

AIPMT

Botany & Zoology Solution 03-04-10

51. In vitro fertilisation is a technique that involves transfer of which one of the following into the fallopian tube?
- (1) Embryo only, upto 8 cell stage
 - (2) Either zygote or early embryo upto 8 cell stage
 - (3) Embryo of 32 cell stage
 - (4) Zygote only
51. (3)
52. Which one of the following structures between two adjacent cells is an effective transport pathway?
- (1) Plasmodesmata
 - (2) Plastoquinones
 - (3) Endoplasmic reticulum
 - (4) Plasmalemma
52. (1)
53. Single-celled eukaryotes are included in:
- (1) Protista
 - (2) Fungi
 - (3) Archaea
 - (4) Monera
53. (1)
54. The genetically-modified (GM) brinjal in India has been developed for:
- (1) Insect-resistance
 - (2) Enhancing shelf life
 - (3) Enhancing mineral content
 - (4) Drought-resistance
54. (1)
55. In unilocular ovary with a single ovule the placentation is:
- (1) Marginal
 - (2) Basal
 - (3) Free Central
 - (4) Axile
55. (2)
56. An element playing important role in nitrogen fixation is:
- (1) Molybdenum
 - (2) Copper
 - (3) Manganese
 - (4) Zinc
56. (1)
57. Sertoli cells are found in:
- (1) ovaries and secrete progesterone
 - (2) adrenal cortex and secretes adrenaline
 - (3) seminiferous tubules and provide nutrition to germ cells
 - (4) pancreas and secrete cholecystokinin
57. (3)
58. Which one of the following cannot be explained on the basis of Mendel's Law of Dominance?
- (1) The discrete unit controlling a particular character is called a factor
 - (2) Out of one pair of factors one is dominant, and the other recessive
 - (3) Alleles do not show any blending and both the characters recover as such in F₂ generation
 - (4) Factors occur in pairs
58. (4)
59. Apomictic embryos in citrus arise from:
- (1) Synergids
 - (2) Maternal sporophytic tissues in ovule
 - (3) Antipodal cells
 - (4) Diploid egg
59. (2)

60. One example of animals having a single opening to the outside that serves both as mouth as well as anus is:
(1) Octopus (2) Asterias (3) Ascidia (4) Fasciola

60. (4)

61. Select the correct statement from the ones given below:

- (1) Barbiturates when given to criminals make them tell the truth
- (2) Morphine is often given to persons who have undergone surgery as a pain killer
- (3) Chewing tobacco lowers blood pressure and heart rate
- (4) Cocaine is given to patients after surgery as it stimulates recovery

61. (2)

62. Listed below are four respiratory capacities (a – d) and four jumbled respiratory volumes of a normal human adult:

<i>Respiratory capacities</i>	<i>Respiratory volumes</i>
(a) residual volume	2500 mL
(b) Vital capacity	3500 mL
(c) Inspiratory reserve volume	1200 mL
(d) Inspiratory capacity	4500 mL

Which one of the following is the correct matching of two capacities and volumes?

- (1) (b) 2500 mL, (c) 4500 mL
- (2) (c) 1200 mL (d) 2500 mL
- (3) (d) 3500 mL (a) 1200 mL
- (4) (a) 4500 mL (b) 3500 mL

62. (3)

63. The chief water conducting elements of xylem in gymnosperms are:

- (1) Vessels (2) Fibres (3) Transfusion tissue (4) Tracheids

63. (4)

64. Ringworm in humans is caused by:

- (1) Bacteria (2) Fungi (3) Nematodes (4) Viruses

64. (2)

65. Which one of the following is not a micronutrient?

- (1) Molybdenum (2) Magnesium (3) Zinc (4) Boron

65. (2)

66. Membrane-bound organelles are absent in:

- (1) Saccharomyces (2) Streptococcus (3) Chlamydomonas (4) Plasmodium

66. (2)

67. Vasa efferentia are the ductules leading from:

- (1) testicular lobules to rete testis (2) Rete testis to vas deferens
- (3) Vas deferens to epididymis (4) Epididymis to urethra

67. (2)

68. Select the correct statement from the following:

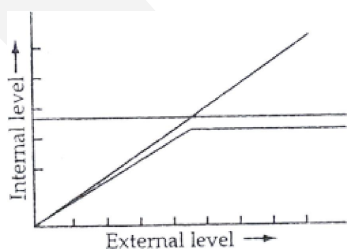
- (1) Biogas is produced by the activity of aerobic bacteria on animal waste
- (2) Methanobacterium is an aerobic bacterium found in rumen of cattle
- (3) Biogas, commonly called gobar gas, is pure methane
- (4) Activated sludge–sediment in settlement tanks of sewage treatment plant is a rich source of aerobic bacteria

68. (4)

