STRATEGIES FOR ENHANCEMENT IN FOOD PRODUCTION

1. The cultivation of aquatic animals or plants for food is called
   a) Aquaculture b) Pisciculture c) Sericulture d) Apiculture
2. Differentiation of organs and tissues in a developing organism is associated with
   a) Developmental mutations b) Differential expression of genes
   c) Lethal mutations d) Deletion of genes
3. Triticale is obtained by crossing wheat with:
   a) Oat b) Barley c) Maize d) Rye
4. Essential oils are made of:
   a) Vitamins b) Auxins
   c) Trace elements d) Aromatic volatile organic substances
5. Mule is produced by
   a) Inbreeding b) Artificial insemination
   c) Interspecific hybridization d) Intraspecific hybridization
6. Rearing and breeding of fish in ponds, tanks and artificial reservoirs is called:
   a) Aquaculture b) Fishing c) Pisciculture d) Apiculture
7. Bee wax is a product of ..... importance
   a) Industrial b) Domestic c) Medicinal d) All of these
8. In 1963 during green revolution the increase in crop production of wheat was due to the introduction of
   a) Semi-dwarf varieties of wheat
   b) Jaya and Ratna
   c) Both (a) and (b)
   d) Sonalika and Kalyan Sona
9. Safflower oil is obtained from the seeds of:
   a) *Linum usitatissimum* b) *Lelianthus annus*
   c) *Sesamum indicum* d) *Carthamus tinctorius*
10. Which of the following is the main aim of evaluation of germplasm in plant breeding program?
    a) To identify plants with desirable combination of characters
    b) For effective exploitation of the natural genes
    c) Both (a) and (b)
    d) For collection of variability
11. Spawning in fishes can be induced by:
    a) TSH b) Thyroxine c) FSH and LH d) STH
12. An old breeding technique is:
    a) Introduction b) Selection c) Mutation breeding d) Hybridisation
13. The botanical name for groundnut is:
    a) *Indigofera tinctoria* b) *Crotolaria juncea*
    c) *Arachis hypogea* d) *Astragalus gummifer*
14. *Saccharum barberi* was/is grown in
    a) East India b) West India c) North India d) South India

15. Need for breeding plants, to improve food quality are
I. lack of adequate food having adequate nutritional requirements in the world
II. majority people are unable to buy enough fruits, vegetables, legumes, fish and meat and thus suffer from deficiencies or hidden hunger
III. essential micronutrients are absent from diet
Choose the correct option

a) I and II b) I and III c) II and III d) I, II and III

16. Mating between two individuals differing in genotypto produce genetic variation is called
a) Domestication b) Incubation c) Hybridization d) Mutation

17. The cotton fibre from the cotton plant is obtained from:
a) Roots b) Stems c) Seeds d) Leaves

18. The cheapest high energy crop of India is:
a) Apple b) Guava c) Mango d) Banana

19. Emasculation of flowers is carried out through removal of:
a) Sigma b) Sepals and petals c) Anthers d) Entire organism

20. In protoplast fusion, the enzymes required are
a) Cellulose, hemicellulose, pectinase
b) Pectinase
c) Ligase, hemicellulose
d) Hemicellulose

21. Cows and buffaloes remain in heat for:
a) 24-36 hours b) 36-48 days c) 7-10 days d) 15-20 days

22. According to NCERT text, which of the following are selection and testing of superior recombination in plant breeding?
a) It involves selection of plants amont the progeny of the hybrids with desire combination of characters
b) The hybrid are superior to both the parents this is called hybrid vigour
c) They are self-pollinated for several generations till they rich a stable of uniformily or homozygosity in order to ovoid the segregation of characters in the future progeny
d) All of the above

23. Which of the following shows correct chronological order of the events occurring during callus culture?
a) Callus → Cell division → Explant → Addition of cytokinin → Cells acquire meristematic property
b) Explant → Cell division → Addition of cytokinin → Cells acquire meristematic property
c) Explant → Cell division → Callus → Addition of cytokinin → Cells acquire meristematic property
d) Callus → Explant → Cell division → Addition of cytokinin → Cells acquire meristematic property

24. Which of the following organisms is useful for us?
a) *Musca* b) *Bombyx* c) *Pheretima* d) *Periplaneta*

25. The part of the grain in cereals, where much of the protein lies is the:
a) Aleurone b) Endosperm c) Pericarp d) Embryo

26. In crop improvement programme haploids are important because they:
a) Require one half of nutrients
b) Are helpful in study of meiosis
c) Grow better under adverse conditions
d) Form perfect homozygous individuals on diploidisation

27. The honey bees exhibit a type of dance to communicate the location of food. This is known as:
a) Tap dance b) Round dance and waggling dance
c) Break dance d) Waggle dance

28. The plant cell without the cell wall is called
a) Protoplast b) Cytoplast c) Nucleoplast d) None of these

29. The capacity of a cell explant to grow into a whole plant is called

a) Plant culture b) Tissue culture c) Cellular totipotency d) All of these

30. Close inbreeding usually results in reduction of fertility and productivity. This is called
a) Homozygosity b) Outbreeding
c) Inbreeding depression d) Outbreeding depression

31. Read the given statement about outcrossing
I. It is the breeding between of animals with in the same breed but do not have common ancestors on either side of their pedigree up to 4-6 generation
II. It is done to increase milk production and growth rate in animals
Which of the statement given above is incorrect?
a) Only I b) Only II c) I and II d) None of these

32. ..... is a phenomenon by which genetic variations is achieved through changes in the base sequences with in genes, which creates a new character or trait absent in parental generation
a) Apomixis b) Mutation c) Mutation breeding d) Heterosis

33. Methods of breeding for acquiring disease resistance are
I. conventional breeding techniques
II. mutation breeding
III. radiation breeding
Chose the correct option
a) I and II b) I and III c) I only d) III only

34. Word livestock refers to
a) Sheep and goat only b) Pigs and camels only
c) Cattle and buffaloes only d) All of these

35. The animal most useful on difficult terrains is:
a) Mule b) Yak c) Camel d) Elephant

36. Which of the following statement are the main objective of animals breeding?
I. improved growth rate
II. increased production of milk, meat, egg, wool, etc.
III. superior quality of milk, meat eggs wool, etc.
IV. improved resistance to various disease
Choose the correct option
a) I and II b) I, II and III c) II, III and IV d) I, II, III and IV

37. A beast of burden which needs little care is:
a) Pig b) Donkey c) Mule d) Yak

38. Isinglass, a type of byproduct of fish industry is principally used for
a) Feeding cattle, pigs and poultry
b) Preparation of paints and varnishes
c) Clarification of vinegar, wines and beer
d) Production of insulin

39. The enzyme used for isolation of single cell from explant/cell is
a) Pectinase b) Catalase c) Ligninase d) Maltase

40. The parameters carried out for managing dairy farm are
I. selection of both the male and female animals having high yielding potential and resistance to diseases
II. regular visits by a veterinary doctor
III. each animal should be fed on a balance ratio
IV. pay attention to good animal management and general supervision
Which of the above statement are correct?
a) I and II b) I, II and III c) II, III and IV d) I, II, III and IV

41. Ambergis is the secretion from the intestine of ..... used in the manufacture of perfumes and other cosmetics:
a) Tachyglossus-*Echidna* b) Physetter-Sperm whale

c) Musk-Deer d) Kangaroo-*Macropus*

42. *Hisardale* is a new breed of ...A... developed in Punjab by crossing ...B... and ...C... .
Here A and C refers to
a) A-sheep, B-Bikaneri ewes, C-Marino rams b) A-chicken, B-Dorking, C-Sussex
c) A-chicken, B-leghorn, C-Plymouth rock d) A-cow, B-Jersy, C-Brown swis

43. Economic importance of fish includes
I. fish as food
II. source of income
III. aesthetic value
Which of the above are correct?
a) I and II b) I and III c) II and III d) I, II and III

44. Lysine and tryptophan are
a) Proteins
b) Non-essential amino acids
c) Essential amino acids
d) Aromatic and no acids

45. Which of the following disease resistance enhancement introduced by mutation in moong bean?
I. Yellow mosaic virus
II. Powdery mildew
III. Black rust
Choose the correct option
a) I and II b) I and III c) II and III d) I, II and III

46. The conventional method of breeding for resistance includes
I. screening the germplasm for resistant sources
II. hybridization of selected parents
III. selection and evaluation of the hybrids
IV. testing and release of new varieties
Choose the correct option
a) I, II and III b) I, III and IV c) II, III and IV d) I, II, III and IV

47. The primary aim of animal breeding is to breed such animals which are able to produce
a) Qualitative increase in the product
b) Quantitative increase in the product
c) Marketing of animal product
d) Both (a) and (b)

48. The scientific name of maize is:
a) Zingiber b) *Zea mays* c) Raphanus d) Daucas

49. What is the outcome of increased resistance power in crops?
I. Enhance production
II. Reduces the dependence on fungicides and bacteriocides
III. Reduces the dependence on technical agricultural tools
Choose the correct option
a) I and II b) I and III c) II and III d) I, II and III

50. The insect that is not found in the wild state is:
a) Lac insect b) Cochineal insect c) Honey bee d) Silk moth

51. Aim of plant breeding is to grow
a) Disease free varieties b) High-yielding varieties
c) Early-maturing varieties d) All of the above

52. Which of the following is not an oil seed?
a) *Helianthus annus* b) *Cocos nucifera* c) *Arachis hypogea* d) *Phaseolus aureus*

53. Improved varieties of wheat suitable for Indian environment have been developed by

a) Euploidy and cloning
b) Hybridization and mutation
c) Polyploidy and hybridization
d) Cloning and polyploidy

54. ..... is used in the manufacture of many items including cosmetics, shaving creams and polishes of various kinds. The most appropriate word for filling the blank is
a) Bee wax b) Honey c) Latex d) Resin

55. A milch breed of cow is:
a) Haryana b) Malvi c) Kankrej d) Halliker

56. ..... is an industry that includes catching processing or selling of aquatic animals
a) Fisheries b) Apiculture c) Sericulture d) None of these

57. The embryo which develops from somatic cell is called
a) Somatic embryo
b) Reproductive embryo
c) Clone embryo
d) None of these

58. Hinny is a cross breed between:
a) Male donkey and female horse
b) Female donkey and male horse
c) Male mule and female horse
d) None of these

59. Science of altering the genetic pattern of plants in order to increase their value and utility for human welfare is called
a) Plant breeding b) Agriculture c) Plant genetics d) All of these

60. Which one of the following is the American poultry breed?
a) Australorp b) Rhode Island Red c) Minorca d) Aseel

61. Compared to a bull a bullock is docile because of:
a) Higher levels of cortisone
b) Lower levels of blood testosterone
c) Lower levels of adrenalin/noradrenalin in its blood
d) Higher levels of thyroxina

62. Maximum cocoon and raw silk production is in:
a) China b) Japan c) U.S.S.R d) Brazil

63. Which of the following is a disease resistant, high yielding breed of the poultry developed in Karnataka?
a) Aseel b) White leghorn c) Giriraja d) Plymoth rock

64. Which one of the following products of apiculture is used in cosmetics and polishes?
a) Honey b) Oil c) Wax d) Royal jelly

65. Semi-dwarf varieties of rice were developed from
a) IR-8 b) Taichung Native-1 c) Both (a) and (b) d) Jaya and Ratna

66. Largest silk producing state of India is:
a) Karnataka b) Bihar c) Assam d) West Bengal

67. Larval form of silk moth is called:
a) Naiad b) Maggot c) Caterpillar d) Wriggler

68. Bhutia is a breed of:
a) Chicken b) Goat c) Sheep d) Horse

69. Which of following species is specially domesticated and reared for high economic importance?
a) *Apis indica* b) *Apis mellifera* c) *Apis dorsata* d) *Apis florea*

70. Passive, non-locomotory and non-feeding stage in life history of Silk moth is:
a) Caterpillar b) Imago c) Nymph d) Pupa

71. Regulations governing movement of diseased plant material are called:
a) Crop protection b) Quarantine c) Plant regulation d) Rotation

72. The larger distribution of clean quality milk all the world over can be said to be due to the great work of:
a) Robert Koch b) Leeuwenhoek c) Louis Pasteur d) Blackmann

73. Teak is obtained from plant:
a) *Shorea robusta* b) *Mangifera indica* c) *Tectona grandis* d) *Cedrus deodora*

74. Which of the following is not a true pulse crop?

a) *Vicia faba* b) *Phaseolus aureus* c) *Cassis fistula* d) *Cajanus cajan*

75. In tissue culture, roots can be induced by
    a) Lower concentration of cytokinin and higher concentration of auxins
    b) Only cytokinin and no auxins
    c) No cytokinin and only auxins
    d) Higher concentration of cytokinin and lower concentration of auxins
76. Blue revolution
    I. It is the rapid expansion intensive commercial aquaculture
    II. Increase global food production and reduce widespread hunger
    Which of the statements given above is/are correct?
    a) Only I b) Only II c) I and II d) None of these
77. Cryopreservation is useful for:
    a) Preservation of semen b) Very young foetuses
    c) Living cells and body parts d) All the above
78. Keeping beehives in crop field during flowering period increases
    a) Honey and wax yield b) Crop yield c) Both (a) and (b) d) Pollination in wheat
79. New varieties of plants can be produced by:
    a) Selection and hybridization
    b) Subjecting them to very heavy dose of radiation
    c) Subjecting them to doses of radiation and selection
    d) Subjecting them to continuous radiation
80. Hidden hunger can be defined as
    a) Majority people are unable to buy enough fruits, vegetables, legumes, fish and meat and thus suffer from deficiency
    b) People are unable to buy healthy drink item and thus suffer from deficiency
    c) People are unable to buy vitamin and minerals medicines and thus suffer from deficiency
    d) All of the above
81. Pure line breeds refer to:
    a) Homozygosity and independent assortment b) Homozygosity only
    c) Heterozygosity d) Heterozygosity and linkage
82. International Rice Research Institute (IRRI) is situated at
    a) New York (USA) b) Tokyo (Japan) c) Manilla (Philipines) d) Hydrabad (India)
83. Pomato is a somatic hybrid of
    a) Potato and onion b) Potato and tomato c) Potato and brinjal d) Potato and garlic
84. Real product of apiculture is
    a) Honey b) Bee wax c) Both (a) and (b) d) Sugar
85. Protoplasts of two different species are fused in
    a) Miropropagation b) Somatic hybridization
    c) Clonal propagation d) Organography
86. The largest groundnut producing country is:
    a) U.S.A. b) Brazil c) India d) Burma
87. A breeder evolving disease resistant variety will start with:
    a) Working out yield of different varieties b) Go through the subject in library
    c) Selection of parents d) Hybridisation
88. Which one of the following is the source of silk?
    a) Eggs b) Caterpillar c) Cocoon d) Pupa
89. Self pollination results in:
    a) Heterosis b) Hybridisation
    c) Polyploidy d) Inbreeding depression
90. "Jaya" and "Ratna" developed for green revolution in India are the varieties of:

a) Maize b) Rice c) Wheat d) Bajra

91. Animal husbandry deals with
I. breeding of livestock buffaloes, cows, sheep, camels, etc., that are useful to humans
II. rearing, catching, selling, etc., of fish, molluscs and crustaceans
III. breeding of fowls for human use
Which of the statement give above are correct?
a) I and II b) I and III c) II and II d) I, II and III

92. Rate of mutations is induced by means of certain agents called
a) Mutagens b) Carcinogen c) Oncogenes d) None of these

93. Which statement is correct about centre of origin of plant?
a) More diversity in improved variety b) Frequency of dominant gene is more
c) Climatic condition more favourable d) None

94. Consider the following statements
I. Breeding of animal is very important for animal husbandry
II. Both the male and female animals selected for breeding should be of superior quality
III. The word 'husbandry' means the management of domestic affair
IV. In our country, poultry mainly means chickens, domesticated for egg
V. Cows and buffaloes generally give more milk than goats and sheep
VI. The yellow colour of buffalo milk is due to carotene
Which of the statement given above are true and which are false?
I II III IV V VI
a) F F T T F F b) T T F F T F c) T T T F T F d) F T F T T F

