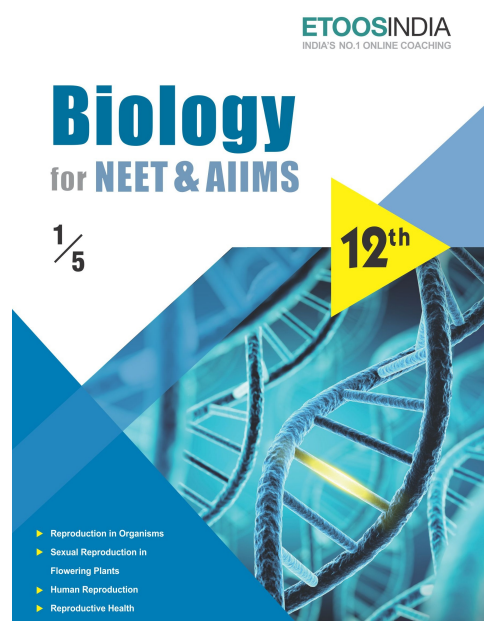
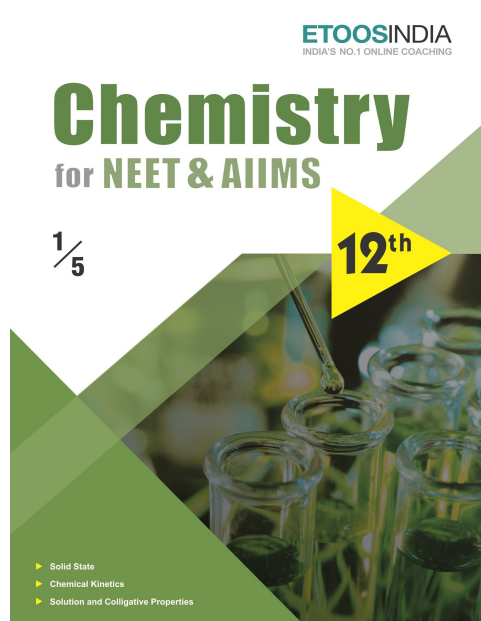
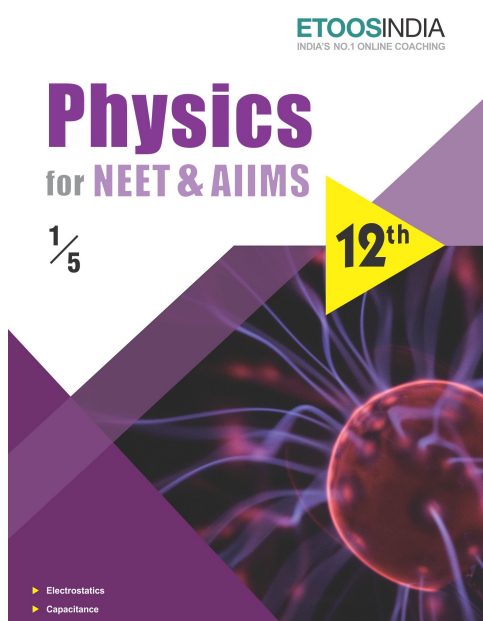
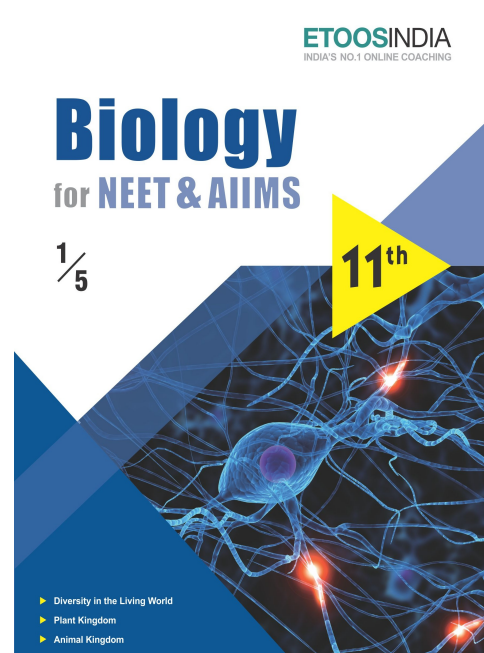
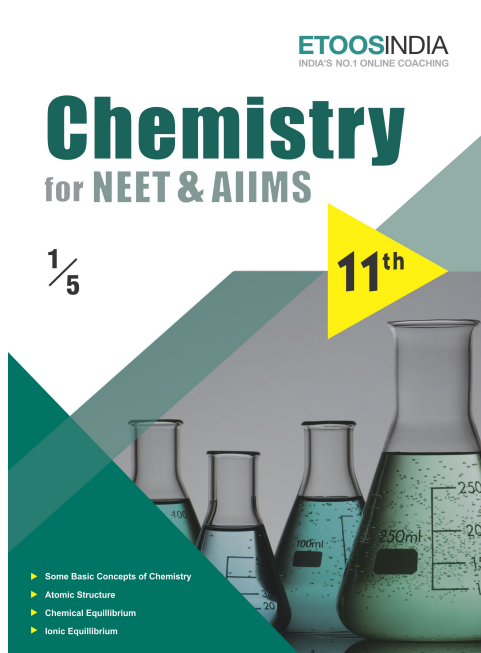
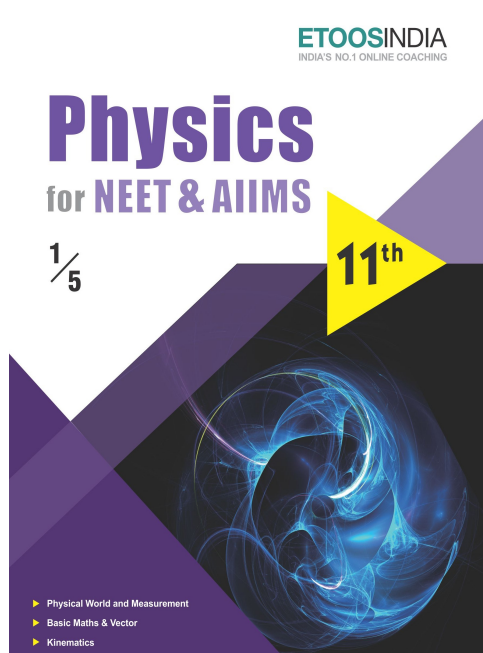