69. Select the two correct statements out of the four (a–d) given below about lac operon.
- Glucose or galactose may bind with the repressor and inactivate it
 - In the absence of lactose the repressor binds with the operator region
 - The *z* – gene codes for permease
 - This was elucidated by Francois Jacob and Jacques Monod
- The correct statements are :
- (b) and (c)
 - (a) and (c)
 - (b) and (d)
 - (a) and (b)
69. **(3)**
70. Keel is characteristic of the flowers of :
- Gulmohur
 - Cassia
 - Calotropis
 - Bean
70. **(4)**
71. The kind of epithelium which form the inner walls of blood vessels is :
- cuboidal epithelium
 - columnar epithelium
 - ciliated columnar epithelium
 - squamous epithelium
71. **(4)**
72. Which one of the following has its own DNA?
- Mitochondria
 - Dictyosome
 - Lysosome
 - Peroxisome
72. **(1)**
73. Transfer of pollen grains from the anther to the stigma of another flower of the same plant is called:
- Xenogamy
 - Geitonogamy
 - Karyogamy
 - Autogamy
73. **(2)**
74. The genotype of a plant showing the dominant phenotype can be determined by:
- Test cross
 - Dihybrid cross
 - Pedigree analysis
 - Back cross
74. **(1)**
75. PGA as the first CO₂ fixation product was discovered in photosynthesis of :
- Bryophyte
 - Gymnosperm
 - Angiosperm
 - Alga
75. **(4)**
76. Study the four statements (a–d) given below and select the two correct ones out of them:
- A lion eating a deer and a sparrow feeding on grain are ecologically similar in being consumers
 - Predator star fish *Pisaster* helps in maintaining species diversity of some invertebrates
 - Predators ultimately lead to the extinction of prey species
 - Production of chemicals such as nicotine, strychnine by the plants are metabolic disorders
- The two correct statement are:
- (a) and (c)
 - (c) and (d)
 - (a) and (d)
 - (a) and (b)
76. **(4)**
77. Seminal plasma in human males is rich in :
- fructose and calcium
 - glucose and calcium
 - DNA and testosterone
 - ribose and potassium
77. **(1)**
78. *ABO* blood groups in humans are controlled by the gene *I*. It has three alleles –*I^A*, *I^B* and *i*. Since there are three different alleles, six different genotypes are possible. How many phenotypes can occur?
- Three
 - One
 - Four
 - Two
78. **(3)**
79. Breeding of crops with high levels of minerals, vitamins and proteins is called:
- Somatic hybridisation
 - Biofortification
 - Biomagnification
 - Micropropagation
79. **(2)**

80. A common biocontrol agent for the control of plant diseases is :
 (1) Baculovirus (2) Bacillus thuringiensis (3) Glomus (4) Trichoderma
 80. **(2)**
81. Widal tests is used for the diagnosis of :
 (1) Malaria (2) Pneumonia (3) Tuberculosis (4) Typhoid
 81. **(4)**
82. Injury to adrenal cortex is not likely to affect the secretion of which one of the following?
 (1) Aldosterone
 (2) Both Androstenedione and Dehydroepiandrosterone
 (3) Adrenaline
 (4) Cortisol
 82. **(3)**
83. Low Ca^{++} in the body fluid may be the cause of :
 (1) Tetany (2) Anaemia (3) Angina pectoris (4) Gout
 83. **(1)**
84. Which one of the following pairs is incorrectly matched?
 (1) Glucagon – Beta cells (source)
 (2) Somatostatin – Delta cells (source)
 (3) Corpus luteum – Relaxin (secretion)
 (4) Insulin – Diabetes mellitus (disease)
 84. **(1)**
85. Select the correct statement from the ones given below with respect to dihybrid cross.
 (1) Tightly linked genes on the same chromosome show higher recombinations
 (2) Genes far apart on the same chromosome show very few recombinations
 (3) Genes loosely linked on the same chromosome show similar recombinations as the tightly linked ones
 (4) Tightly linked genes on the same chromosome show very few recombinations
 85. **(4)**
86. Which one of the following statements in regard to the excretion by the human kidneys is correct?
 (1) Descending limb of Loop of Henle is impermeable to water
 (2) Distal convoluted tubule is incapable of reabsorbing HCO_3^-
 (3) Nearly 99 percent of the glomerular filtrate is reabsorbed by the renal tubules
 (4) Ascending limb of Loop of Henle is impermeable to electrolytes
 86. **(3)**
87. The nerve centres which control the body temperature and the urge for eating are contained in:
 (1) Hypothalamus (2) Pons (3) Cerebellum (4) Thalamus
 87. **(1)**
88. The biomass available for consumption by the herbivores and the decomposers is called:
 (1) Net primary productivity (2) Secondary productivity
 (3) Standing crop (4) Gross primary productivity
 88. **(1)**
89. If due to some injury the chordae tendinae of the tricuspid valve of the human heart is partially non-functional, what will be the immediate effect?
 (1) The flow of blood into the aorta will be slowed down
 (2) The 'pacemaker' will stop working
 (3) The blood will tend to flow back into the left atrium
 (4) The flow of blood into the pulmonary artery will be reduced
 89. **(4)**

