iv) **Royal jelly:** It can be used as a medicine.

**Q.46. Give the use of beeswax.**

**Ans:** Refer Q.45 (i).

**Q.47.What is honey ? What is its importance?**

**Ans:** Refer Q. No.45(ii).

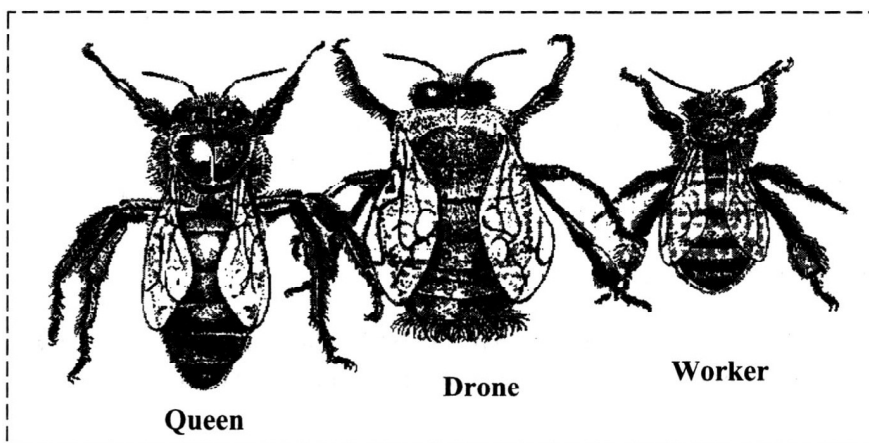
**Q.48.Beekeeper keeps beehives in crop fields during flowering periods. Explain the reason.**

**Ans:** Beekeepers keep beehives in crop fields because:

- i) When bees collect nectar from the flower at that time pollens get stuck to the leg of honey bee.
- ii) This helps in pollination and ultimately it increases the crop yield. While collecting nectar from flowers the pollen gets stuck to the legs of honey bees.

**Q.49. Describe the polymorphism in honeybee.**

**Ans :**



Beehive colony consists of one queen, 40,000 to 1,00,000 workers and few hundred drones.

- i) Queen is the fertile diploid female of colony. Queen lays both fertile and unfertilized eggs.
- ii) Drones develop from unfertilized eggs. Drones are fertile male. Their function is to mate with queen.
- iii) Workers are sterile females in the colony. Workers perform all the functions including collection of honey in honey comb.

**Q.50. Enlist the species of honey bees.**

**Ans:** *Apis dorsata* (rock bee or wild bee), *Apis florea* (little bee), *Apis mellifera* (European bee) and *Apis indica* (Indian bee) are the species of honey bees.

**Q.51. Enlist the requirements of apiculture.**

**Ans:** Following are the requirements of apiculture.

- i) Beehive boxes with comb found at ion sheets.
- ii) Bee veil
- iii) Smoker
- iv) Bee brush
- v) Gloves
- vi) Gumshoes
- vii) Uncapping knife
- viii) Queen excluder etc.

**Q.52. What Is apiculture? How is it important in our lives?**

**OR**

**How is apiculture useful to human beings ?**

**OR**

**Briefly explain the role of apiculture in our life.**

**Ans:** Apiculture is the process of rearing of honey bees in artificial bee hives for the production of honey and bee wax.

- i) Major products of apiculture are honey and beeswax.
- ii) Honey has high nutritive value. It contains levulose, dextrose, maltose, enzymes, minerals, vitamins and water.
- iii) Honey also has medicinal importance. Honey is used as an antiseptic and sedative. It is used in gastrointestinal disorders.
- iv) Honey bees are pollinating agents. They help to increase crop yield by pollination.
- v) Beeswax is used in cosmetics, paints and ointments.
- vi) Honey is used in manufacturing of cakes and as a flavouring agent.
- vii) Venom from sting is used in the treatment of rheumatoid arthritis and snake bite.