95. Emasculation is removal of:
a) Stigma from flower of male parent b) Calyx from flower of male parent
c) Calyx from flower of female parent d) Stamens from flowers of female parent

96. Lac is:
a) Excretion of lac insect b) Dead body of lac insect
c) Body secretion of lac insect d) None of the above

97. The most common egg-type variety used for commercial production through out the world is
a) Leghorn b) Plymoth rock c) Cornish d) New Hampshire

98. In livestock breeding experiments which of the following stage is transferred to surrogate mothers
a) Unfertilized eggs b) 2 celled embryo
c) Fertilised egg d) 8 to 32 celled embryo

99. High yielding variety of rice is:
a) Dhann b) IR-8 c) *Tripsacum* d) *Digitaria*

100. A tool in crop improvement involving identification of genes, transfer and integration is:
a) Protoplast fusion and tissue culture b) Somaclonal hybridisation
c) Gene bank technology d) Genetic engineering

101. The part of the plant taken for tissue culture is called
a) Inplant b) Explant c) Transplant d) Both (b) and (c)

102. Which one is a rich source of vitamin-A?
I. Carrot II. Lemon
III. Beans IV. Spinach
Choose the correct option
a) I and II b) I and III c) I and IV d) I, II, III and IV

103. A group of animals which are related by descent and share many similarities are referred to as
a) Breed b) Race c) Variety d) Species

104. A good germplasm collection is essential for
a) A successful breeding programme
b) Hybridization

c) Selection of plant
d) Emasculation

105. The milch breeds of cattle are?
a) Mallikar, Nageri and Malvi
b) Gir, Sahiwal and Deoni
c) Kankrej, Haryana and Ongole
d) Tharparkar and Kangayam

106. Which one is the best silk?
a) Eri silk
b) Mulberry silk
c) Tasar silk
d) None of the above

107. In order to obtained disease free plants through tissue culture methods the best techniques is
a) Embryo culture
b) Protoplast culture
c) Meristem culture
d) Anther culture

108. Which one of the following combination would a sugarcane farmer look for in the sugarcane crop?
a) Thick stem, long internodes, high sugar content and disease resistant
b) Thick stem, high sugar content and profuse flowering
c) Thick stem, short internodes, high sugar content, disease resistant
d) Thick stem, low sugar content, disease resistant

109. Hardening in tissue culture is
a) Keeping 30°-50°C temperature for about 30 minutes
b) Acclimatization of tissue culture plants slowly before growing in the field
c) Plunging the vials into water at 37°-40°C
d) None of the above

110. Fibre yielding plant is:
a) *Triticum*
b) *Gossypium*
c) *Pennisetum*
d) *Rauwolfia*

111. A draught breed of cattle is:
a) Red Sindhi
b) Gir
c) Malvi
d) Haryana

112. In plant breeding programmes, the entire collection of (plants/seeds) having all the diverse alleles for all genes in a given crop is called:
a) Cross-hybridisation among the selected parents
b) Evaluation and selection of parents
c) Germplasm collection
d) Selection of superior recombinants

113. Mutation breeding is carried out by
I. inducing mutations in plants by various means
II. screening the plant for resistance
III. selecting the desirable plant for multiplication and breeding
Choose the correct option
a) I and II
b) I and III
c) II and III
d) I, II and III

114. *Saccharum barberi* was grown in ...A... India had ...B... sugar content and yield. *Saccharum officinarum* did grow in ...C... India, had thicker stem and ...D... sugar content. Here A to D refers to
a) A-North, B-poor, C-South, D-higher
b) A-South, B-higher, C-North, D-poor
c) A-East, B-poor, C-West, D-higher
d) A-West, B-higher, C-North, D-poor

115. Which one of the following is not an important Indian millet?
a) *Sorghum vulgare*
b) *Pennisetum typhoides*
c) *Eleusine coracana*
d) None of the above

116. Murrah is a breed of:
a) Cow
b) Sheep
c) Buffaloes
d) Goat

117. Solid stem in wheat exhibits non-preference by
a) Jassids
b) Fruit borer
c) Stem borer
d) Stem sawfly

118. Pearl oyster belongs to class:
a) Gastropoda
b) Pelecypoda
c) Scaphopoda
d) Amphineura

119. Artificial insemination is better than natural insemination in cattle because:
a) Semen of good bulls can be provided everywhere

b) There is no likelihood of contagious diseases
c) It is economical
d) All the above

120. The dry fibrous residue left after the extraction of sugarcane juice is known as:
a) Molasses b) Bagasse c) Massecuite d) None of the above

121. In 1960 to 2000 wheat production increased from ...A... tonnes to ...B... tonnes while rice production was from ...C... tonnes to ...D... tonnes
Here A to D refers to
a) A-11 million, B-75 million, C-35 million, D-89.5 million
b) A-14 million, B-80 million, C-40 million, D-92.5 million
c) A-10 million, B-71 million, C-35 million, D-89.5 million
d) A-15 million, B-70 million, C-40 million, D-90 million

122. Emasculation is related to
a) Pureline b) Mass selection c) Clonal selection d) Hybridization

123. It is now possible to breed plants and animals with desired characters through:
a) Ikebana technique b) Tissue culture
c) Genetic Engineering d) Chromosome Engineering

124. Common wild rock honey bee is:
a) *Apis mellifera* b) *Apis indica* c) *Apis dorsata* d) *None of the above*

125. Anatomically, cotton fibres are:
a) Bast fibres b) Xylem fibres c) Epidermal hairs d) Pith cells

126. Which of the following is considered as the root of any breeding program
a) Genetic variability b) Cross hybridization c) Hybrid vigour d) Heterosis

127. 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

128. *Triticale* has been developed through intergeneric hybridization between:
a) Wheat and Rye/*Secale* b) Wheat and *Aegilops*
c) Wheat and Rice d) Rice and Maize

129. In tissue culture method, the embryoids formed from pollen grain is called
a) Cellular totipotency b) Organogenesis c) Triple fusion d) Callus culture

130. Microbes like *Spirulina* can be grown on material like
I. waste water from potato processing plants
II. straw
III. animal manure and sewage
IV. molasses
Choose the correct option
a) I and II b) I, II and III c) II, III and IV d) I, II, III and IV

131. Technique of silk production from the cocoons of silkworms was first known to:
a) India b) China c) United Kingdom d) U.S.A.

132. Indian rubber tree belongs to:
a) Euphorbiaceae b) Malvaceae c) Tiliaceae d) Moraceae

133. The controlled breeding and rearing of fish is called
a) Aquaculture b) Pisciculture c) Sericulture d) Apiculture

134. The hexaploid wheat species from which modern types of wheat have been developed:
a) *Triticum boeticum* b) *Triticum spelta* c) *Triticum aestivum* d) *Triticum squarrosa*

135. Wonder wheat is new wheat variety developed by
a) Mexico's International Wheat and Maize Improvement Centre

b) Indian National Botanical Research Institute
c) Australian Crop Improvement Centre
d) African Crop Improvement Centre

136. Somatic hybridization is a technique of
a) Natural breeding b) Natural pollination c) Artificial pollination d) Artificial breeding

137. Some plants developed by meristem culture are
a) Banana b) Sugarcane c) Potato d) All of these

138. Culturing of isolated plant organ is called
a) Explant culture b) Inplant culture c) Organism culture d) Organ culture

139. A man-made allopolyploid cereal crop is
a) *Hordeum vulgare* b) *Triticale* c) *Raphanobrassica* d) *Zea mays*

140. Honey
I. is a natural valuable tonic for human body
II. contains various substances of high medicinal value, including important enzymes, vitamins and disaccharide sugars mainly glucose and fructose
III. a number of ayurvedic medicines are taken with honey
Which of the statement given above are correct?
a) I and II b) I and III c) II and III d) I, II and III

141. Cereals and millets are mainly deficient in which type of amino acids
a) Sulphur containing amino acids-methionine and cysteine
b) Tryptophan
c) Both (b) and (c)
d) Lysine

142. Which one of the following is a disease of poultry?
a) Foot and mouth disease b) Pebrine disease
c) Anthrax d) Ranikhet disease

143. Through which method more numbers of female plants can be produced in papaya?
a) Spraying ethephon b) Genetic engineering c) Polyploidy breeding d) Tissue culture

144. Callus can form shoot or root by changing ratio of:
a) Auxin to gibberellin b) Auxin to cytokinin
c) Cytokinin to ethylene d) Gibberellins to cytokinin

145. Gestation period for buffalo is:
a) 9 months b) 14 months c) 10 months d) 21-22 months

146. In tissue culture, single germinating pollen grain will form a ..... plant
a) Diploid b) Haploid c) Triploid d) Tetraploid

147. The scientific name of lac insect is:
a) *Tachardia lacca* b) *Bombyx mori* c) *Cimex lectularis* d) *Pediculus pithiris*

148. In case of plant breeding cross hybridization is a time consuming and tedious process because
a) Pre-existing genetic variability is collected from wild varieties, species and relatives of the cultivated crop species
b) It involves the selection of plants among the progeny of the hybrids with desired combonation of characters
c) In involves emasculation and bagging techniques to transfer desired pollen grains to a desired plant
d) Both (a) and (b)

149. The germplasm collections are usually maintained at a ...A... temperature in the form of ...B... . Here A and B refers to
a) A-low, B-plant b) A-low, B-seed c) A-high, B-plant d) A-high, B-seed

150. Tassar silk moth belongs to the family:
a) Bombycidae b) Sturnidae c) Hymenoptera d) Diptera

151. GDP stands for

a) Gross Domestic Product
b) Grant Domestic Payment
c) Grant Domestic Product
d) Gross Domestic Payment

152. The Indian Agricultural Research Institute, New Delhi has released several fortified vegetable crops that are rich in vitamins and minerals. These are
I. Vitamin-A enriched carrot, spinach, pumpkin
II. Vitamin-C enriched bitter gourd, bathua, mustard tomato
III. Iron and calcium enriched spinach and bathua
IV. Protein enriched broad beans, French bean, garden pea
Choose the correct option
a) I, II and III
b) I, III and IV
c) II, III and IV
d) None of these

153. The percentage of proteins in the egg white is:
a) 12%
b) 35%
c) 64%
d) 70%

154. Norin-10 gene of dwarfness in wheat was originated in
a) India
b) Japan
c) Mexico
d) USSR

155. Which one is not included in animal husbandry?
I. Poultry farming
II. Fish farming
III. Organic farming
IV. Molecular farming
Codes
a) I and II
b) I and III
c) II and III
d) III and IV

156. The inherent capacity of a cell to regenerate a new whole organism is called
a) Ontogeny
b) Totipotency
c) Phylogeny
d) Proliferation

157. The botanical name of sweet flag, commonly used as antispasmodic, expectorant and remedies for asthma and chronic diarrhoea is:
a) *Berberis aristaat*
b) *Ferula asafoetida*
c) *Acorus calamus*
d) *Gentiana lutea*

158. In India the best aquarium is located at:
a) Z.S.I. Kolkata
b) Tarapur, Mumbai
c) Chennai
d) Vishakhapatnam

159. The method of growing or producing thousands of plants through tissue culture is called
a) Totipotency
b) Somaclones
c) Micropropagation
d) Macropropagation

160. In mutation breeding, mutations are induced by using chemical like
a) Aniline
b) Alcohol
c) Graphene
d) Both (a) and (b)

161. Improved varieties of wheat suitable for Indian climates have been developed by:
a) Hybridisation and mutation
b) Mutation and cloning
c) Cloning of polyploids
d) Polyploidy and hybridisation

162. *Spirulina* is a
a) Cyanobacteria
b) Fungi
c) Protozoan
d) Brown algae

163. The method maximum used in cattle breeding is:
a) Random breeding
b) Artificial insemination
c) Controlled breeding
d) Super ovulation and embryo transplant

164. The nutrient medium for tissue culture should have
I. sucrose
II. inorganic salts
III. growth regulators
IV. vitamins
V. amino acids
Choose the correct option
a) I, II, III, IV and V
b) II, III, IV and V
c) I, II, III and IV
d) I, II, IV and V

165. Which of the following plants is an oil as well as fibre yielding crop?
a) *Linum usilatissum*
b) *Sesamum indicum*
c) *Helianthus annus*
d) *Brassica juncea*

166. Choose breeding
I. refer to the cross of superior male of one breed with superior female of another breed
II. it helps of accumulate the desirable genes of the two breeds into a progeny
III. the progeny may be used for commercial production
Which of the statements given above are correct?
a) I and II b) I and III c) II and III d) I, II and III

167. Which one of following is our indigenous breed of chicken?
a) Plymouth Rock b) White Leghorn c) Aseel d) Rhode Island Red

168. Strategic steps for inbreeding are
I. identify superior male and superior female of the same breed
II. these are than mated in pair
III. evaluate the progeny obtained from the mating to identify superior males and females
IV. In cattle superior female is the cow or buffalo that produce more milk per lactation and superior male is the bull that gives rise to superior progenies
V. Superior progenies obtained are further mated
Arrange the above given steps in correct sequence and select the correct answer
a) I → III → II → IV → V b) I → II → III → IV → V
c) III → I → II → IV → V d) III → II → I → V → IV

169. Single cell protein is an alternative protein source for animal and human nutrition formed from certain beneficial microorganisms like
a) *Spirulina* b) *Methylophilus methylotrophus*
c) *Candida utilis* d) All of the above

170. The scientific process by which crop plants are enriched with certain desirable nutrients is called
a) Crop protection b) Plant breeding c) Biofortification d) Bioremediation

171. Central Food Technological Research Institute is located at:
a) Izatnagar b) Lucknow c) Dehradun d) Mysore

172. Hairy leaves of many plants are associated with providing resistance from
a) Insect pests b) Bacteria c) Virus d) Bollworm

173. Best method to increase crop yield is (*e.* g. wheat)
a) Using tractors b) Sowing seeds of improved varieties
c) Eradication of weeds d) Reduce ration holders

174. A superior female, in the case of cattle is the ...A... that produces more milk per lactation. On the other hand, a superior ...B... is that ...C... which gives rise to ...D... as compared to those of other males. Here A and D refers to
a) A-cow, B-male, C-bull, D-superior progeny
b) A-buffalo, B-male, C-bull, D-inferior progeny
c) A-cow, B-male, C-bull, D-inferior progeny
d) A-cow, B-male, C-bull, D-normal progeny

175. Natural silk contains:
a) Potassium b) Phosphorus c) Nitrogen d) Magnesium

176. The International Rice-8 (IR-8) has been introduced in India from:
a) Taiwan b) Philippines c) Mexico d) Japan

177. In maize, presence of high aspartic acid, low nitrogen and sugar content protect them from
a) Aphids b) Fruit borer c) Jassids d) Stem borer

178. The leaf juice of which one of the following plants is used for removal of opacity of cornea of the eye?
a) *Arachis hypogea* b) *Gossypium hirsutum*
c) *Atropa bellodona* d) *Rauwolfia serpentina*

179. Which one of the following is not a fungal disease?
a) Rust of wheat b) Smut of bajra
c) Black rot of crucifers d) Red rot of sugar cane