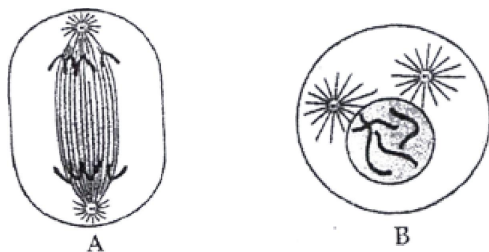
90. Ovary is half-inferior in the flowers of:
 (1) Guava (2) Plum (3) Brinjal (4) Cucumber
90. **(2)**
91. Which one of the following is used as vector for cloning genes into higher organisms?
 (1) Baculovirus (2) Salmonella typhimurium
 (3) Rhizopus nigricans (4) Retrovirus
91. **(4)**
92. The one aspect which is not a salient feature of genetic code, is its being :
 (1) Degenerate (2) Ambiguous (3) Universal (4) Specific
92. **(2)**
93. Which one of the following is an example of ex-situ conservation?
 (1) Wildlife sanctuary (2) Seed bank
 (3) Sacred groves (4) National park
93. **(2)**
94. Which one of the following palindromic base sequences in DNA can be easily cut at about the middle by some particular restriction enzyme?
 (1) 5' ——— CGTTCG ——— 3' 3' ——— ATGGTA ——— 5'
 (2) 5' ——— GATATG ——— 3' 3' ——— CTAATA ——— 5'
 (3) 5' ——— GAATTC ——— 3' 3' ——— CTTAAG ——— 5'
 (4) 5' ——— CACGTA ——— 3' 3' ——— CTCAGT ——— 5'
94. **(3)**
95. Which one of the following statements is corrects with respect to AIDS?
 (1) The HIV can be transmitted through eating food together with an infected person
 (2) Drug addicts are least susceptible to HIV infection
 (3) AIDS patients are being fully cured cent percent with proper care and nutrition
 (4) The causative HIV retrovirus enters helper T-lymphocytes thus reducing their number
95. **(4)**
96. Phototropic curvature is the result of uneven distribution of:
 (1) Gibberellin (2) Phytochrome (3) Cytokinins (4) Auxin
96. **(4)**
97. The figure given below is a diagrammatic representation of response of organisms to abiotic factors. What do a, b and c represent respectively?



- | | | |
|-----------------------|-------------------|-------------------|
| (a) | (b) | (c) |
| (1) conformer | regulator | partial regulator |
| (2) regulator | partial regulator | conformer |
| (3) partial regulator | regulator | conformer |
| (4) regulator | conformer | partial regulator |
97. **(4)**
98. Male and female gametophytes are independent and free-living in :
 (1) Mustard (2) Castor (3) Pinus (4) Sphagnum
98. **(3)**

99. The technical term used for the androecium in a flower of China rose (*Hibiscus rosasinensis*) is :
 (1) Monadelphous (2) Diadelphous (3) Polyandrous (4) Polyadelphous
 99. **(1)**
100. Virus envelope is known as :
 (1) Capsid (2) Virion (3) Nucleoprotein (4) Core
 100. **(1)**
101. The permissible use of the technique amniocentesis is for:
 (1) detecting sex of the unborn foetus
 (2) artificial insemination
 (3) transfer of embryo into the uterus of a surrogate mother
 (4) detecting any genetic abnormality
 101. **(4)**
102. During mitosis ER and nucleolus begin to disappear at:
 (1) Late prophase (2) Early metaphase
 (3) Late metaphase (4) Early prophase
 102. **(1)**
103. One of the free-living, anaerobic nitrogen-fixers is :
 (1) *Beijerinckia* (2) *Rhodospirillum*
 (3) *Rhizobium* (4) *Azotobacter*
 103. **(4)**
104. DNA or RNA segment tagged with a radioactive molecule is called:
 (1) Vector (2) Probe (3) Clone (4) Plasmid
 104. **(2)**
105. Darwin's finches are a good example of:
 (1) Industrial melanism (2) Connecting link
 (3) Adaptive radiation (4) Convergent evolution
 105. **(4)**
106. The signals for parturition originate from:
 (1) placenta only
 (2) placenta as well as fully developed foetus
 (3) oxytocin released from maternal pituitary
 (4) fully developed foetus only
 106. **(3)**
107. What is true about RBCs in humans?
 (1) They carry about 20-25 percent of CO_2
 (2) They transport 99.5 percent of O_2
 (3) They transport about 80 percent oxygen only and the rest 20 percent of it is transport in dissolved state in blood plasma
 (4) They do not carry CO_2 at all
 107. **(2)**