**Q.53. List the tips for successful bee keeping.**

**Ans:** For successful bee keeping following are some important tips:

- i) Knowledge of the nature and habits of bees.
- ii) Selection of suitable location for keeping of beehives.
- iii) Catching of swarms and hiving.

- iv) Management of beehives during different seasons.
- v) Handling and collection of honey, beeswax and other
- vi) Cleanliness of hives, conditioning of brood, water provision periodically are important.

**Q.54. Which crop fields are benefited by service of apiculture ?**

**Ans:** Crop fields of sunflower, mustard, cabbage, cucumber, legumes, fruits are benefited by service of apiculture

## 14.6 : Fisheries

**Q.55. Define fishery.**

**Ans:** Fishery is an industry involving catching, processing, fish farming and marketing of fish and other aquatic animals.

**Q.56. Describe fish as a food.**

- Ans:**
- i) Fishes are good source of food. They have high protein value.
  - ii) Fish is a food rich in proteins and fats.
  - iii) They are digested easily. Fish liver oil is used as medicine.
  - iv) Fish feed is used for farm animals.

**Breeds of Edible Fish :** Fishes are divided into three types :

- a. **Fresh Water Fish :** They inhabit water bodies such as ponds, lakes, streams and rivers. The main species is the carp. Catla is the fastest growing carp. e.g. Catla, *Labeo rohita* (rohu), Mrigal etc.
- b. **Marine Water Fish :** They inhabit seas that wash the coasts of peninsular India. e.g. Hilsa, Catfish, Sardine, Bombay Duck, Mackerel, *Stromateus* (pomphret), etc.
- c. **Estuarine or Brackish Water Fish.** e.g. Mullet, Pearl spot, etc.

**Q.57. Give an account of Indian edible fishes.**

**Ans:** Certain edible Indian fishes are following :

	Fishes Common Name	Zoological Name of Fish
<b>1.</b>	<b>Fresh Water Fishes</b>	
i)	Rohu	<i>Labeo rohita</i>
ii)	Mrigala	<i>Cirrhina mrigala</i>
iii)	Catla	<i>Catla catla</i>
<b>2.</b>	<b>Marine Fishes</b>	
i)	Bombay duck	<i>Herpedon</i>
ii)	Hilsa	<i>Hilsa</i>
iii)	Pomfret	<i>Stromateus</i>
iv)	Mackerel	<i>Rastrelliger</i>
v)	Sardine	<i>Sardinella</i>

**Q.58. Which animals are included in fisheries?**

**Ans:** Fishery includes fishes, prawns, lobsters, oysters, mussels and crabs.

**Q.59. Name the byproducts of fishery.**

**Ans:** Fish as a food, Fish oil, fish meal, fertilizer, fish guano, fish glue and Isinglass are the byproducts of fishery.

**Q.60. Enlist freshwater fishes.**

**Ans:** Refer Q. 57

**Q.61. Enlist marine fishes.**

**Ans:** Refer Q. 57

**Q.62. Write the scientific names of four marine fishes.**

**Ans:** Refer Q. 57

**Q.63. Write a short note on fishery.**

- Ans:**
- i) Fishery is a branch of applied biology which deals with the catching, culturing, processing, preserving and marketing of aquatic animals. It is an applied branch of Ichthyology (study of fishes).
  - ii) Though the main product of this industry is fish, other products like molluscs, crustaceans, sponges,



pearls ,etc. are also considered.

iii) Fishery is of three types viz. marine fishery, estuarine fishery and inland fishery.

iv) Maintenance of fish farm has following requirement

- |                      |                            |                   |                 |
|----------------------|----------------------------|-------------------|-----------------|
| a) Selection of site | b) excavation of pond      | c) stocking ponds | d. Water source |
| e) manures           | f) Supplementary food etc. |                   |                 |