180. Sonalika and Kalyan Sona are the varieties of
a) Wheat b) Rice c) Millet d) Tobacco
181. The most commonly maintained species of bee by bee keepers is
a) *Apis mellifera* b) *Apis dorsata* c) *Apis indica* d) *Apis florae*
182. The oil used for the treatment of toothache is:
a) Clove oil b) Castor oil c) Mustard oil d) Coconut oil
183. Which of the following yield an aromatic essential oil used as antiseptic, a fly repellent and modifier in hair lotion?
a) Chicory b) *Calendula officinalis*
c) French marigold d) *Helianthus annus*
184. High-yielding and disease-resistant wheat varieties are
I. Sonalkia II. Kalyan Sona
III. Jaya IV. Ratna
Choose the correct option
a) I and II b) I and III c) II and III d) III and IV
185. In cotton, smooth leaf and absence of nector repel
a) Sawfly b) Bollworms c) Beetle d) Jassids
186. In crop improvement programmes, virus-free clones can be obtained through
a) Grafting b) Hybridization c) Embryo culture d) Shoot apex culture
187. Stilbesterol is used for:
a) Induction of lactation b) Artificial insemination
c) Super-ovulation d) Cryopreservation
188. The callus is not formed in
a) Tissue culture b) Suspension culture c) Clonal propagation d) Sexual reproduction
189. Which is the real product of Honey bee:
a) Honey b) Pollen c) Beewax d) Propolis
190. The technique of regeneration of whole plant from any part of a plant by growing it on a suitable culture under aseptic/sterile conditions *in vitro* is called
a) Tissue culture b) Plant culture c) Callus culture d) Seed culture
191. Inbreeding is carried out in animal husbandry because it
a) Increases vigour b) Improves the breed
c) Increases heterozygosity d) Increases homozygosity
192. Identify the edible marine fish
a) Hilsa b) Pomfret c) Both (a) and (b) d) Catla
193. Which of the following countries has maximum average annual milk yield per cow?
a) United Kingdom b) U.S.A c) Denmark d) India
194. Which of the following is a dual purpose breed?
a) Sindhi b) Deoni c) Jersey d) Sahiwal
195. The animals that we would expect in a dairy are
a) Cows b) Buffaloes c) Sheep and goats d) All of these
196. Quarantine regulation is meant for:
a) Preventing entry of diseased plants/pathogen/wild plants in the country
b) Spraying diseased plants with insecticides
c) Promoting dry farming
d) Growing fruit trees in all the states
197. Androgenic haploids were produced from anther culture for the first time by:
a) Bateson b) Ninan
c) Auerbach and Stadler d) Guha and Maheshwari
198. Gram belongs to family:
a) Leguminoseae b) Gramineae c) Ranunculaceae d) Solanaceae

199. In MOET procedure to induce follicular maturation and super-ovulation which of the following hormones are administered to the cow
a) Follicle stimulating hormone b) Progesterone
c) Androgen d) Oxytocin

200. Best source for dietary protein for a vegetarian is:
a) Soya Bean b) Gram c) Groundnut d) Milk

201. The various methods of crop improvement are
I. selection II. Hybridization
III. polyploidy IV. mutation breeding
V. genetic engineering
Choose the correct option
a) I, II, III, IV and V b) I, II, III and V c) II, III, IV and V d) I, III, IV and V

202. Indian Agriculture Research Institute is situated at:
a) Chennai b) New Delhi c) Bangalore d) Shillong

203. Apiculture means
a) Rearing of honey bees b) Rearing of silkworm c) Rearing of lac insect d) None of these

204. Ishingless is obtained from:
a) Liver of frog b) Scales of fishes c) Air bladder of fishes d) Skin of shark

205. The advantages of single cell proteins are
I. easy to grow
II. nutrient rich
III. high yield
Choose the correct option
a) I and II b) I and III c) II and III d) I, II and III

206. Meristem culture is practiced in horticulture to get
a) Somaclonal variation b) Haploids c) Virus-free plants d) Slow-growing callus

207. Examples of high-yielding and disease resistant wheat varieties are
a) Sonalika b) Kalyan Sona c) Both (a) and (b) d) Jaya

208. The length of silk fibre which surrounds a cocoon is about:
a) 800 to 1200 yards b) 8000 to 12000 yards
c) 800 to 1200 feet d) 8000 to 12000 metres

209. The objective of biofortification is to improve
I. protein content and quality
II. oil content and quality
III. vitamin content
IV. micronutrients and mineral content
Choose the correct option
a) I, II and III b) I, II and IV c) II, III and IV d) I, II, III and IV

210. Crop improvement is possible through:
a) Judicious combination of selection, introduction and hybridisation
b) Selection
c) Scientific improvement of cultivated plants
d) Introduction

211. Maize grain is rich in:
a) Niacin b) Thiamine c) Tryptophan d) Lysine

212. In callus culture, roots can be induced by the supply of
a) Auxin b) Cytokinin c) Gibberellin d) Ethylene

213. Semi-dwarf varieties of rice were developed from
I. IR-8 II. Taichung Native-1
III. Jaya IV. Sonalika

Choose the correct options

a) I and II b) II and III c) I and III d) III and IV

214. Percentage of proteins in the fish meal is:

a) 15-20% b) 25-50% c) 40-50% d) 55-70%

215. India's wheat yield revolution in 1960s was possible primarily due to

a) Increased chlorophyll content

b) Mutations resulting in plant height reduction

c) Quantitative trait mutations

d) Hybrid seeds

216. The plant from which chewing gum is made:

a) *Achras saptoa* b) *Euphorbia splendens*

c) *Dalbergia sissoo* d) *Butea frondosa*

217. Quinine is obtained from bark of:

a) *Cinchona* b) *Atropa belladona* c) *Magnifera indica* d) *Cedrella toona*

218. The largest land animal is:

a) Camel b) Elephant c) Rhino d) Python

219. The three major carps.—*Cattla*, *Labeo*, and *Cirhinus* grown in the same pond are due to:

a) There is no competition among them for the food material

b) Their feeding habits are different

c) They live in different habitats

d) None of the above

220. Silkworm spins its cocoon:

a) From inside to outside b) Outside to inside

c) Random d) Inside

221. Single cell proteins refers to

a) A specific protein extracted from pure culture of single type of cells

b) Sources of mixed proteins extracted from pure or mixed culture of organisms or cells

c) Proteins extracted from a single cell

d) A specific protein extracted from a single cell

222. Potato and tomato are native of:

a) Canada b) North America c) South America d) China

223. Which of the following is not an important characteristic of the green revolution?

I. Mechanised agriculture

II. Hybrid seeds

III. Slash and burn

Which of the above are correct?

a) Only I b) Only II c) Only III d) I and III

224. A hybrid where the cytoplasm of two parent cell are fused by retaining only one parental nucleus is called

a) Asymmetric somatic hybrid b) Cytoplasmic hybrid

c) An interbreed d) Symmetric somatic hybrid

225. Fibres are made of:

a) Parenchyma b) Chlorenchyma c) Sclerenchyma d) Collenchyma

226. The deficiency of essential micronutrients specially iron, iodine, zinc and vitamin-A in food

I. increases risk for disease

II. reduces mental ability

III. reduces life span

Choose the correct option

a) I, II and III b) I and III c) Only d) I and II

227. For producing protoplasts from pant cells, which of the following are required?

a) Amylase and pectinase b) Cellulase and proteinase

c) Cellulase and pectinase
d) Cellulase and amylase

228. The plants produced from tissue culture are genetically identical to the original plant from which they are grown so they are called
a) Somaclones
b) Clones
c) Para clones
d) None of these

229. 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

230. Two temperate cereals, sometimes cultivated at high altitude in the tropics, are:
a) *Avena sativa* and *Secale cereale*
b) *Zea mays* and *Eleusine coracana*
c) *Panicum milaceum* and *Coix lachrayma*
d) *Sorghum bicolour* and *Panicum milaceum*

231. Gambusia is a:
a) Predator on mosquito larvae
b) Pest of fishes
c) Parasite on crab
d) Pathogenic protozoan

232. Sugar obtained from sugarcane is:
a) Fructose
b) Glucose
c) Sucrose
d) Galactose

233. When cross is made between two species of the same genus, then the cross is known as
a) Intraspecific hybridization
b) Interspecific hybridization
c) Intergeneric hybridization
d) Intervarietal hybridization

234. Vegetables are chief source of:
a) Fats and minerals
b) Fats and vitamins
c) Minerals and vitamins
d) Proteins and vitamins

235. The entire collection having all the diverse alleles for all genes in a given crop is called
a) Gene collection
b) Germ collection
c) Germplasm collection
d) Plasma collection

236. The chances of catching bird flu from a properly cooked (above 100°C) chicken and eggs are
a) Very high
b) High
c) Moderate
d) Nil

237. Undifferentiated mass of plant cells grown on nutrient medium, is called
a) Callus
b) Bud
c) Clone
d) Scion

238. The totipotency of a cell refers to the
a) Flowering in a culture medium
b) Development of fruit from a flower in a culture medium
c) Development of an organ from a cell in culture medium
d) Development of all tissues of all kinds from a cell in a culture medium

239. A milk-like preparation can be made from the seeds of:
a) Gram
b) Soyabean
c) Grapes
d) Barley

240. Increase in food production is necessary because of:
a) The better land available
b) The population increase
c) The increased money power
d) The better irrigation facilities

241. Silk glands are modified:
a) Salivery glands
b) Anal glands
c) Colleterial glands
d) Mushroom glands

242. Consider the following statements
I. Solid stem in wheat exhibits non-preference by stem sawfly
II. In cotton, smooth leaf and absence of nectar repel bollworms
III. In maize, high aspartic acid, low nitrogen and sugar content protect them from stem borers
Which of the statements given above are correct?
a) I, II and III
b) I and II
c) I and III
d) II and III

243. Arhenotoky is a type of:
a) Parthenogenesis found in honey bees, wasps and ants
b) Parthenogenesis found in every insect

c) Parthenogenesis found in mosquitoes
d) Parthenogenesis found in butterflies

244. Zebu cattle is:
a) Water Buffalo b) Indian Buffalo c) Cow d) Sheep

245. Mule is produced from a cross between ...A... and ...B... Here A and B refers to
a) A-female horse; B-male donkey b) A-male horse; B-female donkey
c) A-male horse; B-female horse d) A-male donkey; B-female donkey

246. *Triticum aestivum*, the common breed of wheat is
a) Triploid with 21 chromosomes b) Tetraploid with 28 chromosomes
c) Hexaploid with 42 chromosomes d) Diploid with 14 chromosomes

247. In ..... male and female animals of two different related species are mated
a) Random breeding b) Artificial insemination
c) Controlled breeding d) Interspecific hybridisation

248. Central Silk Research and Training Institute (CSRTI) is located at:
a) Assam b) Bahrampur
c) Tarai region d) Shanthivials (Mysore)

249. Water Buffalo is:
a) European breed of buffalo that prefers living in water for most of the day
b) Buffalo like animal living in rivers
c) Llama
d) Buffalo

250. In lac insect, lac is produced from:
a) Abdominal glands b) Salivary glands
c) Skin glands of abdomen d) None of the above

251. Mode of nutrition of explant before organogenesis is
a) Photosynthetic b) Autotrophic c) Heteromorphic d) Heterotrophic

252. Most commercial silkworm strain is:
a) Uni-voltine b) Vi-voltine c) Multi-voltine d) All of these

253. Which among the following is the real product of honey bee?
a) Pollen b) Bee wax c) Honey d) Propolis

254. One of the alternate sources of protein for animal and human nutrition is
a) Single cell protein b) Proteomix c) Double cell protein d) All of these

255. The fibre crop occupying the largest area in India is as under:
a) Jute b) Flax c) Cotton d) Simbal

256. On the basis of unity, Nagapuri buffaloes are categorised as:
a) Grazers b) Dual purpose c) Draught cattle d) Milkers

257. The fruits of the plants which yield oil and fibres:
a) *Phoenix sylvestris* b) *Areca catechu* c) *Metroxylon safus* d) *Cocos nucifera*

258. In mutation breeding, mutation are induced by using radiation like
a) Gamma b) X-rays c) UV-rays d) All of these

259. The genetic ability of a plant to prevent pathogen from causing disease is called
a) Resistance b) Prevention c) Pathology d) None of these

260. The Indian carp is:
a) Scoliodon b) Labeo c) Torpedo d) Pristis

261. Poultry includes:
a) Fowl, duck, tortoise and turkey b) Fowl, duck, pigeon and tortoise
c) Duck, fowl, tortoise and turtle d) Fowl, duck, turkey and pigeon

262. Phytotron is
a) A controlled condition chamber b) A leaf culture process
c) A special culture of plants d) A root culture process

263. MOET stands for
a) Multiple Ovulation Embryo Transfer technology
b) More Ovulation Embryo Transfer technology
c) Multiple Ovulation Embryo Test technology
d) None of the above

264. *Nosemia sp.* a protozoan produces diseases in:
a) Silk moth
b) Honey bee
c) Both silk moth and honey bee
d) Lac insect

265. Colchicine brings about:
a) Gene mutations
b) Chromosome aberrations
c) Quick replication
d) Duplication of chromosomes

266. Central Sugarcane Breeding Research Institute is situated at:
a) Coimbatore
b) Lucknow
c) Delhi
d) Bhopal

267. Silk glands of silkworm are modified:
a) Crop glands
b) Salivary glands
c) Gastric glands
d) Intestinal glands

268. Consider the following statements
I. The honey bees are pollinators of many crop species such as sunflower, *Brassica*, apple and pear
II. Keeping beehives in crop fields during flowering period increases both crop yield and honey yield
III. A successful bee keeping requires management of beehives during different seasons
Which of the statements given above are correct?
a) I, II and III
b) I and II
c) II and III
d) I and III

269. Which of the following diseases in poultry is caused by nutritional deficiency?
a) Perosis
b) Fowl pox
c) Coryza
d) Aspergillosus

270. Hereditary variations can be got with the help of:
a) X-rays
b) DDT
c) Auxin
d) Gibberellin

271. Eri silk is produced by:
a) *Bombyx mori*
b) *Attacus ricini*
c) *Anthenea roylei*
d) *Anthenea paphia*

272. Consider the following statements
I. Semen is preserved for artificial insemination by heating
II. Most common bee species reared in India is *Apis indica*
III. Example of interspecific hybridization is mule
Which of the statements given above is/are not correct?
a) Only I
b) Only II
c) I and II
d) II and III

273. Genetic diversity of agricultural crops crops is threatened by:
a) Extensive intercropping
b) Intensive use of fertilizers
c) Introduction of high yielding varieties
d) Intensive use of biopesticides

274. In ..... high milk giving breeds of females and high quality meat giving bulls have been breed successfully to obtain a better breed in short time
a) MOET
b) Artificial insemination
c) Cross-bree ding
d) Induced mutation

275. The botanical name of popcorn is:
a) *Zea mays* var. everta
b) *Zea mays* var. tunicata
c) *Zea mays* var. indentata
d) *Zea mays* var. amylacea

276. Most common honey bee species in India
a) *Apis indica*
b) *Apis florea*
c) *Apis mellifera*
d) *Apis dorsata*

277. Pathogen free plants are obtained from:
a) Callus culture
b) Embryoid culture
c) Shoot apex culture
d) Root apex culture

278. When breeding is between different breeds, it is called
a) Inbreeding
b) Outbreeding
c) Outcrossing
d) Cross breeding

279. The new sugar cane varieties had the qualities like

I. high yield
II. thick stem
III. high sugar content
IV. ability to grow in North India
Choose the correct option
a) I, II and III b) II, III and IV c) I, II and IV d) I, II, III and IV

280. Single cell proteins provide food rich in
I. protein
II. minerals
III. fats
IV. carbohydrates and vitamins
Choose the correct option
a) I and III b) II, III and IV c) I, III and IV d) I, II, III and IV

281. Breeding crops for improved nutritional quality is referred to as
a) Biomagnification b) Biome c) Biofortification d) Biomining

282. Maize grain is deficient in:
a) Tryptophan and lysine b) Niacin and thiamine
c) Lysine and thiamine d) Tryptophan and thiamine

283. Crop plants grows in monoculture are:
a) Low in yield b) Characterised by poor root system
c) Free from intraspecific competition d) Highly prone to pests

284. Cassava is a:
a) Stem vegetable b) Root vegetable c) Leaf vegetable d) Flower vegetable

285. Earliest animal to be domesticated was:
a) Goat b) Dog c) Horse d) Cat

286. Rinderpest is the disease of:
a) Cattle b) Poultry c) Fish d) Camel

287. Composite fish farming is called:
a) Polyculture b) Pisciculture c) Monoculture d) None of these

288. Embryo culture is employed in:
a) Clonal propagation b) Induction of somaclonal variations
c) Overcoming hybridisation barriers d) Developing virus free plants