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STRATEGIES FOR ENHANCEMENT IN FOOD PRODUCTION

“Food is the moral right of all who are born into this world.”

“NORMAN E. BORLAUG (1914-2009)”

INTRODUCTION

Human beings derive their nutrition from plants and animals. If we look at the history, humans also have hunted wild animals and collected fruits from wild plants. After so many years, they began to cultivate plant species and rear animals under their supervision. With ever-increasing population of the world, enhancement in food production is a major necessity. Biological principles as applied to animal husbandry and plant breeding have a major role in our efforts to increase food production. So many new techniques have been adopted like embryo transfer technology and tissue culture techniques are going to play a pivot role in further enhancing food productions.

Strategies For Enhancement in Food Production

With ever-increasing population of the world, enhancement of food production is a major necessity. Biological principles as applied to animal husbandry and plant breeding have a major role in our efforts to increase food production. Several new techniques like embryo transfer technology and tissue culture techniques are going to play a vital role in further enhancing food production.

Animal Husbandary

Animal husbandry is the agricultural practice of breeding and raising livestock. As such it is a vital skill for farmers and is as much science as it is a vital skill for farmers and is as much science as it is art. Animal husbandry deals with the care and breeding of livestock like buffaloes, cows, pigs, horses, cattle, sheep, camels, goats, etc., that are useful to humans. Extended, it include poultry farming and fisheries. Fisheries include rear ing, catching, selling, etc., of fish, molluscs (shell-fish) and crustaceans (prawns, crabs, etc.). Since time imme morial, animals like bees, silk-worm, prawns, crabs, fishes, birds, pigs, cattle, sheep and camels have been used by humans for products like milk, eggs, meat, wool, silk, honey, etc.

It is estimated that more then 70 per cent of the world livestock population is in India ans China. However, it is surprising to note that the contribution to the world farm produce is only 25 per cent ,i.e., the productivity per unit is very low. Hence, in addition to conventional practices of animal breeding and care, newer technologies also have to be applied to achieve improvement in quality and productivity.

Management of Farms and Farm Animals

A professional approach to what have been traditional practices of farm management gives the much needed boost to our food production.