**Q.64.What is fish meal ?**

**Ans:** Fish meal is obtained from non-oil type fishes and is rich in proteins.

**Q.65. Explain the economic importance of fisheries.**

**OR**

**Give the economic importance of fishes.**

**[Mar 09,14]**

**Ans:**Economic importance of fisheries:

- i) It is a source of employment for many people.
- ii) It provides nutrient food, as fishes are rich in proteins, vitamins (A, D & E), carbohydrates, fats and minerals.
- iii) It is flourishing as agro-base business as well as an industry.
- iv) It promotes allied business like manufacturing of crafts and gears and also provides raw material to other industries.
- v) It helps in biological control as fishes feed on insect larvae and micro-organisms.
- vi) Oil extracted from the body of fishes has medicinal as well as commercial value. e.g. Shark liver oil, cod liver oil (medicinal value) and oil extracted from sardine and mackerel (commercial value).
- vii) The waste parts of fishes are used to prepare the fertilizers and fish manure.
- viii) Fishes yield number of byproducts such as fish meal, Isinglass, fish glue, fish flour, etc.
- ix) Fishery is a good source of foreign exchange.

**Q.66.Define the term fishery and discuss how fishery is important.**

**Ans:** Refer Q.55& 65.

**Q.67.Enlist the different modes of fish preservation.**

**Ans:** Various methods of fish preservation are given below:

- i) **Chilling with ice :** It is a method of refrigeration. Due to lowering of temperature, putrefaction is prevented and quality of fish is maintained.
- ii) **Deep freezing :** Deep freezing of fishes in brine helps to retain natural appearance of fishes.
- iii) **Freeze drying:** Fishes are frozen and dried.
- iv) **Smoking :** This removes the moisture and prevents growth of bacteria
- v) **Sun Drying :** Fishes are dried in sun to remove moisture.
- vi) **Salting :** By adding salt, dehydration takes place by osmosis.
- vii) **Canning:** Fishes are preserved in cans with salt or other artificial preservatives.

**Q.68.Discuss the role of fishery in enhancement of food production.**

**Ans:** Refer Q. 65 Ans. ii, viii.

## 14.7 : Sericulture

**Q.69.Define sericulture.**

**Ans:** It is a branch of applied zoology which deals with rearing of silkworm and production of silk.

**Q.70.What is the scientific name of mulberry silk worm ?**

**Ans:** Bombyx mori is the scientific name of mulberry silk worm.

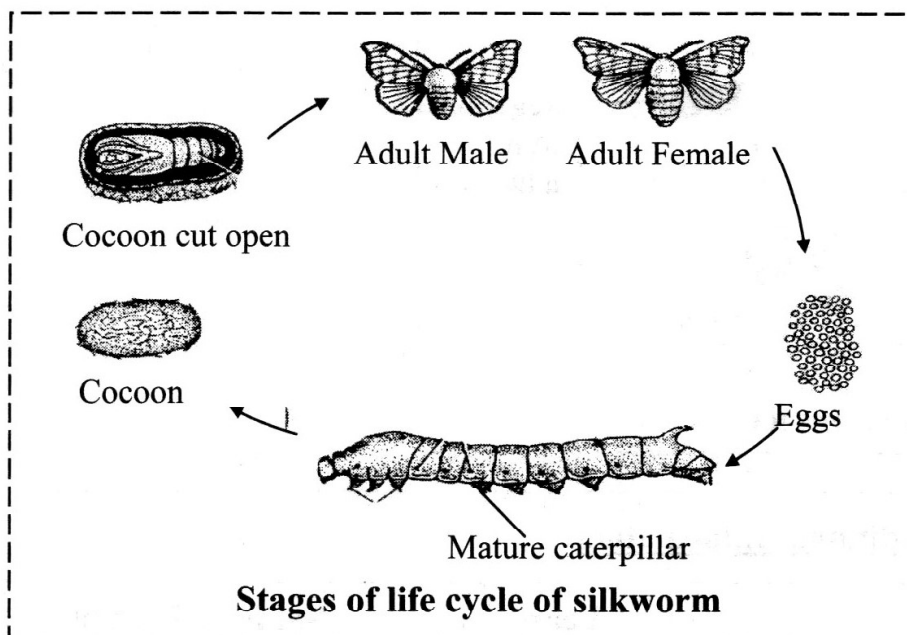
**Q.71. Describe sericulture in brief.**