289. The yellow colour of cow milk is due to the presence of
a) Carotene b) Albumin c) Casein d) Lactose

290. Main composition of lac is:
a) Glue, pigment and sugar b) Wax, pigment and glue
c) Resin, pigment, wax and glue d) Resin, sugar and wax

291. Quite often pulse-crops are not manured with nitrogenous fertilizers. It is so because:
a) These do not require nitrogen b) These do not need nitrates or nitrites
c) These have nodulated roots d) These do not have nodulated roots

292. Fisheries includes rearing, catching, sellings, of
a) Fishes b) Molluscs c) Crustaceans d) All of these

293. The wax gland in honey bee is found in
a) Worker and queen b) Queen c) Drons d) Worker

294. Inbreeding is
a) Crossing between two unrelated species b) Crossing between two closely related individuals within the same breed
c) Crossing between different breeds d) None of the above

295. When the breeders wants to incorporate desired characters into the crop plants, they should
I. increase yield and improve

II. increased tolerance to salinity
III. resistance to pathogen viruses, fungi and bacteria
IV. increased tolerance to insect pests
Choose the correct option
a) I and II b) I, II and III c) II, III and IV d) All of these

296. Main protein type found in egg white is:
a) Ovalbumin b) Canalbumin c) Phosvitin d) Lipovitellin

297. The process of fusion of protoplast of somatic cells obtained from different varieties or species of plant on a suitable nutrient medium *in vitro* to develop a somatic hybrid is called
a) Somatic hybridization b) Cross hybridization
c) Intravarietal hybridization d) Interspecific hybridization

298. Pisciculture is rearing and production of
a) Fishes b) Birds c) Reptiles d) Cattles

299. Which factors are responsible for development of disease in a plant?
I. Susceptible plant
II. Aggressive pathogen
III. Excess amount of fertilizer
IV. Conductive environment
Choose the correct option
a) I, II and III b) I, II and IV c) II, III and IV d) I, III and IV

300. Which of the following is not a marine fish?
a) Hilsa b) Catla c) Pomfret d) Mackerel

301. The important parameters of poultry farm management are given below
I. selection of disease free, suitable breeds
II. proper and safe condition of farm
III. proper food and water
IV. temperature of poultry shed should be high for egg laying
Which of the statement given above is true and which is false?
I II III IV
a) T T T F b) F T T T c) T T F T d) T F T F

302. SCP production is based on industrial effluents so it helps to minimize
a) Environmental pollution b) Production of diseased crop
c) Nutrient medium for tissue culture d) All of the above

303. SCP reduces the pressure on agricultural production systems for the supply of the required
a) Vitamins b) Carbohydrate c) Minerals d) Proteins

304. The most used domesticated animal by Eskimos is:
a) Cow b) Sheep c) Goat d) Husky

305. Which of the following methods is/are used in recovery of healthy plants from diseased plants?
a) Embryo culture b) Meristem culture c) Suspension culture d) Anther culture

306. Poultry includes
a) Chicken b) Duck c) Turkey d) All of these

307. Scientists are trying to get hybridization between tomato and potato. The most accurate name of the recusant would be
a) Topato b) Topemo c) Potamo d) Pomato

308. Micropropagation is
a) Propagation of microbes *in vitro* b) Propagation of plants *in vitro*
c) Propagation of cells *in vitro* d) Growing plants on smaller scale

309. A collection of plants and seeds having diverse alleles of all the genes of a crop is called:
a) Herbarium b) Germplasm c) Gene library d) Genome

310. Hybrid breed of cattle is:

a) Sunandini b) Holstein c) Brown Swiss d) Kankrej

311. Select the false statement
a) Hybrid maize, jowar and bajra have been successfully developed in India
b) *Saccharum barberi* was originally grown in north India, but had poor sugar content and yield
c) Agriculture accounts for approximately 33% of India's GDP and employs nearly 62% of the population
d) None of the above

312. The term 'totipotency' refers to the capacity of a
a) Bud to generate whole plant b) Cell to generate whole plant
c) Seed to germinate whole plant d) Cell to enlarge in size

313. Which of the following is resistance to leaf and strip rust
a) Himgiri b) Pusa Komal c) Pusa Sadabahar d) Pusa Shubra

314. Removal of anther of some flowers during plant breeding is
a) Emasculation b) Anthesis
c) Pollination d) For collection of pollen

315. The animal close to human beings which is cloned by an American scientist *Dr. Don Wolf* 1996 is:
a) Gorilla b) Chimpanzee c) Gibbon d) Monkey

316. Majority of people suffer from protein, vitamins and micronutrient deficiencies. Their food does not contain essential micronutrients specially
I. iron
II. iodine
III. zinc
IV. vitamin-A
Which of the above are correct?
a) I, II and III b) I, III and IV c) II, III and IV d) I, II, III and IV

317. In plant biotechnology, PEG is used in
a) Protoplast isolation b) Cell culture preparation
c) Protoplast fusion d) Hardening

318. Aim of plant breeding is to:
a) Control pollution b) Keep soil fertile
c) Produce improved varieties d) To maintain wild plants

319. Choose the scientific name of a microorganism which produces high quality of protein
a) *Spirulina* b) *Chara* c) Agar-agar d) *Ephedra*

320. Disease resistant crop is obtained by
a) Crossing with new varieties b) Crossing with wild varieties
c) Injecting with organic compounds d) None of the above

321. More than 70% of livestock population is found in
a) Denmark b) India c) China d) Both (b) and (c)

322. Which of the following is the pair of biofertilizers?
a) Azolla and BGA b) Nostoc and legume
c) Rhizobium and grasses d) Salmonella and E.coli

323. Haploid plantlets can be produced by
a) Pollen culture b) Cotyledon culture c) Embryo culture d) Meristem culture

324. An exotic breed of cow is:
a) Ongole b) Friesian c) Halliker d) Deoni

325. Surrogate mother is:
a) Mother without lactation
b) Future mother with embryo implanted from another
c) Carrying several embryos at one time
d) Artificially inseminated female

326. Bactrian camel is characterised by:

a) Two humps and long neck
b) Two humps and long limbs
c) Two humps and thick coat
d) Single hump and thick coat

327. Inland fisheries is referred to:
a) Culturing fish in freshwater
b) Trapping and capturing fishes from sea coast
c) Deep sea fishing
d) Extraction of oil from fishes

328. Rearing of honey bees is practiced for obtaining
a) Honey
b) Wax
c) Honey and wax
d) None of these

329. Sugars extracted from sugarcane and sugar beet differ in:
a) Taste
b) Colour
c) C^{13}/C^{12} ratio
d) The one extracted from sugarcane is sucrose is while from sugarbeet is fructose

330. Some common marine fishes are
a) Hilsa
b) Mackerel
c) Pomfrets
d) All of these

331. Breeding of crops with higher levels of vitamins and minerals or higher protein and healthier fats is called
a) Plant breeding
b) Biofortification
c) Both (a) and (b)
d) Crop protection

332. Castor oil is obtained from:
a) *Brassica compestris*
b) *Ricinus communis*
c) *Helianthus annus*
d) *Arachis hypogea*

333. Cellular totipotency is demonstrated by
a) All eukaryotic cells
b) Only bacterial cells
c) Only gymnosperm cells
d) All plant cells

334. In honey, the percentage of maltose and other sugars is
a) 9.2
b) 8.81
c) 10.5
d) 11.2

335. Which of the following is a correct match between crop, variety and resistance to diseases?

Crops	Variety	Resistance to diseases
a) Wheat	Himgiri	White rust
b) Brassica	Pusa sadabahat	Black rot
c) Cowpea	Pusa komal	Bacterial blight
d) Chilli	Pusa swarnim	Chilly mosic virus

336. Which one is correct about Atlas 66?
a) It has high protein content
b) It has been used as a donor for improving cultivated wheat
c) both (a) and (b)
d) None of the above

337. Which one of the following mollusca groups is primarily used in the pearl formation?
a) Monoplacophorans
b) Cephalopods
c) Gastropods
d) Pelecypods

338. Semi-dwarf rice varieties were introduced in India
a) 1966
b) 1965
c) 1967
d) 1969

339. Cultivation of fishes in artificially prepared ponds
a) Aquaculture
b) Pisciculture
c) Vermiculture
d) Agriculture

340. Which of the following is the sequence of cultivation of fish?
a) Fry–fingerlings–spawn–Adult
b) Spawn–fry–fingerlings–adult
c) Adult–spawn–fingerlings–fry
d) Fingerlings–fry–spawn–adult

341. The composition of cotton fibre is:
a) Cellulose
b) Callose
c) Chitin
d) Pectin

342. *Triticum aestivum* is:
a) Diploid
b) Triploid
c) Haploid
d) Hexaploid

343. Main product of poultry is:
a) Eggs
b) Chicken
c) Meat
d) Eggs and meat

344. Elephants are sought after for:

a) Skin b) Hair c) Meat d) Ivory

345. Maximum contribution to the total milk production of our country comes from:
a) Cows b) Buffaloes c) Camels d) Goat

346. The practices concerned with the improvement in animals husbandry include
a) Management of farm and farm animals b) Animals breeding
c) Both (a) and (b) d) None of the above

347. Exotic breeds:
a) Require specific environment b) Hardy and high yielding
c) Are sturdy d) Take less food

348. Hatching net is called:
a) Nursery kind b) Production pond c) Stocking pond d) Hapa

349. Which of the following has been recently used for increasing productivity of super milk cows:
a) Artificial insemination by a pedigree bull only
b) Superovulation of a high production cow only
c) Embryo transplantation only
d) A combination of superovolation, artificial insemination and embryo transplantation into a carrier cow (surrogate mother)

350. Several South Indian states raise 2-3 crops of rice annually. The agronomic feature that makes this possible is
a) Shorter rice plant
b) Better irrigation facilities
c) Early yielding rice variety
d) Disease resistant rice variety

351. Crosses involving plants of the same variety are:
a) Intravarietal b) Interspecific c) Intervarietal d) Intrageneric

352. Animal breeding is producing improved breeds of ...A... by improving their ...B... through selective mating. Here A and B refers to
a) A-domesticated animals, B-phenotype
b) A-wild animals, B-genotype
c) A-domesticated animals, B-genotype
d) A-wild animals, B-phenotype

353. 250 g of *Methylophilus methylotrophus* bacterium has been used to produce
a) 15 tonnes of proteins b) 25 tonnes of proteins
c) 35 tonnes of proteins d) 50 tonnes of proteins

354. Aquaculture includes:
a) Freshwater fishing b) Brackish water fishes c) Marine fishery d) All of the above

355. The amount of protein per 100 g (without water, approximately 2 eggs) is:
a) 11.9 b) 20.1 c) 16 d) 45

356. Parthenogenesis is commonly found in:
a) Ants, bees and wasps b) Ascaris, earthworm and liver fluke
c) Frogs, fishes and foxes d) Star fish, Jelly fish and cuttle fish

357. Green revolution depended mainly on plant breeding techniques for high yielding and disease resistant varieties of
a) Wheat b) Rice c) Maize d) All of these

358. Crustacean fishery is connected with exploitation of
a) Oysters and crabs b) Mussels and squids c) Shell and cuttle fish d) Lobster and prawn

359. The art and science of combining ideas, facilities, process, materials and labour to produce and market a worth, while produce or service successfully called
a) Marketing b) Improvements c) Management d) None of these

360. The domesticated birds used for food or for their eggs are called

a) Poultry b) Egg farming c) Apiculture d) Dairy farming

361. In poultry birds, nasal and eye discharge with foul smell, acute respiratory problem and inflammed and swollen eyes are the symptoms of
a) Chronic respiratory disease b) Infectious coryza disease
c) Brooder pneumonia disease d) Marck's disease

362. Which type of silk is obtained from *Bombyx mori*?
a) Reeled silk b) Muga silk c) Arandi silk d) Tasar silk

363. A hybrid variety produced, having more meat producing capacity, in chickens is:
a) Broilers b) Plymoth rock c) White Cornish d) New Hemisphere

364. Somaclonal variations are obtained through:
a) Chemical mutagens b) Gamma rays c) Tissue culture d) Amphimixis

365. The principle source of sugar is/are:
a) Sugarcane b) Sugar beet c) Palm d) Both (A) and (B)

366. ...A... and ...B... cover more than 70% of the world's livestock population but contribute only 25% to the world farm production. Here A and B refers
a) A-India; B-China b) A-US; B-China c) A-India; B-US d) A-US; B-Brazil

367. Which of the following terms is used to describe the component isolated from a plant, for *in vitro* culturing in the specific medium?
a) Callus b) Embryoid c) Synthetic seeds d) Explant

368. The draught breeds of cattle include:
a) Malvi, Nageri and Hallikar b) Malvi, Nageri and Ongole
c) Nageri, Ongole and Haryana d) All the above

369. Cryopreservation is:
a) Preservation of living being in chemicals b) Preservation of very low temperature
c) Preservation through exposure to irradiation d) Preservation at high temperature

370. The name of the sheep which was cloned for the first time is:
a) Dolly b) Polly c) Molly d) Holly

371. A disease of poultry which reduces immunity and spreads through contaminated food is
a) Ranikhet disease b) Aflatoxicosis c) Thrush d) Marck's disease

372. For production of haploids, we culture
a) Shoot tip b) Anther c) Root tip d) None of these

373. Selection is a method of:
a) Cytology b) Plant physiology c) Plant breeding d) Genetics

374. Examples of high-yielding and disease resistant wheat varieties were introduced in India in
a) 1961 b) 1962 c) 1963 d) 1964

375. Lac is produced from:
a) Only males b) Only females
c) More females than males d) More males than females

376. Choose the flowers of which plant are not pollinated by honey bee
a) Sunflower b) Apple and pear c) *Brassica* d) All of these

377. Somaclones are obtained by
a) Tissue culture b) Plant breeding c) Irradiation d) Genetic engineering

378. The largest wheat producing country is:
a) India b) United States of America
c) Mexico d) Japan

379. Microbes like *Spirulina*, *Methylophilus methylotropus* can be grown on industrial scale as sources of good
a) Fat b) Carbohydrate c) Protein d) All of these

380. The world's highly prized wool yielding 'Pashmina breed' is:
a) Sheep b) Goat

c) Goat-sheep cross
d) Kashmir sheep-Afghan sheep cross

381. Shakti, Rattan and Protina are three important lysine rich varieties of
a) Rice b) Pulses c) Wheat d) Maize

382. An explant is
a) Dead plant
b) Part of the plant
c) Part of the plant used in tissue culture
d) Part of the plant that expresses a specific gene

383. High content of lysine is present in
a) Wheat b) Apple c) Maize d) Banana

384. The process of breeding by artificially inducing mutations using chemical or radiation is called
a) Artificial breeding b) Chemical breeding c) Synthetic breeding d) Mutation breeding

385. Infertility of local breeds of cattle can be overcome by use of:
a) Cross breeding with exotic breeds
b) Good nourishment
c) Stilbesterol
d) Gonadotropin

386. What will you conclude, when a cow is crossed to a bull and female progeny is yielding more milk than its mother?
a) More number of genes for high yielding milk are inherited, only from the female parent
b) More number of genes for high yielding milk are inherited only, from the male parent
c) More number of genes for high yielding milk are inherited only from both the parent
d) The progeny through mutation achieved more number of genes for high yielding milk

387. Semi-dwarf wheat was developed at
a) International Centre for Wheat and Maize Improvement Brazil
b) International Centre for Wheat and Maize Improvement Mexico
c) International Centre for Wheat and Rice Improvement Japan
d) International Centre for Wheat and Gram Improvement Mexico

388. Pisciculture has bright future in India due to:
a) Considerable demand
b) Good response of native fishes to culture
c) Abundance of cultivable waters
d) All of these