Dairy Farm Management

Dairying is the management of animals for milk and its products for human consumption. In dairy farm management, we deal with processes and systems that increase yield and improve quality of milk. Milk yield is primarily dependent on the quality of breeds in the farm. Selection of good breeds having high yielding potential (under the climatic conditions of the area), combined with resistance to diseases is very important. For the yield potential to be realised the cattle should be carried out in a scientific manner - with special emphasis on the quality and quantity of fodder. Besides, stringent cleanliness and hygiene (both of the cattle and the handlers) are of paramount importance like milking, storage and transport of the milk and its products. Nowadays, of course, much of these processes have become mechanised, which reduces chance of direct contact of the produce with the handler. Ensuring these stringent measures would also help to identify and rectify the problems as early keeping. It would also help to identify and rectify the problems as early as possible. Regular visits by a veterinary doctor would be mandatory.

Poultry Farm Management

Poultry is the class of domesticated fowl (birds) used for food or for their eggs. They tropically include chicken and ducks, and sometimes turkey and geese. The word poultry is often used to refer to the meat on only these birds. but in a more general sense it may refer to the meat of other birds too.

As in dairy farming, selection of disease free and suitable breeds proper and safe farm canditions, proper feed and water, and hygiene and health care are important components of poultry farm management.

You may have seen TV news or read newspaper-reports about the 'bird flu virus' which created a scare in the country and drastically affected egg and chicken consumption, Find out more about it and discuss whether the panic reaction was justified. How can we prevent the spread of the flu in case some chicken are infected?

1. DOMESTICATION OF PLANTS

- Recorded evidences of plant breeding dates back to 9000 - 11,000 years ago.
- The main step of plant breeding is
 - (1) Collection of variability
 - (2) Evaluation and selection of parents
 - (3) Cross hybridisation among the selected parents
 - (4) Selection and testing of superior recombinants
 - (5) Testing, release and commercialisation of new cultivators.
- Genetic variability is the root of any breeding programme.
- The entire collection (of plants/seeds) having all the diverse allele for all genes in a given crop is called germplasm collection.
- Agriculture accounts for approximately 33% of India's GDP and employs nearly 62 percent of the population.
- P-1542 is indian hybrid crop of pea.
- During the period 1960 to 2000, wheat production increased from 11 million tonne to 75 million tonnes while rice production went up from 35 million tonnes to 89.5 million tonnes.
- In 1963 Sonalika, kalyan Sona, which were high yielding and disease resistant varieties of wheat, were introduced in india.
- Semi dwarf rice variety [IR-36], which were derived from IR-8 [developed at IRR, philippines] and taichung native-1 (from taiwan) introduced in india in 1966.
- Jaya and Ratna which are better yielding dwarf varieties of rice, later developed in India .
- Saccharum barberi (grown in north india) had poor sugar content and yield and saccharum officinarum (grown in South India) had thick stem and higher sugar content. By crossing of these two varieties we developed new varieties which have desirable qualities like high yield, thick stem, high sugar. [Nobal sugarcane]
- The conventional Method of breeding for disease resistance is hybridisation and selection .
- Some crop vareties developed by hybridisation and selection for disease resistance →

Breeding for disease resistance

Crop	Variety	Resistance to diseases
Wheat	Himgiri	Leaf and stripe rust, hill bunt
Brassica	Pusa swarnim (Karan rai)	white rust
Cauliflower	Pusa shubhra, Pusa snowball K-1	Black rot and curl blight black rot
Cowpea	Pusa Komal	Bacterial blight
Chilli	Pusa sadabahar	Chilly mosaic virus, tobacco mosaic virus and leaf curl

- In mung bean, resistance to yellow mosaic virus and powdery mildew were induced by mutation .
- Resistance to yellow mosaic virus in bhindi (*Abelmoschus esculentus*) was transferred from a wild species and resulted in a new variety of *A. esculentus* called parbhani kranti.
- Hairy leaves in several plants are associated with resistance to insect pests, e.g. resistance to jassids in cotton and cereal leaf beetle in wheat.
- In wheat, solid stems lead to non-preference by the stem sawfly and smooth leaved and nectar-less cotton varieties do not attract bollworms.

SOLVED EXAMPLE

Ex.1 Green revolution in India occurred during

- (A) 1960's (B) 1970's
(C) 1980's (D) 1950's

Sol. (A)

Ex.2 In plants breeding programme, the entire collection (of plants/seeds) having all the diverse alleles for all genes in a given crop is called

- (A) Germplasm collection
(B) Selection of superior recombinants
(C) Cross hybridization among the selected parents
(D) Evaluation and selection of parents

Sol. (A)

Ex.3 In maize, hybrid vigour is exploited by

- (A) Harvesting seeds from the most productive plants
(B) Inducing mutations
(C) Bombarding the protoplast with DNA
(D) Crossing of two inbreed parental lines

Sol. (D)

Ex.4 The new varieties of plants are produced by

- (A) Selection and hybridization
(B) Mutation and selection
(C) Introduction and mutation
(D) Selection and introduction

Sol. (A) : Selection and hybridization is method of crop improvement or new varieties production of plants.