**Ans:**i) Sericulture is the branch of applied zoology which deals with rearing of silkworm and production of silk.

- ii) Sericulture requires little investment and can be started in a small space.
- iii) Mulberry silk is considered as best silk produced by silk worm *Bombyx mori*.
- iv) Tussar silk and Eri silk are of inferior quality. Quantity and quality of silk depends upon quality of mulberry leaves which is the feed of larvae.
- v) Silk is obtained from the cocoon of silkworm.
- vi) Sericulture requires skilled labour for silkworm rearing and their protection from predators.

**Q.72. Sketch and label life cycle of silk worm.**

**Ans:**



**Q.73. Which precaution should be taken to protect silk production ?**

- Ans:**
- i) Rearing development and looking after of silkworm involves skill, labour and constant watch. A little negligence can spoil the complete industry.
  - ii) Silkworm larvae may be infected by protozoans, viral and fungal diseases.
  - iii) Beside these ant crows, birds and other predators are ready to attack these insects so the cages of larvae must be managed so that predators do not reach.

## 14.8 : Lac Culture

**Q.74. What is lac?**

**Ans:** Lac is the resinous secretion produced by lac insect as a protective covering around its body.

**Q.75. Define Lac culture.**

**Ans:** It is a branch of applied zoology which deals with rearing of lac insects to obtain lac.

**Q.76. Which is common Indian lac insect ?**

**Ans:** Lac insect is *Tacchardia lacca*.

**Q.77. What is the food of lac insects ?**

**Ans:** Lac insects feed on succulent twigs of certain plants like ber, peepal, palas, kusum, babool etc.

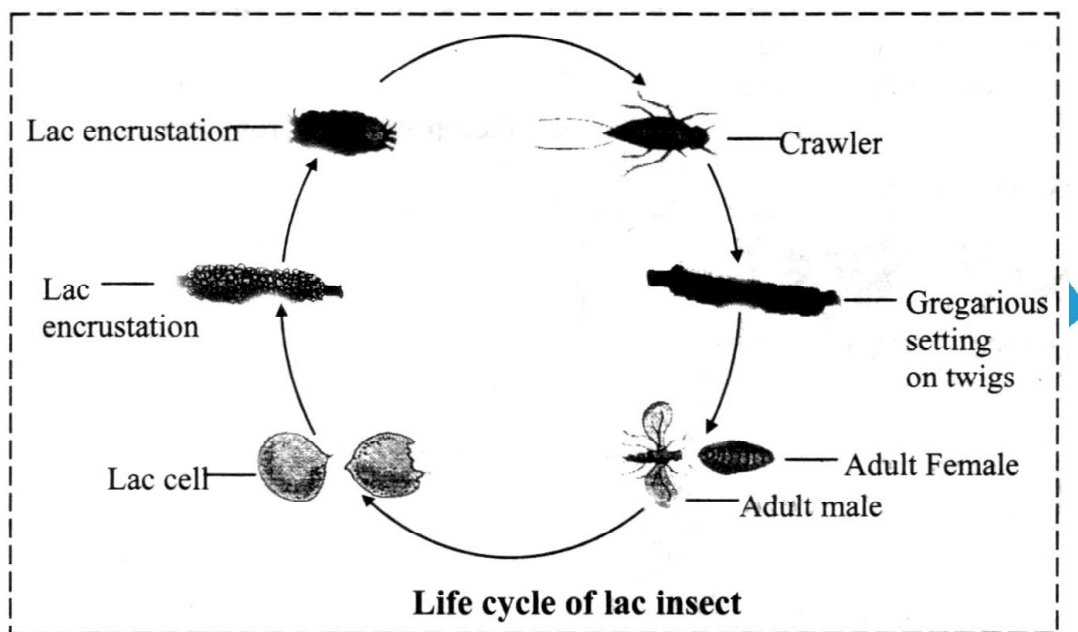
**Q.78. Give the economic importance of lac.**