389. Resistance to yellow mosaic virus in bhindi was transferred from a wild species and resulted in new variety of *A. esculentus* called
a) Golden kranti b) Sonalika c) IR-8 d) Parbhani

390. 'Himgiri' developed by hybridisation and selection for disease resistance against rust pathogens is a variety of:
a) Chilli b) Maize c) Sugarcane d) Wheat

391. Pearl producing Indian species is:
a) *Pinctada indica* b) *Ostrea indica* c) *Pinctada vulgaris* d) *Ostrea vulgaris*

392. Which one of the following is a viral disease of the poultry?
a) Coryza b) New castle disease c) Pasteurellosis d) Salmonellosis

393. At the time of herd improvement by MOET generally ...A... ovum is released from each ...B... at the time of ...C... . But by ...D... injection ...E... ova can be produced from the ovary. After artificial insemination ...F... embryo are collected at a time. Then each embryo is transplanted into a ...G... A to G in the above paragraph refers
a) A-one, B-testis, C-spermatogenesis, D-hormone, E-more, F-one, G-mother
b) A-one, B-ovary, C-ovulation, D-hormone, E-more, F-4 to 10, G-surrogate mother
c) A-one, B-ovary, C-ovulation, D-enzyme, E-more, F-4 to 10, G-mother
d) A-one, B-ovary, C-ovulation, D-chemical, E-more, F-one, G-mother

394. MOET is method of:
a) Fish cultivation
b) Cloning in sheep
c) Hybridization in cattle
d) Birth control in humans

395. SCP is rich in high quality ...A... and is poor in ...B... . Here A and B refers to
a) A-protein; B-minerals b) A-protein; B-fats c) A-fats; B-protein d) A-lipid; B-protein
396. The term Plantain refers to:
a) Unripe banana b) Fully ripe banana c) Banana pudding d) None of the above
397. The Indian tiger prawn is:
a) *Penaeus indicus* b) *Penaeus monodon* c) *Macrobrachium* d) *Palaemon*
398. Lac is produced as:
a) Faeces of lac body b) Secretion from body
c) Excretion from body d) Excess from oozing out of body
399. Which of the following is incorrect w. r. t SCP?
a) Quantitative and qualitatively superior proteins
b) Production involves utilization of organisms which has high rate of biomass production and growth
c) 250 g *Methylophilus methylotrophus* can produce 20 tonnes of protein per day
d) Can be obtained from both unicellular and multicellular organisms
400. *Pennisetum* and *Sorghum* are of African origin, while rice originated in:
a) China b) India c) America d) Africa
401. Examples of crustaceans are
a) Prawns b) Crabs c) Both (a) and (b) d) None of these
402. *Saccharum barberi* and *Saccharum officinarum* are varieties of
a) Sugar cane b) Maize c) Wheat d) Rice
403. Classical plant breeding involves
I. crossing hybridization of purelines
II. artificial selection to produce plants with desirable characters of high yield
III. nutrition
IV. resistance to disease
Choose the correct option
a) I, II and III b) I, III, and IV c) II, III and IV d) I, II, III and IV
404. Sugar is extracted besides sugarcane from:
a) Potato b) Sweet-potato c) Beet d) Colocasia
405. The drug which reduces blood pressure is obtained from:
a) *Solanum nigrum* b) Aconitum
c) *Centella asiatica* d) *Rauwolfia serpentina*
406. Huskies are:
a) Yaks b) Donkeys c) Thick coated dogs d) Water buffaloes
407. In mung bean, resistance to yellow mosaic virus and powdery mildew were introduced by
a) Hybrid vigour b) Plant breeding c) Hetrosis d) Mutation
408. Shagreen is obtained from:
a) Dried skin of shark b) Skin of codfish c) Air bladder of fishes d) None of the above
409. Which of the following is correctly matched?
a) Apiculture – Honey bee b) Pisciculture – Silk moth
c) Sericulture – Fish d) Aquaculture – Mosquitose
410. Milk yield is primarily dependent on the
a) Quality of breeds b) Quality of milk c) Both (a) and (b) d) None of these
411. Before the European invader which vegetable was absent in India?
a) Potato and Tomato b) Simla mirch and Brinjal
c) Maize and chichinda d) Bitter gourd
412. Which one of the following types of silk is being produced extensively in South India?
a) Eri b) Mulberry c) Tussar d) Muga
413. Which is the most important source of food and fodder?
a) Algae b) Fungi c) Cereals d) Gymnosperms

414. The scientific name of Bajra is:
a) *Sorghum vulgare* b) *Corchorus capsularis*
c) *Gossypium herbaceum* d) *Pennisetum typhoides*

415. Macaroni is obtained from:
a) *Oryza sativa* b) *Sorghum vulgare*
c) *Triticum durum* d) *Ricinus communis*

416. The management of animals for milk and its products for human consumption is called
a) Dairying b) Poultry
c) Cattle farming d) Livestock improvement

417. To isolate protoplast, one needs
a) Pectinase b) Cellulase c) Both (a) and (b) d) Chitinase

418. The green alga rich in protein used as food supplements even by space travellers is
a) *Chlamydomonas* b) *Volvox* c) *Spirogyra* d) *Spirulina*

419. Consider the following statements which of them are the advantages of tissue culture/micropropagation
I. a large number of plants can be grown in short time
II. disease free plants can be developed from diseased plants
III. seedless plants can be multiplied
IV. somatic hybrids can be raised by tissue culture, where sexual hybridization not possible
Choose the correct option
a) I, II and III b) II, III and IV c) I, II and IV d) I, II, III and IV

420. Which of the following countries has minimum average annual milk yield per cow?
a) India b) Pakistan c) Netherlands d) England

421. Which of the following pair belongs to crustacean fishery?
a) Oysters and crabs b) Mussels and squids c) Shells and culttle fish d) Lobster and prawn

422. Consider the following statements
I. The progeny of cross-breeding may be used for commercial production
II. In case of artificial insemination, the semen can be used immediately or can be frozen for later use
III. Controlled breeding experiments are carried out using artificial insemination and multiple ovulation embryo transfer technology
Which of the statements given above are correct?
a) I and II b) I and III c) II and III d) I, II and III

423. Pulses belong to the family:
a) Leguminosae b) Gramineae c) Cruciferae d) Compositae

424. The green revolution in India was possible due to:
a) Exploitation of high yielding varieties
b) Intensive cultivation
c) Better irrigation, fertilizer, pesticides etc. facilities
d) All the above

425. The fishery does not include the rearing, catching and processing of
a) Crabs and corals b) Squids and lobsters
c) Aquatic plants and animals d) All of the above

426. Bird flu is caused by
a) Fungus b) Bacteria c) Protozoa d) Virus

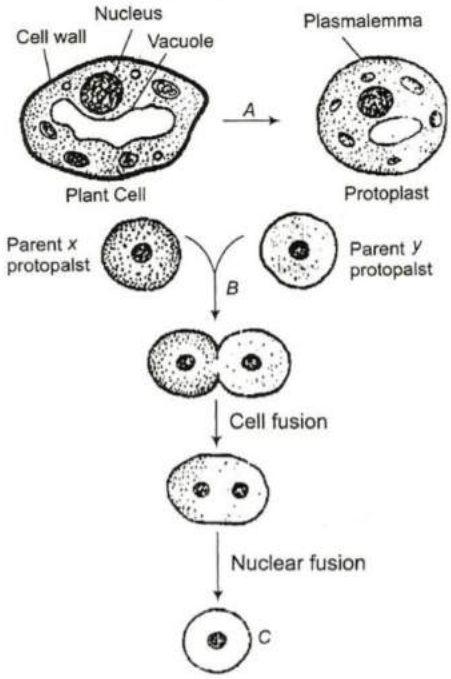
427. The host crop plants may be resistant to insects pests due to the
I. morphological characteristics
II. biochemical characteristics
III. physiological characteristics
Choose the correct option
a) I and II b) II and III c) I and III d) I, II and III

428. Rice, maize, sorghum and millets are the principal cereals of the:

a) Temperate region b) Tropics c) North pole d) Cold regions

429. When breeding is between the unrelated animals, including individuals of the same breed but having no common ancestors for 4-6 generations or between different breeds or different species, it is called
a) Outbreeding b) Inbreeding
c) inbreeding depression d) Hybridization

430. The following diagram refers to protoplast fusion



Here A, B and C refers to
a) A-Cellulase and bactinase, B-Polyethylene glycol, C-Somatic hybrid cell
b) A-Pectinase, B-Cellulase, C-Zygotic cell
c) A-Proteinase, B-Polyethylene glycol, C-Somatic hybrid cell
d) A-Cellulase, pectinase, B-Proteinase, C-Germ cell

431. Which of the following crop plants is not matching as correct pair with its variety
I. Chili – Pusa Sadabahar
II. Flat bean – Pusa stem-2
III. Rape seed – Pusa Gaurav
IV. Cauliflower – Pusa Shubhra
V. Cow pea – Pusa Komal
VI. Wheat – Pusa A-4
Choose the correct option
a) V b) VI c) IV d) I

432. Part of the plant, which is cultured to obtain virus free clones is
a) Leaf b) Root tip c) Short tip d) Embryo

433. Which one of the following is a viral disease of poultry?
a) Bird flu b) Swine flu c) Fowl cholera d) Spirochaetosis

434. Given below are a few statements regarding somatic hybridisation
I. Protoplasts of different cells of the same plant can be fused
II. Protoplasts from cells of different species can be fused
III. Treatment of cells with cellulose and pectinase is mandatory
IV. The hybrid protoplast contains characters of only one parental protoplast
Choose the correct option
a) I and II b) I and I c) II and III d) III and IV

435. Semi-dwarf wheat was developed by
a) Norman E Borlaug b) MS Swaminathan c) WY Cheung d) Fontana
436. Single cell protein reduces
a) Environment pollution b) Greenhouse effect
c) Global warming d) Production and growth of crop
437. The process which results in the identification of superior males and superior females of the same breed
a) Inbreeding b) Outbreeding c) Outcrossing d) None of these
438. The species which yield commercial cotton belongs to the genus:
a) *Hibiscus* b) *Abutilon* c) *Sida* d) *Gossypium*
439. ...A... and ...B... were crossed to obtained sugarcane varieties having desirable qualities and ability to grant in the sugarcane areas of North India. The most appropriate option for A and B is
a) A-*Saccharum procerum*; B-*Saccharum robustum*
b) A-*Saccharum barberi;* B-*Saccharum robustum*
c) A-*Saccharum spontanum;* B-*Saccharum* barberi
d) A-*Saccharum barberi;* B-*Saccharum officinarum*
440. Some common fresh water fishes are
a) Catla b) Rohu c) Common carp d) All of these
441. Taichung native-the dwarf rice variety in India is a native of:
a) Japan b) Philippines c) Taiwan d) Mexico
442. Silk, honey and lac are:
a) Secretory substances of insects b) Secretory substances of plants
c) Artificial chemicals d) All of the above
443. Which of the following is insect pest resistance?
a) Pusa Gaurav b) Pusa Sem-2 c) Pusa Sem-3 d) All the above
444. Molluscs are also called as
a) Ray fish b) Golden fish c) Electric fish d) Shell fish
445. To meet the demands of the society, *in vitro* production of a large number of plantlets in a short duration is practiced in floriculture and horticulture industry today. It is called
a) Somatic hybridization b) Micropropagation
c) Hybridoma technology d) Somaclonal variation
446. Rearing of honey bees for obtaining honey and bee wax is called
a) Pisciculture b) Sericulture c) Apiculture d) Aquaculture
447. The word poultry is used for
a) Wild birds b) Domestic bird c) Both (a) and (b) d) All of these
448. Who gave the idea that every plant cell is totipotent?
a) PR White b) EC Cocking c) FC Steward d) G Haberlandt
449. Lac is a:
a) Plant product b) Mineral product c) Synthetic product d) Animal product
450. Edible aquatic animals are
a) Crab b) Lobster c) Oyster d) All of these
451. Which of the following is not a root vegetable?
a) *Solanum tuberosum* b) *Ipomoea batatas*
c) *Beta vulgaris* d) *Raphanus sativus*
452. Ranikhet or New Castle Disease of poultry is caused by:
a) Bacteria b) Virus c) Fungus d) None of these
453. In dairy management, the people deals with processes and systems that
a) Increase yield of milk b) Improve quality of milk
c) Both (a) and (b) d) Marketing of milk
454. Ship of desert is:
a) Elephant b) Camel c) Sheep d) Goat

455. Exotic breeds are:
a) Used for cross breeding
b) Allowed to multiply and replace local breeds
c) Easy to manage
d) Resistant to local pests and pathogens

456. When breeding is between animals of the same breed for 4-6 generation, it is called
a) Crossbreeding
b) Outbreeding
c) Outcrossing
d) Inbreeding

457. Paddy is suitable for cultivation in:
a) Red soils
b) Dry soils
c) Irrigated soils
d) Black soils

458. Father of white revolution in India is
a) Verghese Kurein
b) Dr MS Swaminathan
c) Alexzander Flemming
d) William Harvey

459. Dharwar American variety of cotton is the product of
a) Mass selection
b) Mutual breeding
c) Clonal selection
d) Parasexual hybridization

460. The scientific name of Jowar is:
a) *Sorghum vulgare*
b) *Corchorus capsularis*
c) *Gossypium herbaceum*
d) *Pennisetum typhoides*

461. The commercial jute fibers are:
a) Xylem fibres
b) Cortical fibres
c) Phloem fibres
d) Interxylary fibres

462. Haploid plants are preferred over diploid plants for study of mutation because in haploids:
a) Culturing is easy
b) Only dominant mutation expresses
c) Only recessive mutation expresses
d) All mutations express

463. Which of the statements is correct?
I. The maintenance of hives for the production of honey bees for the is called apiculture
II. A group of animals related by descent and similar in most characters are called a breed
III. The agriculture practice of breeding and raising livestock is called animal husbandry
Choose the correct option
a) I, II and III
b) I and II
c) I and III
d) II and III

STRATEGIES FOR ENHANCEMENT IN FOOD PRODUCTION

: ANSWER KEY :

1)	a	2)	b	3)	d	4)	d	157)	c	158)	b	159)	c	160)	a
5)	c	6)	c	7)	a	8)	c	161)	a	162)	a	163)	b	164)	a
9)	d	10)	a	11)	c	12)	b	165)	a	166)	d	167)	c	168)	b
13)	c	14)	c	15)	d	16)	c	169)	d	170)	c	171)	d	172)	a
17)	c	18)	d	19)	c	20)	a	173)	b	174)	a	175)	c	176)	b
21)	a	22)	d	23)	c	24)	b	177)	d	178)	c	179)	c	180)	a
25)	a	26)	d	27)	d	28)	a	181)	a	182)	a	183)	b	184)	a
29)	c	30)	c	31)	c	32)	b	185)	b	186)	d	187)	a	188)	d
33)	a	34)	d	35)	a	36)	b	189)	c	190)	a	191)	d	192)	c
37)	b	38)	c	39)	a	40)	d	193)	b	194)	b	195)	d	196)	a
41)	b	42)	a	43)	d	44)	c	197)	d	198)	a	199)	a	200)	d
45)	a	46)	d	47)	d	48)	b	201)	a	202)	b	203)	a	204)	c
49)	a	50)	b	51)	d	52)	d	205)	d	206)	c	207)	c	208)	a
53)	b	54)	a	55)	a	56)	a	209)	d	210)	a	211)	b	212)	a
57)	a	58)	b	59)	a	60)	b	213)	a	214)	d	215)	c	216)	a
61)	b	62)	a	63)	a	64)	c	217)	a	218)	b	219)	a	220)	b
65)	c	66)	a	67)	c	68)	d	221)	b	222)	c	223)	c	224)	b
69)	a	70)	d	71)	b	72)	c	225)	c	226)	a	227)	c	228)	a
73)	c	74)	c	75)	a	76)	c	229)	b	230)	a	231)	a	232)	c
77)	d	78)	c	79)	a	80)	d	233)	b	234)	c	235)	c	236)	d
81)	a	82)	c	83)	b	84)	c	237)	a	238)	c	239)	b	240)	b
85)	b	86)	c	87)	c	88)	c	241)	a	242)	a	243)	a	244)	c
89)	d	90)	b	91)	d	92)	a	245)	a	246)	c	247)	d	248)	d
93)	b	94)	c	95)	d	96)	c	249)	d	250)	c	251)	d	252)	b
97)	a	98)	d	99)	b	100)	d	253)	d	254)	a	255)	c	256)	d
101)	b	102)	c	103)	a	104)	a	257)	d	258)	d	259)	a	260)	b
105)	b	106)	b	107)	c	108)	a	261)	d	262)	a	263)	a	264)	c
109)	b	110)	b	111)	c	112)	d	265)	d	266)	a	267)	b	268)	a
113)	d	114)	a	115)	b	116)	c	269)	a	270)	a	271)	b	272)	d
117)	d	118)	b	119)	d	120)	b	273)	c	274)	a	275)	a	276)	a
121)	a	122)	d	123)	c	124)	c	277)	c	278)	b	279)	d	280)	d
125)	c	126)	a	127)	c	128)	a	281)	c	282)	a	283)	d	284)	b
129)	a	130)	d	131)	b	132)	a	285)	b	286)	a	287)	a	288)	c
133)	b	134)	c	135)	a	136)	d	289)	a	290)	c	291)	c	292)	d
137)	d	138)	d	139)	b	140)	d	293)	d	294)	d	295)	d	296)	a
141)	b	142)	d	143)	d	144)	b	297)	a	298)	a	299)	b	300)	b
145)	c	146)	b	147)	a	148)	c	301)	a	302)	a	303)	d	304)	d
149)	b	150)	b	151)	a	152)	d	305)	b	306)	d	307)	d	308)	b
153)	c	154)	a	155)	d	156)	b	309)	b	310)	a	311)	d	312)	b