Ex.5 Transgenic plants are the ones

- (A) Produced by a somatic embryo in artificial medium
(B) Generated by introducing foreign DNA in to a cell and regenerating a plant from that cell
(C) Produced after protoplast fusion in artificial medium
(D) Growth in artificial medium after hybridization in the field

Sol. (B) : Transgenic plants are those plants in which a foreign gene has been introduced and stably integrated into host DNA.

Ex.6 Read the following four statements (A - D) about caused by prions in a

- (A) The first transgenic buffalo, Rosie produced milk which was human alpha-lactalbumin enriched
(B) Restriction enzymes are used in isolation of DNA from other macromolecules
(C) Downstream processing in one of the steps of R-DNA technology
(D) Disarmed pathogen vectors are also used in transfer of R-DNA into the host

Which are the two statements having mistakes

- (A) Statements (A) and (C)
(B) Statements (A) and (B)
(C) Statements (B) and (C)
(D) Statements (C) and (D)

Sol. (B)

Ex.7 Mule is a product of

- (A) Camel
(B) Mutation
(C) Hybridisation
(D) Interspecific hybridisation

Sol. (D) : Mule is an interspecific hybrid of the male ass and the mare.

Ex.8 The most commonly maintained species of bee by bee-keepers is

Or

Which one of the following species of bees is used for the commercial production of honey

- (A) Apis mellifera (B) Apis dorsata
(C) Apis indica (D) Apis florae

Sol. (A)

Ex.9 Which among the following is the real product of the honey bee

- (A) Honey (B) Bee wax
(C) Propolis (D) Both (B) and (C)

Sol. (D) : Propolis is a component of honey secreted by honey bee itself and Bee wax is real products of honey bees.

Ex.10 'Cast nets' are used to catch

- (A) Marine fishes (B) Estuary fishes
(C) Freshwater fishes (D) All of the above

Sol. (D)

Ex.11 One of the following is a disease of poultry

- (A) Abdominal gland
(B) Salivary gland
(C) Anthrax
(D) Ranikhet (new castle disease) Aspergilliosis

Sol. (D)

Exercise # 1**SINGLE OBJECTIVE****NEET LEVEL**

1. The centre of origin of wheat is
(A) South-east Asia
(B) South-west Asia
(C) Asia Minor and Afganistan
(D) None of these
2. The origin of sunflower is believed to be in
(A) Peruvian Andes
(B) Mexico and Central America
(C) Brazil
(D) USA
3. Maize evolved in
(A) USA
(B) Brazil
(C) Mexico and Central America
(D) Peruvian Andes
4. South-east Asia is thought to be the centre of origin of
(A) Rice, sugarcane, mango and banana
(B) Rice, sugarcane and mango
(C) Rice and sugarcane
(D) None of these
5. Ethiopia is the native place of
(A) Cabbage (B) Rice
(C) Coffee (D) Maize
6. Dwarf wheats were developed by
(A) Vavilov (B) Borlaug
(C) Swaminathan (D) None of these
7. Majority of the high yielding varieties of 'Indian rice' have been developed by cross between
(A) *O. sativajaponica* times *O. sativaindica*
(B) *O. sativa indica* times *O. nivara*
(C) *O. nivaratimes O. sativajaponica*
(D) *O. nivaratimes O. rufipogon*
8. The product of hybridization is known as
(A) Clone (B) Homozygous
(C) Hybrid (D) Heterozygous
9. Which of the following is not used for crop improvement
(A) Inbreeding (B) Introduction
(C) Hybridization (D) Mutations
10. The indica varieties of rice is crossed with japonic varieties as these are
(A) High yielding
(B) Resistant to diseases
(C) Cheaper
(D) Short life-cycled annual
11. The enzyme DNA polymerase was discovered by
(A) Kornberg (B) Okazaki
(C) Waston and Crick (D) Jacob and Monod
12. Bombay green banana cultivation is the result of
(A) Mass selection (B) Pureline selection
(C) Clonal selection (D) Natural selection
13. The alkaloid from *Colchicum autumnale* of Liliaceae induces
(A) Sterility (B) Dormancy
(C) Cell division (D) Polyploidy
14. Heterosis means
(A) Hybrid vigour
(B) Hybrids are weak
(C) Hybrids are weak as well as vigorous
(D) Hybrids are neither weak nor vigorous
15. Which one of the following chemical induces polyploidy in plant cells
(A) 2, 4-dichlorophenoxy acetic acid
(B) Rifampicin
(C) Cytokinin
(D) Colchicine
16. Which of the following condition is hybrid breakdown
(A) Failure of hybrid adult to produce functional gametes
(B) Failure of the fusion of ova and sperm plant breed of two species
(C) Failure of hybrid zygote to develop into an offspring
(D) None of these
17. The latest trend in plant disease control is
(A) Chemical control
(B) Biological control
(C) Use of fertilizers
(D) Use of disease resistant varieties