**Ans:** Economic importance of lac:

- i) Lac is used in the preparation of sealing wax, paints, varnish, electrical goods.
- ii) Lac is used in the preparation of bracelets, buttons, toys and in filling hollow gold ornaments.
- iii) Lac is used in artificial leather and pottery.
- iv) It is also used in the gramophone industry.
- v) It is used for coating fruits and vegetables.

**Q.79. Explain lac culture.**

- Ans:**i) Lac is a pink colored resin which hardens on coming in contact with air forming lac.  
 ii) *Tacchardia lacca* is most commonly used for lac culture.  
 iii) Lac insects feed on succulent twigs of certain plants like Ber, peepal, palas, kusum, babool etc.  
 iv) Natural lac is always contaminated so washing and filtering is needed to obtain shellac in pure form.  
 v) India contributes upto 85% of total lac production in world.  
 vi) Lac is the byproduct of lac culture which is used in bangles, toys, woodwork, polish inks, silvering mirrors etc.

**Q.80. Sketch and label life-cycle of lac insect.****Ans:****Additional Information**

No.	Invention/Discovery	Year	Name of Scientist
1.	Father of Modern Apiculture for discovering the phenomenon of parthogenesis in bees and designing the first movable-frame beehive.		Johan Dzierzon
2.	First hatchery for pisciculture	1800s	Seth Green
3.	First use of silkworm to create Silk	2700 B.C.	Si-Ling-chi (Chinese) called Goddess of Silk worms)

**Multipal Choice Questions**

- Indian breed of cow is
  - Jersey
  - Brown Swiss
  - Holstein
  - Gir
- is an exotic breed of cow.
  - Sahiwal
  - Gir
  - Sindhi
  - Jersey
- Murrah is a breed of
  - buffalo
  - sheep
  - goat
  - cow
- Livestock includes
  - Buffaloes, cows, horses
  - Pigs, camel
  - Sheep, goats
  - all of the above
- The good milk producer Indian buffaloes are
  - Nagpuri, Murrah and Surati
  - Mehsana, Gir and Sindhi
  - Jersey, Holstein and Nili
  - Murrah, Sahiwal and Brown Swiss
- Under controlled conditions rearing a variety of birds such as fowls, ducks, etc. is called
  - Poultry
  - Fishery
  - Dairy
  - Pisciculture
- Poultry includes
  - fowl, duck, tortoise and turkey.