313)	a	314)	a	315)	d	316)	d	393)	b	394)	c	395)	b	396)	a
317)	c	318)	c	319)	a	320)	b	397)	b	398)	b	399)	c	400)	b
321)	d	322)	a	323)	a	324)	b	401)	c	402)	a	403)	d	404)	b
325)	b	326)	c	327)	a	328)	c	405)	d	406)	c	407)	d	408)	a
329)	c	330)	d	331)	b	332)	b	409)	a	410)	a	411)	a	412)	c
333)	d	334)	b	335)	c	336)	c	413)	c	414)	d	415)	c	416)	a
337)	d	338)	a	339)	b	340)	c	417)	c	418)	d	419)	d	420)	a
341)	a	342)	d	343)	a	344)	d	421)	d	422)	d	423)	a	424)	c
345)	b	346)	c	347)	a	348)	d	425)	c	426)	d	427)	d	428)	b
349)	d	350)	c	351)	a	352)	c	429)	a	430)	a	431)	b	432)	c
353)	b	354)	d	355)	b	356)	a	433)	a	434)	c	435)	a	436)	a
357)	d	358)	d	359)	c	360)	a	437)	a	438)	d	439)	d	440)	d
361)	b	362)	a	363)	a	364)	c	441)	a	442)	a	443)	d	444)	d
365)	d	366)	a	367)	d	368)	a	445)	b	446)	c	447)	a	448)	d
369)	b	370)	c	371)	b	372)	b	449)	d	450)	d	451)	a	452)	b
373)	c	374)	c	375)	b	376)	d	453)	c	454)	b	455)	a	456)	d
377)	a	378)	b	379)	c	380)	b	457)	c	458)	b	459)	d	460)	a
381)	d	382)	c	383)	c	384)	d	461)	c	462)	d	463)	a		
385)	d	386)	c	387)	b	388)	d								
389)	d	390)	d	391)	c	392)	b								

STRATEGIES FOR ENHANCEMENT IN FOOD PRODUCTION

: HINTS AND SOLUTIONS :

1 **(a)**
Aquaculture is the farming of aquatic organisms such as fish, crustaceans, mollusc and aquatic plants

2 **(b)**
Differentiation of organs and tissues in a developing organism is associated with the differential expression of the genes. In regulation of gene expression, the chromosomal proteins plays an important role. The chromosomal proteins plays an important role. The chromosomal proteins are of two types-histones and non-histones. The regulation of the gene expression involves an interaction between histones and non-histones

5 **(c)**
Mating between male and female animals of two different species is called interspecific hybridization. The Mule is the best example of a successful cross between two different species, the female horse and the male donkey

7 **(a)**
Bee wax is a product of industrial importance. It is used in the manufacture of cosmetics, shaving creams and polishes

8 **(c)**
In 1963 the increase in crop production was due to introduction of semi-dwarf varieties of wheat. Semi-dwarf wheat was developed by Norman E. Borlaug at International Centre for Wheat and Maize Improvement in Mexico. Semi-dwarf varieties of rice were developed from IR-8 (developed at International Research Institute Phillipines) and Taichung Native-1 (developed in Taiwan)

10 **(a)**
Evalution. of germplasm is carried out to identify plants with desirable combination of characters

14 **(c)**
S. barberi was grown in North India, had poor sugar content and yield
S. officinarum did not grown in North India, had thicker stem and higher sugar content

15 **(d)**
Three billion people suffer form protein, vitamins, and micronutrient deficiencies or hidden hunger because these people can not afford to buy enough vegetable, fruits, legumes, fish and meat. Their food does not contain essential micronutrients specially iron, iodine, zinc and vitamin-A. Breeding of crops with higher levels of vitamins, minerals or higher protein and healthier fats is called biofortification. This is the most practical aspect to improve the health of the people

20 **(a)**
In protoplasm fusion the enzyme required are cellulose, hemicellulose and pectinase

22 **(d)**
All statements are correct

23 **(c)**
In callus culture, cell division in explant forms a callus. Callus is irregular unorganized and undifferentiated mass of actively dividing cells. Darkness and solid medium gelled by agar stimulates callus formation. The culture medium contains growth regulators auxin 2, 4-D and often a cytokinin like BAP. Both of these growth regulators stimulate meristematic property in callus

28 **(a)**
The plant cell without the cell wall is called protoplast. Naked protoplasts surrounded only by plasma membranes

29 **(c)**
Cellular totipotency, is the ability of a cell to give rise to a complete plant, when cultured in a

suitable culture medium at appropriate temperature and aeration condition

30 **(c)**
Continued inbreeding usually reduces fertility of animals and even their productivity. This condition is called inbreeding depression. Such kind of inbreeding depression in selected animals of the breeding population can be over come by mating them with unrelated superior animals of the same breed. Such type of mating usually helps to restore fertility and yield

31 **(c)**
Mating between unrelated members of the same breed is called out crossing. However, the mating partners should not have common ancestors on either side of their pedigree up to 4-6 generation. Out crossing is usually preferred in animals having poor productivity of milk, poor growth rate and suffering from inbreeding depression

32 **(b)**
Mutation is a phenomenon by which genetic variation is achieved through changes in the base sequences with in genes, which creates a new character or trait absent in parental generation. Mutation which occur naturally are called spontaneous mutations and those which are induced artificially are called induced mutations. The application of induced mutation for crop improvement is called mutation breeding

33 **(a)**
Breeding is carried out by the conventional breeding techniques or by mutation breeding. The conventional method of breeding for disease resistance is that of hybridization and selection. Mutation breeding is defined as the process of breeding by artificially inducing mutations using chemicals (like aniline) or radiations like (gamma radiation). This radiation breeding is nothing but the step of Mutation breeding

34 **(d)**
Livestock are domesticated animals raised in an agricultural setting to produce commodities such as food, fibre and labour, *e*. *g*., sheep, pigs, camels, cattle and buffaloes, etc.

36 **(b)**
Breeding involves crosses between useful animal breeds aiming to increase the yield of animals and to improve the desirable qualities of the produce

38 **(c)**
Isinglass is produced from the air bladder of cat fishes and carps. Isinglass is principally used for clarifying wines, beer and making purse, honey, comb, book and ribbon. The isinglass prepared in Russia is of the best quality in the world

39 **(a)**
The enzyme used for isolation of single cell from explant cell is pectinase. The cell walls of cell are digested by enzymes like pectinase and cellulase to expose the naked protoplasts

40 **(d)**
Dairying is the management of animals, which provide milk and its products for human consumption

42 **(a)**
One of the examples of cross breeding is the production of a new breed of sheep, called Hisardale. This breed was developed in Punjab by crossing Bikaneri ewes and marino rams

43 **(d)**
Economic importance of fish includes
Fish as Food The fish flesh is an excellent source of protein has very little fat, carries a good amount of minerals and vitamins-A and D and rich in iodine
Source of Income Millions of fisherman and farmers, particularly in coasted states, are engaged in this business which has an important place in Indian economy
Aesthelic Value A large number of fish are cultured in aquarium for their beauty and graceful movements

44 **(c)**
Lysine and tryptophan are essential amino acid. Our body can not synthesis atleast 8 amino acid (10 in children) which must be provided in the diet from outside. These eight amino acids are called essential amino acids. Thus, these essential amino acids, when present in the protein of our diet in sufficient amount, constitute protein quality

45 **(a)**
In mung bean resistance to yellow mosaic virus and powdery mildew were introduced by mutations

46 **(d)**
Conventional breeding method is carried out by the following steps
(i) Selection and screening of germplasm for disease resistance

(ii) Hybridisation of selected plants
(iii) Testing and release of new varieties into the market
Mutation breeding is carried out by the following steps

1. Inducing mutations in plants
2. Screening the plant for resistance
3. Selecting the desirable plant for multiplication for breeding

47 **(d)**
Breeding involves crosses between useful animal breeds, aiming to increase the yield of animals and to improve the desirable qualities of the produce

49 **(a)**
The outcome of increased resistance power in crops enhances food production. This also help to reduce the dependency on use of fungicides and bacteriocides

51 **(d)**
Science of altering the genetic pattern of plants in order to increase their value and utility for human welfare is called plant breeding. Aim of plant breeding are to grow disease free, high yielding and early maturing varieties

53 **(b)**
Improved varieties of wheat suitable for Indian environment have been developed by hybridization and mutation

54 **(a)**
Bee wax.
Bee wax is a product of industrial importance. It is used in the manufacture of cosmetics, shaving creams and polishes

56 **(a)**
Fishery is a kind of industry, which is concerned with the catching, processing or selling of fish, shell fish (prawns and molluscs) or other aquatic animals such as crabs, lobster, edible oyester, etc.

57 **(a)**
The embryo which develops from somatic cell is called somatic embryo

59 **(a)**
Plant breeding is the purposeful manipulation of plant species in order to create plant types that are better suited for cultivation give better yields and are disease resistant

60 **(b)**
Rhode Island Red is a breed of domestic fowl, originated in America, characterized by a dark raddish-brown plumage and the production of brown eggs

63 **(a)**
Aseel is an indigenous breed. Aseel is one of the best table bird but it cannot be raised for commercial purposes because of its poor growth and low fertility. The original aseel is a medium sized aggressive bird commonly known as the Reza or the Tikra. Pure specimens of this breed are now rare and are available with some fanciers in the parts of AP, Karnataka and UP

64 **(c)**
The bee wax obtained from the hives of honey bees is used in many industries for the preparation of cosmetics and polishes

65 **(c)**
Both (a) and (b).
In 1963 the increase in crop production was due to introduction of semi-dwarf varieties of wheat. Semi-dwarf wheat was developed by Norman E. Borlaug at International Centre for Wheat and Maize Improvement in Mexico. Semi-dwarf varieties of rice were developed from IR-8 (developed at International Research Institute Phillipines) and Taichung Native-1 (developed in Taiwan)

75 **(a)**
In tissue culture, shoot regeneration is promoted by cytokinin, and root generation is promoted by auxin like NAA (Naphthalene Acetic Acid). An excess of auxin promotes root regeneration, whereas that of cytokinin promotes shoot regeneration. Roots regenerates from the lower end of these shoots to give complete plantlets

76 **(c)**
During the last two decades due to impact of blue revolution there has been a rapid global expansion of commercial aquaculture and it is now contribute significantly to the total global sea food production

78 **(c)**
Keeping beehives in crop fields during flowering period increases pollination efficiency and improves the yield, which is beneficial to both from the point of view of crop yield and honey yield

80 **(d)**

More than 840 million people in the world do not have adequate food to meet their daily requirements. Three billion people suffer from protein, vitamins and micronutrient deficiencies or hidden hunger because these people can not afford to buy adequate vegetable, fruits, legumes, fish and meat

82 **(c)**
International rice Research Institute is situated of Manila (Philippines) and Indian Rice Research Institute situated at Cuttack

83 **(b)**
Pomato is somatic hybrid between potato and tomato and Bomato is somatic hybrid between brinjal and tomato. Somatic hybrid are also produced between rice and carrot

84 **(c)**
Apiculture or bee culture is the rearing of honey bees by culturists in different parts of the world to obtain honey and bees wax on commercial scale. Both the products are used in medicines, cosmetics and various other industries. Now-a-day bee venom is also collected on commercial scale for the treatment of snake bite, arthritis and many other diseases

85 **(b)**
Somatic hybridization or parasexual hybridisation involves the fusion of isolated protoplasts of two different species

91 **(d)**
Animal husbandry is the agricultural practice of feeding, breeding and raising animal livestock whose primary purpose is to provide meat and milk. Meat animals include beef, cattle, sheep and meat goats. Milk animals include cows and buffaloes.
Poultry is a class of domesticated fowl used for food and for their eggs. Fisheries is also an important source of animal food, which is concerned with rearing, catching and selling of fish, molluscs (shell fish) and crustaceans prawns, crabs, etc.

92 **(a)**
The agents which are used to induce mutation are called mutagens. Some common mutagens are radiation UV-rays, gamma rays, etc. Chemical – aniline, nitrous acid, mustard gas, etc.