Exercise # 2**SINGLE OBJECTIVE****AIIMS LEVEL**

1. Norin-10 gene is
(A) Dwarf gene of wheat
(B) Dwarf gene of rice
(C) Dwarf gene of tomato
(D) Smut resistant gene of wheat
2. Total number of centres of origin of crop plants given by Vavilov is
(A) 2 (B) 4
(C) 8 (D) 11
3. Green revolution means
(A) Increase in production of food plants
(B) Increase in growth of green plants of maintaining ecosystem balance
(C) Growth of green plants in order to check soil erosion
(D) None of the above
4. The dwarf varieties of wheat brought from Mexico into India were
(A) Sonara-64 and Sonalika
(B) Sonara-64 and Lerma Roja-64
(C) Sharbati sonara and Pusa Lerma
(D) Sonalika
5. The native place of *Hevea* rubber is
(A) South-east Asia (B) Brazil
(C) Peruvian Andes (D) Malaysia
6. Pure line breed refers to
(A) Heterozygosity only
(B) Homozygosity only
(C) Heterozygosity and linkage
(D) Homozygosity and self-assortment
7. The improved variety Indore 2 obtained by mutation breeding belongs to which of the following crop varieties
(A) Bajra (B) Cotton
(C) Sugar cane (D) Potato
8. Production of plant without fertilization is done by
(A) Vegetative propagation
(B) Transplantation
(C) Grafting
(D) None of these
9. Desired improved varieties of economically useful crops are raised by
(A) Migration (B) Biofertilizer
(C) Hybridization (D) Natural selection
10. Heterosis requires
(A) Selection (B) Crossing
(C) Transformation (D) Mutation
11. The reason for vegetatively reproducing crop plants to suit for maintaining hybrid vigour is that
(A) They can be easily propagated
(B) They have a longer life span
(C) They are more resistant to diseases
(D) Once a desired hybrid produced, no changes of losing it
12. The new varieties of plants are produced by
(A) Selection and hybridization
(B) Mutation and selection
(C) Introduction and mutation
(D) Selection and introduction
13. Mutations are caused due to
(A) Radioactive mutagens
(B) Chemical mutagens
(C) Radiation mutagens
(D) Change in base sequence
14. *Triticale* is the hybrid between wheat and
(A) Maize (B) Barley
(C) Rye (D) Bean
15. Piece of sterile plant tissue to be used for tissue culture under aseptic condition is
(A) Inoculant (B) Explant
(C) Clone (D) Somaclone
16. The genetically engineered crop which has been recently introduced in India is
(A) Herbicide tolerant maize
(B) Bt cotton
(C) Slow ripening tomato
(D) Golden rice
17. Somaclonal variations are produced
(A) By mutagens
(B) In tissue culture during differentiation
(C) By gamma rays
(D) By sexual reproduction
18. Introduction of foreign genes for improving genotype is
(A) Biotechnology (B) Tissue culture
(C) Vernalization (D) Genetic engineering

Exercise # 3**PART - 1****MATRIX MATCH COLUMN**

1. Match the names given under Column - I with their relations given under column - II, choose the answer which gives the correct combination of the alphabets of the two columns

Column - I**(Name)**

- (A) Bombyx mori
(B) Morus alba
(C) Grainage
(D) Powdery

- (A) A - q, B - r, C - s, D - t
(C) A - r, B - q, C - t, D - s

Column - II**(Relations)**

- (p) Disease of mulberry
(q) Centre where silkworm egg are produced and supplied
(r) Silk moth
(s) Mulberry plant
(t) Freshly hatched silkworm