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- b) fowl, duck, pigeon and tortoise  
c) duck, fowl, tortoise and turkey  
d) fowl, duck, turkey and pigeon
8. Main product of poultry is  
a) eggs                      b) chicken  
c) meat                      d) eggs and meat
9. Fowls raised for eggs are called  
a) layers                      b) broilers  
c) broods                      d) none of these
10. The best layer chicken is  
a) Leghorn  
b) Rhode Island Red  
c) Brahma  
d) Kedarnath
11. Bird flu is caused by  
a) bacteria                      b) protozoan  
c) fungi                      d) virus
12. Pullorum is a  
a) viral                      b) bacterial  
c) fungal                      d) parasitic
13. Best table bird among the native breeds is  
a) Ghagus                      b) Aseel  
c) Cochin                      d) Bursa
14. Ranikhet disease is characteristic of  
a) poultry birds  
b) sericulture insects  
c) apiculture insects  
d) pet animals
15. Inbreeding helps in  
a) accumulation of superior genes.  
b) elimination of harmful or less desirable genes by selection  
c) increasing heterozygosity  
d) both a) and b)
16. Mule is outcome of  
a) inbreeding  
b) artificial insemination  
c) interspecific breeding  
d) outcrossing
17. Artificial insemination in livestock means  
a) fertilization of ovum in laboratory  
b) deposition of spermatozoa in the vagina of female by mechanical means for forthcoming fertilization of the egg  
c) both a) and b)  
d) none of these
18. Super-ovulation and embryo transplantation are meant for improving  
a) human race                      b) livestock  
c) poultry                      d) plants
19. Multiple ovulation embryo transfer technique is used for  
a) production of hybrids  
b) inbreeding  
c) crossbreeding  
d) outcrossing
20. In MOET technology, which cell stage is transferred to surrogate mothers?  
a) 2-4 cell stage                      b) 4-8 cell stage  
c) 8-16 cell stage                      d) 8-32 cell stage
21. Apiculture is  
a) culture of aquatic animals  
b) culture of silk worms  
c) culture of honey bees  
d) culture of prawns
22. \_\_\_\_\_ is the best Indian domesticated bee.  
a) Apis dorsata                      b) Apis Indica  
c) Apis florea                      d) Apis mellifera
23. Bee keeping requires  
a) bee hive boxes with comb foundation sheets, bee veil, smoker  
b) bee brush, gloves, gumshoes  
c) uncapping knife, swarm net, queen excluder  
d) all of these
24. The benefit that acquired from involving into apiculture is  
a) collection of honey  
b) collection of wax  
c) gainful employment  
d) all of these
25. 'Pisciculture' is a culture of  
a) aquatic animals  
b) prawns  
c) fishes  
d) none of the above
26. The common fresh water fish is  
a) Rohu                      b) Sardine  
c) Pomphret                      d) Prawn
27. \_\_\_\_\_ is the most demanded fish.  
a) Pomphret                      b) Catla  
c) Mackerel                      d) Rohu

28. Fish can be preserved for longer duration by which of the following methods?
- Chilling, freezing, freeze drying
  - Sun drying, smoke drying
  - Salting, canning
  - All of the above
29. Domestication of silk worm is called
- sericulture
  - pisciculture
  - apiculture
  - horticulture
30. Which one of the following produces silk ?
- Bombus indica*
  - Bombyx mori*
  - Butterflies*
  - Dysdercus koenigii*
31. 'Bombyx mori' feeds on OR food of silk worm is
- mulberry fruits
  - mulberry leaves
  - ber leaves
  - castor leaves
32. The best silk is produced by
- Bombyx mori*
  - tussar
  - Eri silkworm
  - muga
33. Which one of the following is a source of silk?
- Eggs
  - Caterpillar
  - Cocoon
  - Pupa
34. Lac is a product of
- fecal matter
  - secretion from body
  - excretion from body
  - excess food oozing out of the body
35. The larvae of lac insects feed upon
- leaves of the plant
  - stem of the plant
  - juice of the plant from phloem
  - insects of other groups
36. Lac is used in
- varnish industry only
  - printing and varnish industries only
  - gramophone records, varnish, electrically insulated goods and printing industries
  - none of these
37. Commercial lac is produced from
- the nest of a type of bird
  - the exudation of a lac insect
  - the scale of a type of fish
  - the root of a plant
38. Shellac is form of lac.
- natural
  - contaminated
  - pure
  - artificial

## Answer Keys

1.	b)	2.	d)	3.	a)	4.	d)	5.	a)	6.	a)	7.	d)	8.	d)	9.	a)	10.	a)
11.	d)	12.	b)	13.	b)	14.	a)	15.	d)	16.	c)	17.	c)	18.	b)	19.	a)	20.	d)
21.	c)	22.	b)	23.	d)	24.	d)	25.	c)	26.	a)	27.	a)	28.	d)	29.	a)	30.	b)
31.	b)	32.	a)	33.	c)	34.	b)	35.	c)	36.	c)	37.	b)	38.	c)				