94 **(c)**
In our country, poultry mainly means chickens domesticated for eggs and meat Cow milk is slightly yellow in colour due to presence of carotene, which is precursor for yellow colour in cow milk is in the form of vitamin-A

97 **(a)**
The most common egg-type variety used for commercial production through out the world is leghorn

98 **(d)**
8-32 celled embryo.
MOET is program for herd improvement in animal like cattle sheep, rabbits, buffaloes, mare, etc.
A cow is administered hormones with FSH-like activity to induce follicular maturation and supper ovulation
The cow produces 6-8 eggs instead of one egg produced normally
It is now, either mated with an elite bull or artificial insemination is carried out
When the fertilized eggs attain 8-32 cells stage, they are non-surgically removed and transferred to a surrogate mother
The genetic mother can now be again super-ovulated

101 **(b)**
Explant.
Plant tissue culture is a technique of growing cells, tissues or organs in sterilized nutrient media under controlled aseptic condition. The plant materials to be cultured may be cells, tissues or plant organs. The plant part which is used to culture is called explant

102 **(c)**
The vegetable sources of vitamins-A are fat and cholesterol free. Sources of vitamin-A are carrots, pumpkin, sweet potatoes, winter squashes, cantaloupe, pink grape fruit, apricots, broccoli, spinach, and most dark green, leafy vegetables

103 **(a)**
A group of animals, which are related by descent and share many similarities and referred to as breed

104 **(a)**
A successful breeding programme.
Germplasm is the sum to total of all the alleles of the genes present in a crop and its related species. The entire collection of plants/seeds having all the diverse alleles for all genes in a given crop is called germplasm collection. A good germplasm collection is essential for a successful breeding program

107 **(c)**
Healthy plants can be recovered from diseased plants by this method. Apical and axillary meristem is the only virus free part of a virus-infected plant. By removing the meristem and growing it *in vitro*, virus-free plants can be obtained

108 **(a)**
Sugar cane is an important cash crop. Sugarcane cultivator requires thick stem, long internodes, high sugar content and disease resistant crop

109 **(b)**
Hardening is the acclimatization of plants formed by tissue culture before growing in the field to make them strong to adapt in new environment

113 **(d)**
Mutation breeding is carried out by the following steps
Inducing mutations in plant by various means
Screening the plant for resistance
Selecting the desirable plant for multiplication and breeding

114 **(a)**
A-North, B-Poor, C-North, D-Higher

117 **(d)**
Solid stems in wheat lead to non-preference by the stem sawfly. Insect resistance in host crop plants is due to morphological, biochemical or physiological characters

121 **(a)**
A-11 million, B-75 million, C-35 million, D-89.5 million

122 **(d)**
Emasculation is the removal of anthers before maturity. It is useful for cross pollination and hybridization

126 **(a)**
Genetic variability is the root any breeding program pre-existing genetic variability is collected from wild varieties, species and relatives of the cultivated crop species

127 **(c)**
In 1963, ICAR introduced dwarf selections from CIMMYT, including those developed by Norman Borlaug using Norin-10 as the source of dwarfing genes

129 **(a)**
Cellular totipotency is a ability of cell to give rise to a complete plant, when cultured in a suitable culture medium at appropriate temperature and aeration condition

130 **(d)**
All of these.
Easy to Grow Microbes can be grown on materials like waste water from potato processing plants, straw, molasses, animal manure and sewage
(i) **Nutrient Rich** Provide food rich in protein, minerals, fats, carbohydrates and vitamin
(ii) **High Yield** Due to high rate of biomass production and growth, large amounts are produced

133 **(b)**
Pisciculture.
Pisciculture is the breeding, hat ching and rearing of fish under controlled condition

135 **(a)**
Wonder wheat is a new wheat variety with a yield of 18 tonnes per hectare. It has some 200 grains per stalk and has developed by Mexico's international Wheat and Maize Improvement Centre

136 **(d)**
Somatic hybridization is a process of obtaining hybrids by fusion of protoplast *in vitro*

137 **(d)**
Some plants developed by meristem culture are banana, sugarcane and potato, etc. Healthy plants can be recovered from diseased plants by meristem culture

138 **(d)**
Culturing of isolated plant organ is called organ culture

139 **(b)**
Allopolyploid means a mixture of two different genetic forms. *Triticale* is first man made allopolyploid cereal crop

140 **(d)**
Honey is a sweet edible fluid of high nutritive value. It contains sugar, water, minerals, vitamins, amino acids, enzymes and pollen. It has a great importance for its medicinal value

141 **(b)**
Cereals and millets are mainly deficient in tryptophan amino acid. Tryptophan, an essential amino acids, is the largest of the amino acids. It is also a derivative of alanine, having an indole substituent on the β-carbon

142 **(d)**

Ranikhet disease is a common viral disease in poultry. Foot and mouth disease is a common viral disease in cattles. Anthrax is also found in cattles. Pebrine is a protozoan disease of silkworms

143 **(d)**
Plant tissue culture is the technique of *in vitro* maintaining and growing plant cells, tissue or organ aseptically on artificial medium in suitable container under controlled conditions

148 **(c)**
Cross hybridization is a time consuming and tedious process because it involves emasculation and bagging techniques to transfer desired pollen grains to a desire plant

149 **(b)**
The germ plasm collections are usually maintained at a low temperature in the form of seeds. The stored seeds are grown periodically in the field to obtain fresh seed. This is necessary because the seed germination decreases with storage time

151 **(a)**
GDP – Gross Domestic Product

152 **(d)**
List of fortified crop varieties released by

Crops	Nutrient rich in
Carrot, spinach and pumpkin	Vitamin-A
Bitter gourd, bathua, mustard and tomato	Vitamin-C
Spinach and bathua	Iron and calcium
Broad bean, lablab, french bean and garden pea	Protein

154 **(a)**
Norin-10 gene of dwarfness in wheat was orginated in Japan

155 **(d)**
III and IV.
Animal husbandry is the agricultural practice of feeding, breeding and raising animal livestock whose primary purpose is to provide meat and milk. Meat animals include beef, cattle, sheep and meat goats. Milk animals include cows and buffaloes.
Poultry is a class of domesticated fowl used for food and for their eggs. Fisheries is also an important source of animal food, which is concerned with rearing, catching and selling of fish, molluscs (shell fish) and crustaceans prawns, crabs, etc.

156 **(b)**
Totipotency is the inherent capability of a single cell to provide the genetic programme required to direct the development of an entire individual

159 **(c)**
The method of growing or producing thousands of plants through tissue culture is called micropropagation

160 **(a)**
Mutation breeding is defined as the process of breeding by artificially inducing mutations using chemicals (like aniline, nitrous acid mustard gas, etc.) or radiation (like gamma rays, X-rays, UV rays, etc.)

162 **(a)**
Cyanobacteria.
Single cell proteins are the dried cells of microorganisms belonging to bacteria, yeasts, moulds, higher fungi and some algae
Bacteria – *Methylophilus methylotrophus*
Yeast – *Candida utilis*
Cyanobacteria - *Spirulina*

164 **(a)**
The nutrient medium for tissue culture should have sucrose, inorganic salts, growth regulators, vitamins and amino acids

166 **(d)**
Mating of individuals from entirely different breed is called cross-breeding. It is the method of breeding superior male of one breed with superior female of another breed in order to combine the desirable qualities of two different breeds in the progeny. The hybrid progeny may be used directly for commercial production

168 **(b)**
Inbreeding involves
(i) Identification and mating of superior males and superior females of the same breed in pairs
(ii) Progeny obtained from such mating are evaluated and assessed for the desirable traits
(iii) Again, the superior males and females are identified from the progeny
(iv) It should be kept in mind that a superior cow or buffalo is that which gives more milk per lactation. Similarly, a superior bull is that which

gives rise to superior progeny as compared to those of other bulls
(v) This process is continued for 4-6 generation

169 **(d)**
Single cell proteins are the dried cells of microorganisms belonging to bacteria, yeasts, moulds, higher fungi and some algae
Bacteria – *Methylophilus methylotrophus*
Yeast – *Candida utilis*
Cyanobacteria - *Spirulina*

170 **(c)**
Biofortification differs from ordinary fortification because it focusses on making plant foods more nutritious as the plants are growing rather than nutrients added to the foods when they are being processed

172 **(a)**
Hairy leaves of many plants are associated with resistance to insect pests. For example, resistance to Jassids in cotton and cereal leaf beetle in wheat

174 **(a)**
A-Cow, B-Male, C-Bull, D-Superior progeny

177 **(d)**
Low, nitrogen, sugar and high aspartic acid in maize develops resistance to maize stem borers

179 **(c)**
Black rot of crucifer-Bacterial disease

180 **(a)**
High yielding and disease resistant wheat varieties were introduced in India in 1963, *e. g.*, Sonalika and Kalyan Sona

181 **(a)**
The most commonly maintained species of the bee by bee keepers is *Apis mellifera.* At present time, *Apis mellifera* is used in apiaries for large scale production of honey and wax

184 **(a)**
High yielding and disease resistant wheat varieties are Sonalika and Kalyan Sona. Ratna and Jaya are semi-dwarf varieties of rice

185 **(b)**
In cotton smooth leaf and absence of nector repel boll worms

186 **(d)**
Tissue culture technique can be utilized for the production of virus-free plants either by meristem culture chemotherapy or selective chemotherapy of larger explants from donor plants. Shoot apex consists of meristematic-cells, thus shoot apex culture is successful to obtain virus-free clones in crop improvement programmes

188 **(d)**
A callus is an amorphous mass of loosely arranged thin walled parenchyma cells developing from proliferating cells of parents tissue
An explant excised from a stem, tuber or root is used for callus formation

190 **(a)**
Plant tissue culture is a technique of growing cells, tissues or organs in sterilized nutrient media under controlled aseptic condition. The plant materials to be cultured may be cells, tissues or plant organs. The plant part which is used to culture is called explant

191 **(d)**
Increasing homozygosity due to inbreeding results decrease in variation with in the group and stabilization of a particular type (*i.e.,* pureline)

192 **(c)**
Both (a) and (b). Hilsa and Pomfrets
The common marine fish varieties popularly consumed as food are hilsa, sardines, macherel, tuna, pomfrets, eel, Bombay duck, etc.

194 **(b)**
Deoni is a dual purpose breed usually famales are good milk yielder and the males serves in ploughing

195 **(d)**
The animals that we would expect in a dairy are cows, buffaloes, sheep and goats

199 **(a)**
MOET is program for herd improvement in animal like cattle sheep, rabbits, buffaloes, mare, etc.
A cow is administered hormones with FSH-like activity to induce follicular maturation and supper ovulation
The cow produces 6-8 eggs instead of one egg produced normally
It is now, either mated with an elite bull or artificial insemination is carried out
When the fertilized eggs attain 8-32 cells stage, they are non-surgically removed and transferred to a surrogate mother
The genetic mother can now be again super-ovulated

201 **(a)**
Selection is the oldest method of crop improvement

The act or process of mating organisms of different varieties or species to create a hybrid is called hybridization

An organism which possesses more than two sets of chromosomes is called polyploidy, *e. g.*, *Triticale* is the first man made crop derived by crossing wheat and rye

The application of induced mutations for crop improvement is called mutation breeding

Our conventional method of crop improvement involve the whole genomes of plants. However, the latest genetic engineering involves transfer of one or more genes from one plant to another. The plant is which a foreign genes have been introduced is called transgenic plant

203 **(a)**

The maintenance of hives of honey bees for the production of honey is termed bee keeping or apiculture. Bee-keeping is practiced in any area where there is availability of sufficient bee pasture of some wild shrubs, fruit orchards and cultivated crops

205 **(d)**

Easy to Grow Microbes can be grown on materials like waste water from potato processing plants, straw, molasses, animal manure and sewage

(i) **Nutrient Rich** Provide food rich in protein, minerals, fats, carbohydrates and vitamin

(ii) **High Yield** Due to high rate of biomass production and growth, large amounts are produced

206 **(c)**

Cultivation of axillary or apical shoot meristem is known as meristem culture. It involves the development of an already existing shoot meristem and subsequently the regeneration of adventitious roots from the developed shoots. Meristem culture can be used for rapid clonal multiplication, production of virus free plants, germplasm conservation and production of transgenic plants

207 **(c)**

Sonalika and Kalyan Sona.

High yielding and disease resistant wheat varieties were introduced in India in 1963, *e. g.*, Sonalika and Kalyan Sona

209 **(d)**

Plant breeding programme designed to increase the vitamins, minerals, higher protein and heat their fat content in crop yields is called biofortification

212 **(a)**

In callus culture, shoot and root regenerations are controlled, generally, by auxin-cytokinin balance. Usually, the excess of auxin (such as Naphthalene acetic. Acid or NAA), promotes root regeneration, whereas that of cytokinin (like BAP) promotes shoot regeneration

213 **(a)**

Semi-dwarf varieties of rice were developed from IR-8 and Taichung Native-1

215 **(c)**

India's wheat yield revolution in the 1960s was possible primarily due to the quantitative trait mutations

221 **(b)**

Single cell protein refers to sources of mixed proteins extracted from pure or mixed culture of organisms or cell

223 **(c)**

The introduction of high yielding varieties of seeds and the increased use of fertilisers and irrigation are known collectively as the green revolution, which provided the increase in production needed to make India self sufficient in food grains, thus improving agriculture in India

224 **(b)**

When the nuclear genetic material of one of the parents is eliminated through the cytoplasm from both the parents are retained, such a fusion product is called hybrid (cytoplasmic hybrid or heteroplast)

226 **(a)**

The deficiency of essential micronutrients specially iron, iodine, zinc and vitamin-A in food increases the risk for diseases, reduces mental ability and life span

228 **(a)**

The method of producing thousands of plants through tissue culture is called micropropagation. Each of these plants will be genetically identical to the original plant from which they were grown, *i.e.*, they are somaclones. Many important food plants like tomato, banana, apple, etc., have been produced on commercial scale using this method

235 **(c)**

Germplasm is the sum to total of all the alleles of the genes present in a crop and its related species. The entire collection of plants/seeds having all

the diverse alleles for all genes in a given crop is called germplasm collection. A good germplasm collection is essential for a successful breeding program

236 **(d)**
The chances of catching bird flu from a property cooked chicken and egg can be nil. The major causes of diseases in the poultry birds are overcrowding, dampness, insufficient light, unhygienic environmental condition and dirty air

237 **(a)**
Callus is an unorganized and undifferentiated mass of actively plant cells grown on culture medium from an explant. In 1939 White, Gautheret and Nobecourt independently succeeded in raising callus

238 **(c)**
The term 'totipotency' refers to the development of an organ from a cell in a culture medium

242 **(a)**
All given statements are correct

245 **(a)**
A-Female horse; B-Male donkey.
Mating between male and female animals of two different species is called interspecific hybridization. The Mule is the best example of a successful cross between two different species, the female horse and the male donkey

246 **(c)**
A natural mutant of *T. turgidum* is represented by tetraploid *T. durum* ($4n=28$) which was crossed with diploid wild grass, *Aegilops squarrosa* ($2n=14$) under natural conditions. The resultant triploid hybrid was sterile which on doubling of chromosomes produced the hexaploid bread wheat. *Triticum aestivum* ($6n=42$)

247 **(d)**
Interspecific hybridization.
Mating between male and female animals of two different species is called interspecific hybridization. The Mule is the best example of a successful cross between two different species, the female horse and the male donkey

251 **(d)**
An explant is the excised piece of tissues or organs used for culture. An explant before organogenesis is heterotrophic which grows on a synthetic medium and sucrose is the most commonly used carbon source

254 **(a)**
Production of edible proteins on a large scale by means of microorganisms for animal and human nutrition is called single cell protein

258 **(d)**
All of these.
Mutation breeding is defined as the process of breeding by artificially inducing mutations using chemicals (like aniline, nitrous acid mustard gas, etc.) or radiation (like gamma rays, X-rays, UV rays, etc.)

259 **(a)**
The genetic ability of a plant to prevent pathogen from causing disease is called resistance

262 **(a)**
Phytotron is a chamber, in which the plants can be grown in controlled condition for the study of the effects of environmental conditions on their growth

263 **(a)**
Sometimes other improved techniques are carried out to ensure successful production of hybrids. One such technique is Multiple Ovulation Embryo Transfer Technology (MOET) for herd improvement in animals like cattle, sheep, rabbits, buffaloes. In this high milk yielding breeds of female have been breed with high quality meat yielding bull to increase hard size in lesser time

268 **(a)**
Usually the most common places for keeping beehives are courtyard, on the verandah of the house, on the roof, in the crop fields during flowering period, etc.
The beehives when kept in the fields of sunflower, *Brassica,* apple and pear, increase the pollination efficiency of flowering plants and improve the yields. A successful bee keeping requires management of beehives during different seasons

272 **(d)**
The semen may be used immediately or can be frozen. Frozen bovine semen is a method of preserving semen for future artificial insemination, even after the death of the donor

274 **(a)**
MOET This technique has been successfully used for cattle rabbits, sheep, cows, buffaloes, mares etc. Animal breeders are hopefully looking forward to increase the herd size in a short time by using this technique

276 **(a)**

The most common species of honey bee is *Apis indica*. The exotic varieties are *Apis mellifera* (An Italian variety) and *Apis adamsoni*. At present, the Italian variety *Apis mellifera* is used in apiaries for large scale production of honey and wax

278 **(b)**
Outbreeding.
Rearing of honey bees is practiced for obtaining honey and wax. Honey is used as a food of very high nutritive value, while bees wax is used in industry to prepare cosmetics and polishes

279 **(d)**
Saccharum barberi and *S. officinarum* these two species were crossed to have sugar cane varieties combining the desirable qualities of high sugar, high yield, thick stems and ability to grow in the sugar cane belt of North India

280 **(d)**
All of these.
Easy to Grow Microbes can be grown on materials like waste water from potato processing plants, straw, molasses, animal manure and sewage
(i) **Nutrient Rich** Provide food rich in protein, minerals, fats, carbohydrates and vitamin
(ii) **High Yield** Due to high rate of biomass production and growth, large amounts are produced

289 **(a)**
The yellow colour of cow milk is due to the carotene, which is precursor for yellow colour in cows milk and it is in the form of vitamin-A

292 **(d)**
Fisheries is an industry, where fish are reared for commercial purposes. Fisheries include rearing, catching, selling, etc., of fish, molluscs (shell-fish) and crustaceans (prawns, crabs, etc.)