- (B) A - r, B - s, C - q, D - p
(D) A - s, B - r, C - q, D - t

2. Match the following and select the correct answer

Column - I

- (A) Bears
(B) Snail
(C) Zooplanktons
(D) Seeds

- (A) A - 3, B - 4, C - 1, D - 2
(C) A - 4, B - 1, C - 2, D - 3
(E) A - 2, B - 4, C - 1, D - 3

Column - II

- (1) Diapause
(2) Hibernation
(3) Dormancy
(4) Aestivation

- (B) A - 1, B - 2, C - 4, D - 3
(D) A - 1, B - 4, C - 2, D - 3

3. Find the correct match

Column - A

- (I) Mackeral
(II) Honey bee
(III) Mirgala
(IV) Silkworm

(A) II and IV**Column - B**

- Rastrelliger
Apis
Tacchardia
Bombyx

(B) I and II**Column - C**

- Freshwater fish
Wax
Marine waterfish
Mulberry silk

(C) IV only**(D) I and III**

4. Match the terms given in Column - I with their descriptions given in Column - II and select the correct option from the codes given below.

Column - I

- (A) Out-crossing
(B) Interspecific hybridisation
(C) Cross-breeding
(D) Inbreeding

- (A) A - (ii), B - (iii), C - (iv), D - (i)
(C) A - (iv), B - (ii), C - (iii), D - (i)

Column - II

- (i) Mating of closely related individuals within the same breed
(ii) Mating of animals of same breed but having no common ancestors on either side of their pedigree for 4 - 6 generations.
(iii) Mating of animals of two different species
(iv) Mating of animals belonging to different breeds.

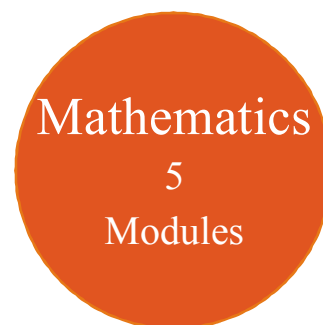
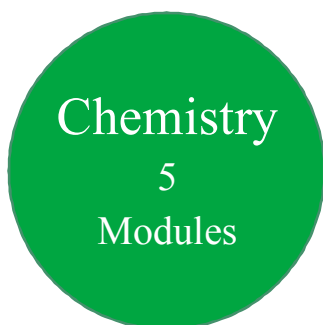
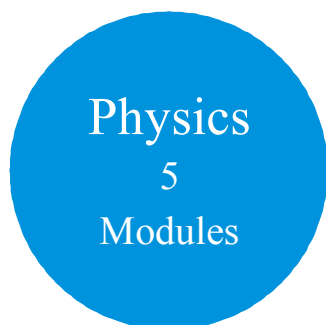
- (B) A - (iii), B - (ii), C - (iv), D - (i)
(D) A - (ii), B - (iv), C - (iii), D - (i)

Exercise # 4**PART - 1****PREVIOUS YEAR (NEET/AIPMT)**

1. One of the most important reason why wild plants should thrive is that these are good sources of
 - (A) Unsaturated edible oils
 - (B) Highly nutritive animals feed
 - (C) Genes for resistance to diseases and pests
 - (D) Rare and highly sought after fruits of medical importance
2. Which statement is correct about centre of origin of plants?
 - (A) More diversity in varieties
 - (B) Frequency of dominant gene is more
 - (C) Climatic conditions more favourable
 - (D) None of the above
3. Before the European invaders which vegetable was/were absent in India?
 - (A) Potato and tomato
 - (B) Simla mirch and brinjal
 - (C) Maize and chichinda
 - (D) Bitter gourd
4. What is the best pH of the soil for cultivation of plants?
 - (A) 3.4 - 5.4
 - (B) 6.5 - 7.5
 - (C) 4.5 - 8.5
 - (D) 5.5 - 6.5
5. Which of the following crops have been brought to India from New world?
 - (A) Cashewnut, potato, rubber
 - (B) Mango, tea
 - (C) Tea, rubber, mango
 - (D) Coffee
6. India's wheat yield revolution in the 1960s was possible primarily due to
 - (A) Hybrid seeds
 - (B) increased chlorophyll content
 - (C) Mutations resulting in plant height reduction
 - (D) quantitative trait mutations
7. The world's highly prized wool yielding 'Pashmina' breed is
 - (A) goat
 - (B) sheep
 - (C) goat-sheep cross
 - (D) Kashmir sheep-Afghan sheep cross
8. Which of the following is generally used for induced mutagenesis in crop plants?
 - (A) X-rays
 - (B) UV (260 nm)
 - (C) Gamma rays (from cobalt 60)
 - (D) Alpha particles
9. Why is vivipary an undesirable character for annual crop plants?
 - (A) It reduces the vigour of plant
 - (B) The seeds cannot be stored under normal conditions for the next season
 - (C) The seeds exhibit long dormancy
 - (D) It adversely affects the fertility of the plant
10. The name of Norman Borlaug is associated with
 - (A) Green revolution
 - (B) Yellow revolution
 - (C) White revolution
 - (D) Blue revolution
11. Three crops that contribute maximum to global food grain production are
 - (A) wheat, rice and maize
 - (B) wheat, maize and sorghum
 - (C) rice, maize and sorghum
 - (D) wheat, rice and barley
12. Triticale, the first man-made cereal crop, has been obtained by crossing wheat with
 - (A) Rye
 - (B) Pearl millet
 - (C) Sugarcane
 - (D) Barley
13. Crop plants grown in monoculture are
 - (A) Low in yield
 - (B) Free from intraspecific competition
 - (C) Characterised by poor root system
 - (D) Highly prone to pests
14. Golden rice is a transgenic crop of the future with the following improved trait
 - (A) High lysine (essential amino acid) content
 - (B) insect resistance
 - (C) high protein content
 - (D) high vitamin-A content
15. In order to obtain virus-free plants through tissue culture the best method is
 - (A) Meristem culture
 - (B) Protoplast culture
 - (C) Embryo rescue
 - (D) Anther culture
16. In maize, hybrid vigour is exploited by
 - (A) inducing mutations
 - (B) bombarding the protoplast with DNA
 - (C) crossing of two interbreed parental lines
 - (D) harvesting seeds from the most productive plants

1. Among the following edible fishes, which one is a marine fish having rich source of omega-3 fatty acids ?
(A) Mystus (B) Mangur (C) Mrigala (D) Mackerel
2. Interspecific hybridisation is mating of
(A) Animals within same breed without having common ancestors
(B) Two different related species
(C) Superior males and females of different breeds
(D) More closely related individuals within same breed for 4-6 generations
3. Outbreeding is an important strategy of animal husbandry because it
(A) Is useful in overcoming inbreeding depression
(B) Exposes harmful recessive genes that are eliminated by selection
(C) Helps in accumulation of superior genes
(D) Is useful in producing purelines of animals
4. One of the breeding techniques useful to eliminate harmful recessive genes by selection is
(A) Inbreeding (B) Artificial insemination
(C) MOET (D) Out-breeding
5. Hisardale is obtained by crossing
(A) Horse with donkey (B) Merino ewes with Bikaneri rams
(C) Superior bull with superior cow (D) Bikaneri ewes with Merino rams
6. Which of the statement about breeding is wrong
(A) By inbreeding purelines cannot be evolved.
(B) Continued inbreeding, especially close inbreeding reduces fertility and productivity
(C) Cross-breeding allows desirable qualities of two different breeds to be combined
(D) Inbreeding exposes harmful recessive genes that are eliminated by selection
(E) A single outcross often helps to overcome inbreeding depression
7. Apiculture is associated with which of the following groups of plants ?
(A) Grapes, maize, potato (B) Sugarcane, paddy, banana
(C) Guava, sunflower, strawberry (D) Pineapple, sugarcane, strawberry
8. Cattle fed with spoiled hay of sweet clover which contains dicumarol
(A) Are healthier due to a good diet
(B) Catch infections easily
(C) May suffer vitamin K deficiency and prolonged bleeding
(D) May suffer from beri beri due to deficiency of B vitamins
9. The scientific name of the moth which produce tasar is
(A) Bombyx mori (B) Antheraea mylitta
(C) Antheraea assamensis (D) Philosamia ricini
10. Which is correctly matched
(A) Sericulture – fish
(B) Aquaculture – mosquito
(C) Apiculture – honey bee
(D) Pisciculture – silk moth