293 **(d)**
The wax gland in honey bee is found in workers. The wax gland complex of the honey bee worker consists of 3 cells types, epithelial cells, oenocytes and adipocytes, which act synergistically to secrete wax, a complex mixture of hydrocarbons, fatty acids and proteins (lipophorins)

294 **(d)**
Inbreeding refers to mating of more closely related individuals within the same breed for 4-6 generations

295 **(d)**
All the points given in the question are required to get the desired character into the crop

297 **(a)**
The process of fusion of protoplast of somatic cells obtained from different varieties or species of plant on a suitable nutrient medium *in vitro* to develop a somatic hybrid is called somatic hybridization

298 **(a)**
Pisciculture is the breeding, hat ching and rearing of fish under controlled condition

299 **(b)**
Susceptibility, aggressive pathogen and conductive environment are responsible for development of disease in a plant

300 **(b)**
Catla, rohu, common carp are fresh water fishes

301 **(a)**
The temperature of poultry shed should be optimum not high or not to low

302 **(a)**
SCP production is based on industrial effluents so it helps to minimize environment pollution
Spirulina can be grown easily on material like waste water from potato processing plants, straw, molasses, animal manure and even sewage. Such utilization also reduces environmental pollution

303 **(d)**
Conventional agriculture production of cereals, pulses, vegetables, fruits, etc., may not be able to meet the demand of food at the rate at which human and animal population is increasing. More than 25% of human population is suffering from hunger and malnutrition. One of the alternate sources of proteins for animal human nutrition is **single cell protein**

306 **(d)**
All of these.
Poultry includes the class of domesticated fowl (birds) used for food or for their eggs. The common poultry birds are chickens, turkeys, ducks, geese, quinea-fowls and pigeons

307 **(d)**
Pomato.
Pomato is somatic hybrid between potato and tomato and Bomato is somatic hybrid between brinjal and tomato. Somatic hybrid are also produced between rice and carrot

308 **(b)**
Micropropagation can be defined as growing plants from seed or small pieces of tissue under sterile conditions in a laboratory on specially

selected media. This techniques include *in vitro* (Literally –in glass) laboratory propagation from vegetative material and germination of seeds and spores

311 **(d)**
None of above statement is false

312 **(b)**
The capacity of a cell explant to grow into a whole plant is called totipotency

314 **(a)**
Emasculation is the process of removal of anthers from a bisexual flower before the anthers get maturd

316 **(d)**
All of these.
Three billion people suffer form protein, vitamins, and micronutrient deficiencies or hidden hunger because these people can not afford to buy enough vegetable, fruits, legumes, fish and meat. Their food does not contain essential micronutrients specially iron, iodine, zinc and vitamin-A. Breeding of crops with higher levels of vitamins, minerals or higher protein and healthier fats is called biofortification. This is the most practical aspect to improve the health of the people

317 **(c)**
Somatic hybridization involves the fusion of protoplasts of two different species which results in the formation hybrids. Naked protoplasts are obtained by dissolution of their cell walls by the macerating enzymes such as pectinase and cellulose. Fusion of protoplasts from the two different varieties can be enhanced by treating with Polyethylene Glycol (PEG) in presence of high voltage electric current

319 **(a)**
Mirobes Like *Spirulina, Methylophilus methylotropus* can be grown in industrial scale as sources of good protein

320 **(b)**
Resistance is the capacity of plants to resist, withstand, lessen and overcome the attacks of pathogens. Some host genotypes have the ability to prevent a pathogen strain from producing disease. Such host lines are called resistant and this ability is called disease resistance. Disease resistance crop is obtained from crossing with wild varieties

321 **(d)**
More than 70% of the world livestock population is in India and China, but its contribution is only 25%

323 **(a)**
Pollen culture haploid plants may be obtained from the pollen grains by placing anther or isolated pollen grains on a suitable culture medium

328 **(c)**
Rearing of honey bees is practiced for obtaining honey and wax. Honey is used as a food of very high nutritive value, while bees wax is used in industry to prepare cosmetics and polishes

330 **(d)**
The common marine fish varieties popularly consumed as food are hilsa, sardines, macherel, tuna, pomfrets, eel, Bombay duck, etc.

331 **(b)**
Biofortification differs from ordinary fortification because it focusses on making plant foods more nutritious as the plants are growing rather than nutrients added to the foods when they are being processed

333 **(d)**
Professor FC Steward of Cornell University (USA) demonstrated that mature cells removed from a carrot and placed in a suitable culture solution could be stimulated to start dividing again and to provide new carrot plants (totipotency). Totipotency is the inherent capability of a single cell, which provides the genetic programme required to direct the development of an entire individual

334 **(b)**
Honey is a neutral sweet syrup extracted from the tires of honey bees. The chemical composition of honey is ash 01.00%, enzyme and pigments 02.21%, maltose and other sugar 08.81%, water 17.20%, dextrose 21.28% and levulose 88.90%

336 **(c)**
Atlas-66, soft wheat, has been used since 1953 as a genetic source of higher protein in wheat. It has been used as a donor for improving cultivated wheat

338 **(a)**
Semi-dwarf rice varieties were introduced in India in 1966. Semi-dwarf varieties of rice were developed from IR-8 and Taichung Native-1

339 **(b)**

Cultivation of fishes in artificially prepared ponds or water bodies is called pisciculture. Fish farming in isolated water bodies is called pisciculture

346 **(c)**
The practices concerned with the improvement in animal husbandry include management of farm and farm animals and animal breeding

350 **(c)**
Several South Indian states raise 2-3 crops of rice annually. The agronomic feature that makes this possible is because of early yielding rice variety

352 **(c)**
Animal breeding is producing improved breeds of domesticated animals, by improving their genotype through selective mating

353 **(b)**
A 250 kg cow produces 200g of protein per day. In the same period, 250 g of a microorganism like *Methylophilus methylotrophus,* because of its high rate of biomass production and growth, can be expected to produce 25 tonnes of protein

357 **(d)**
Green revolution depended mainly on plant breeding techniques for high yielding and disease resistant varieties in wheat. This was all done by the efforts of Prof. MS Swaminathan who is also called father of green revolution in India

358 **(d)**
Crustacean fishery is connected with exploitation of lobsters, crabs and prawns

359 **(c)**
The art and science of combining, ideas, facilities, process, materials and labour to produce and market a worth while produce or service successfully called management

360 **(a)**
Poultry.
Poultry includes the class of domesticated fowl (birds) used for food or for their eggs. The common poultry birds are chickens, turkeys, ducks, geese, quinea-fowls and pigeons

361 **(b)**
All the given symptoms are infectious coryza disease of poultry birds

366 **(a)**
It is estimated that more than 70% of the world livestock population is in India and China. However, it is surprising to not that the contribution to the world farm produce is only 25%, *i.e.,* the productivity per unit is very low

367 **(d)**
The plant tissue or organ excised and used for *in vitro* culture is known as explant. Any plant part such as shoot tip, root tip, leaf tip, pollen grains, etc., may be used as an explant. The choice of explant depends mainly on the objective of the culture and the regeneration potential of the different organs of a plant species

371 **(b)**
Alfatoxicosis represents one of the serious diseases of poultry, livestock and other animals. The cause of this disease in poultry and other food producing animals has been attributed to the ingestion of various feeds contaminated with *A. flavus*

372 **(b)**
Haploids have a single genome as found in the gametes of the species. A haploid has only one copy of each chromosome and is highly sterile. Guha and Maheshwari (1964) developed a culture technique to produce haploid plants
It is called androgenic haploid culture, in which very young unopened sterilized flowers are opened to remove young anthers. Anthers are introduced over culture medium for 4-6 weeks, to a give rise to large number of embryoids (haploids)

374 **(c)**
1963.
High yielding and disease resistant wheat varieties were introduced in India in 1963, *e. g.*, Sonalika and Kalyan Sona

376 **(d)**
Bees are the pollinators of many of our crop species, such as sunflower, *Brassica,* apple and pear

377 **(a)**
Somaclones are obtained by tissue culture. The plant regenerated from cell and tissue cultures shows heritable variation for both qualitative and quantitative traits. Plant breeding is the branch of biology, which is concerned with developing varieties superior to existing one. Irradiation means exposure to any form of radiation. Genetic engineering is the technique by which genetically modified organisms are obtained

379 **(c)**
Mirobes Like *Spirulina, Methylophilus methylotropus* can be grown in industrial scale as sources of good protein

381 **(d)**
Shakti, Rattan and Protina are recently developed composite (germplasm complex) varieties of maize, which have a higher lysine and tryptophan content than traditional maize varieties

382 **(c)**
The part of the plant taken for tissue culture is called explant

383 **(c)**
Lysine is an essential amino acid found in maize

384 **(d)**
The application of induced mutations for crop improvement is called mutation breeding. The agents which are used to induce mutations are called mutagens

386 **(c)**
In this case, more number of genes for high yielding milk are inherited from both the parents

387 **(b)**
International Centre for Wheat and Maize Improvement Mexico.
Semi-dwarf rice varieties were introduced in India in 1966. Semi-dwarf varieties of rice were developed from IR-8 and Taichung Native-1

389 **(d)**
In bhindi (*Abelmosshcus esculentus*) resistance to yellow mosaic virus was introduced from a wild species resulting a new variety called Parbhani kranti

392 **(b)**
New castle Disease (ND) is a highly contagious disease of birds caused by a paramyxo virus

393 **(b)**
A-One, B-Ovary, C-Ovulation, D-Hormone, E-More, F-4 to 10, G-Surrogate mother

395 **(b)**
The SCP is rich in high quality of protein and poor in fat content

399 **(c)**
250 g of a microorganism like *Methylophilus methylotropus* because of its high content of biomass production and growth, can be produce about 25 tonnes of protein

401 **(c)**
Crustaceans from very large group of arthopods, which include crabs, lobsters prawns, etc.

402 **(a)**
Saccharum barberi and *Saccharum officinarum* are varieties of sugar cane. *S. barberi* and *S. officinarum* were crossed to obtain sugar cane varieties having desirable qualities

403 **(d)**
Conventional plant breeding is in practice from the 9000-11000 years ago. Most of our major food crops are derived from the domesticated varieties. But now due to advancements in genetics, molecular biology and tissue culture, plant breeding is being carried out by using molecular genetic tools.
Classical plant breeding includes hybridization of purelines, artificial selection to produce plants with desirable characters of higher yield, nutrition and resistance to disease

407 **(d)**
In mung bean, resistance to yellow mosaic virus acid powdery mildew were introduced by mutations

409 **(a)**
Apiculture is the rearing of bee or bee keeping for the production of honey and wax

410 **(a)**
Quality of breeds.
In dairy farm management, the people deals 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

416 **(a)**
The management of animals for milk and its products for human consumption is called dairying. Milk yield here is dependent primarily on the quality of breeds

417 **(c)**
The cell walls of cells are digested by enzymes like pectinase and cellulose to expose the naked protoplast

419 **(d)**
All of these are advantages of tissue culture/miropropagation

421 **(d)**
Crustacean fishery is connected with exploitation of lobster crab and prawn

422 **(d)**
Cross breeding refers to the cross of superior males of one breed with superior females of another breed. The progeny may be used for commercial production, *e. g.*, a new sheep breed Hisardale
In case of artificial insemination the semen can be used immediately or can be frozen for later use

Artificial insemination is a method of controlled breeding in which semen from the selected male parent is injected into the reproductive tract of the selective female parent. Multiple Ovulation Embryo Transfer (MOET) Technology is a programme for herd improvement

425 **(c)**
Culturing of aquatic plant and animal is done in fresh water bodies is called aquaculture

426 **(d)**
Virus.
Bird flu resembles influenza and is caused by a virus H5N1. The virus enters the man through chicken

427 **(d)**
The host crop plant may be resistant to insect pests due to morphological, biological and physiological characteristics
For Examples
(i) Hairy leaves of plants resistance to jassids in cotton and cereal leaf beetle in wheat
(ii) In maize, high aspartic acid, low nitrogen and sugar content protect them from stem borers

429 **(a)**
Outbreeding refers to the mating of unrelated animals belonging to
(i) Individuals of the same breed but having no common ancestors
(ii) Individuals of the different breeds (cross breeding)
(iii) Individuals of different species (inter-specific hybridization)
Thus, outbreeding may be divided into three different types on the basis of the individual selected for mating. These are outcrossing, crossbreeding, interspecific hybridization and controlled breeding using artificial insemination

430 **(a)**
A-Cellulase and pectinase, B-Polyethylene glycol, C-Somatic hybrid cell

431 **(b)**
Variety of wheat is Himgiri Pusa A-4

432 **(c)**
Seeds from virus infected plants generally do contain the virus. Therefore, sexual progeny are usually virus free, except for new-infections. But this belief is not entirely correct. In case of sexually reproducing crop virus infections spread rapidly.
This is because of vegetative propagules from virus infected plants contain virus particle, hence in vegetatively propagated plants the virus gets transmitted through propagule (rhizome/bulb/tuber/root). But the growing bud is not infected (*i.e.,* shoot tips are virus free)

433 **(a)**
Bird flu resembles influenza and is caused by a virus H5N1. The virus enters the man through chicken

434 **(c)**
When a hybrid is produced by fusion of somatic cells of two varieties or species, it is called as somatic hybrid. The process of producing somatic hybrids is called somatic hybridisation. The hybrid protoplast contains characters of both parental protoplast

435 **(a)**
Norman E Borlaug.
In 1963 the increase in crop production was due to introduction of semi-dwarf varieties of wheat. Semi-dwarf wheat was developed by Norman E. Borlaug at International Centre for Wheat and Maize Improvement in Mexico. Semi-dwarf varieties of rice were developed from IR-8 (developed at International Research Institute Phillipines) and Taichung Native-1 (developed in Taiwan)

436 **(a)**
The microorganisms used in the production of SCP use such substrates which otherwise cause pollution. Therefore, production of SCP helps in reduction of pollution

437 **(a)**
Inbreeding refers to mating between closely related individuals with in the same breeds for 4-6 generation. It identify superior males and superior females

439 **(d)**
A-*Saccharum barberi;* B-*Saccharum officinarum*

440 **(d)**
Some of the fresh water fishes, which are very common include rohu, catla, calbasu, mrigal, chital, common carp, etc.

444 **(d)**
Molluscs has a shell-like exoskeleton. So, molluscs are also called as shell fish

445 **(b)**
Micropropagation.

Micropropagation can be defined as growing plants from seed or small pieces of tissue under sterile conditions in a laboratory on specially selected media. This techniques include *in vitro* (Literally –in glass) laboratory propagation from vegetative material and germination of seeds and spores

446 **(c)**
Bee-keeping or apiculture is an important enterprise of agriculture concerned with the maintenance of hives of honey bees for the production of honey and wax

447 **(a)**
Poultry includes the class of domesticated fowl (birds) used for food or for their eggs. The common poultry birds are chickens, turkeys, ducks, geese, quinea-fowls and pigeons

448 **(d)**
G Haberlandt gave the idea that every cell is totipotent

450 **(d)**
Crab, oyster, lobster are edible aquatic animal

453 **(c)**
In dairy farm management, the people deals 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

456 **(d)**
The process of breeding, when occurs between closely related individuals of the same breed, is called inbreeding. On the other hand, the process of breeding between unrelated animals, which may be between different breeds or different species, is called outbreeding

458 **(b)**
Father of white revolution in India is verghese kurein. White revolution is huge production of milk in 1970s in dairy milk and milk products

459 **(d)**
Dharwar American variety of cotton is the product of parasexual hybridization

463 **(a)**
All given statements are correct