11th Class Modules Chapter Details



PHYSICS	CHEMISTRY	BIOLOGY
<p>Module-1</p> <ol style="list-style-type: none"> Physical World & Measurements Basic Maths & Vector Kinematics <p>Module-2</p> <ol style="list-style-type: none"> Law of Motion & Friction Work, Energy & Power <p>Module-3</p> <ol style="list-style-type: none"> Motion of system of particles & Rigid Body Gravitation <p>Module-4</p> <ol style="list-style-type: none"> Mechanical Properties of Matter Thermal Properties of Matter <p>Module-5</p> <ol style="list-style-type: none"> Oscillations Waves 	<p>Module-1(PC)</p> <ol style="list-style-type: none"> Some Basic Concepts of Chemistry Atomic Structure Chemical Equilibrium Ionic Equilibrium <p>Module-2(PC)</p> <ol style="list-style-type: none"> Thermodynamics & Thermochemistry Redox Reaction States Of Matter (Gaseous & Liquid) <p>Module-3(IC)</p> <ol style="list-style-type: none"> Periodic Table Chemical Bonding Hydrogen & Its Compounds S-Block <p>Module-4(OC)</p> <ol style="list-style-type: none"> Nomenclature of Organic Compounds Isomerism General Organic Chemistry <p>Module-5(OC)</p> <ol style="list-style-type: none"> Reaction Mechanism Hydrocarbon Aromatic Hydrocarbon Environmental Chemistry & Analysis Of Organic Compounds 	<p>Module-1</p> <ol style="list-style-type: none"> Diversity in the Living World Plant Kingdom Animal Kingdom <p>Module-2</p> <ol style="list-style-type: none"> Morphology in Flowering Plants Anatomy of Flowering Plants Structural Organization in Animals <p>Module-3</p> <ol style="list-style-type: none"> Cell: The Unit of Life Biomolecules Cell Cycle & Cell Division Transport in Plants Mineral Nutrition <p>Module-4</p> <ol style="list-style-type: none"> Photosynthesis in Higher Plants Respiration in Plants Plant Growth and Development Digestion & Absorption Breathing & Exchange of Gases <p>Module-5</p> <ol style="list-style-type: none"> Body Fluids & Its Circulation Excretory Products & Their Elimination Locomotion & Its Movement Neural Control & Coordination Chemical Coordination and Integration

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12th Class Modules Chapter Details

Physics
5
Modules

Chemistry
5
Modules

Mathematics
5
Modules

PHYSICS	CHEMISTRY	BIOLOGY
<p>Module-1</p> <ol style="list-style-type: none"> 1. Electrostatics 2. Capacitance <p>Module-2</p> <ol style="list-style-type: none"> 1. Current Electricity 2. Magnetic Effect of Current and Magnetism <p>Module-3</p> <ol style="list-style-type: none"> 1. Electromagnetic Induction 2. Alternating Current <p>Module-4</p> <ol style="list-style-type: none"> 1. Geometrical Optics 2. Wave Optics <p>Module-5</p> <ol style="list-style-type: none"> 1. Modern Physics 2. Nuclear Physics 3. Solids & Semiconductor Devices 4. Electromagnetic Waves 	<p>Module-1(PC)</p> <ol style="list-style-type: none"> 1. Solid State 2. Chemical Kinetics 3. Solutions and Colligative Properties <p>Module-2(PC)</p> <ol style="list-style-type: none"> 1. Electrochemistry 2. Surface Chemistry <p>Module-3(IC)</p> <ol style="list-style-type: none"> 1. P-Block Elements 2. Transition Elements (d & f block) 3. Co-ordination Compound 4. Metallurgy <p>Module-4(OC)</p> <ol style="list-style-type: none"> 1. HaloAlkanes & HaloArenes 2. Alcohol, Phenol & Ether 3. Aldehyde, Ketone & Carboxylic Acid <p>Module-5(OC)</p> <ol style="list-style-type: none"> 1. Nitrogen & Its Derivatives 2. Biomolecules & Polymers 3. Chemistry in Everyday Life 	<p>Module-1</p> <ol style="list-style-type: none"> 1. Reproduction in Organisms 2. Sexual Reproduction in Flowering Plants 3. Human Reproduction 4. Reproductive Health <p>Module-2</p> <ol style="list-style-type: none"> 1. Principles of Inheritance and Variation 2. Molecular Basis of Inheritance 3. Evolution <p>Module-3</p> <ol style="list-style-type: none"> 1. Human Health and Disease 2. Strategies for Enhancement in Food Production 3. Microbes in Human Welfare <p>Module-4</p> <ol style="list-style-type: none"> 1. Biotechnology: Principles and Processes 2. Biotechnology and Its Applications 3. Organisms and Populations <p>Module-5</p> <ol style="list-style-type: none"> 1. Ecosystem 2. Biodiversity and Conservation 3. Environmental Issues

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