108. Which stages of cell division do the following figures *A* and *B* represent respectively?



- | | | |
|-------------------|---|---------------|
| Fig. <i>A</i> | | Fig. <i>B</i> |
| (1) Metaphase | – | Telophase |
| (2) Telophase | – | Metaphase |
| (3) Late Anaphase | – | Prophase |
| (4) Prophase | – | Anaphase |

108. (3)

109. The main arena of various types of activities of a cell is :

- | | |
|---------------------|-------------------|
| (1) Plasma membrane | (2) Mitochondrion |
| (3) Cytoplasm | (4) Nucleus |

109. (3)

110. The common nitrogen-fixer in paddy fields is:

- | | | | |
|----------------------|-------------------------|-------------------------|--------------------|
| (1) <i>Rhizobium</i> | (2) <i>Azospirillum</i> | (3) <i>Oscillatoria</i> | (4) <i>Frankia</i> |
|----------------------|-------------------------|-------------------------|--------------------|

110. (3)

111. The principal nitrogenous excretory compound in human is synthesised:

- | |
|---|
| (1) in kidneys but eliminated mostly through liver |
| (2) in kidneys as well as eliminated by kidneys |
| (3) in liver and also eliminated by the same through bile |
| (4) in the liver, but eliminated mostly through kidneys |

111. (4)

112. Carrier ions like Na^+ facilitate the absorption of substances like:

- | | |
|-----------------------------|-----------------------------------|
| (1) amino acids and glucose | (2) glucose and fatty acids |
| (3) glucose and fatty acids | (4) fructose and some amino acids |

112. (1)

113. Which one of the following symbols and its representation, used in human pedigree analysis is correct?

- | | |
|---------------------------------|------------------------|
| (1) = mating between relatives | (2) = unaffected male |
| (3) = unaffected female | (4) = male affected |

113. (1)

114. Which two of the following changes (a - d) usually tend to occur in the plain dwellers when they move to high altitudes (3, 500 m or more)?

- | | |
|-------------------------------------|---|
| (a) Increase in red blood cell size | (b) Increase in red blood cell production |
| (c) Increased breathing rate | (d) Increase in thrombocyte count |

Changes occurring are:

- | | | | |
|-----------------|-----------------|-----------------|-----------------|
| (1) (b) and (c) | (2) (c) and (d) | (3) (a) and (d) | (4) (a) and (b) |
|-----------------|-----------------|-----------------|-----------------|

114. (1)

115. Toxic agents present in food which interfere with thyroxine synthesis lead to the development of:
 (1) toxic goitre (2) cretinism (3) simple goitre (4) thyrotoxicosis
 115. **(4)**
116. If for some reason our goblet cells are non-functional, this will adversely affect?
 (1) production of somatostatin (2) secretion of sebum from the sebaceous glands
 (3) maturation of sperms (4) smooth movement of food down the intestine
 116. **(4)**
117. The plasma membrane consists mainly of:
 (1) phospholipids embedded in a protein bilayer
 (2) proteins embedded in a phospholipid bilayer
 (3) proteins embedded in a polymer of glucose molecules
 (4) proteins embedded in a carbohydrate bilayer
 117. **(2)**
118. Which of the following statements about all the four of *Spongilla*, Leech, Dolphin and Penguin is correct?
 (1) Penguin is homoiothermic while the remaining three are poikilothermic
 (2) Leech is a fresh water form while all others are marine
 (3) *Spongilla* has special collared cells called choanocytes, not found in the remaining three
 (4) All are bilaterally symmetrical
 118. **(3)**
119. The first movements of the foetus and appearance of hair on its head are usually observed during which month of pregnancy?
 (1) Fourth month (2) Fifth month (3) Sixth month (4) Third month
 119. **(3)**
120. The scutellum observed in a grain of wheat or maize is comparable to which part of the seed in other monocotyledons?
 (1) Cotyledon (2) Endosperm (3) Aleurone layer (4) Plumule
 120. **(1)**
121. Which one of the following kinds of animals are triploblastic?
 (1) Flat worms (2) Sponges (3) Ctenophores (4) Corals
 121. **(1)**
122. Which of the following statements about certain given animals is correct?
 (1) Round worms (Aschelminthes) are pseudocoelomates
 (2) Molluses are acoelomates
 (3) Insects are pseudocoelomates
 (4) Flat worms (Platyhelminthes) are coelomates
 122. **(1)**
123. *Cu* ions released from copper-releasing Intra Uterine Devices (IUDs):
 (1) make uterus unsuitable for implantation (2) increase phagocytosis of sperms
 (3) suppress sperm motility (4) prevent ovulation
 123. **(3)**
124. The energy -releasing metabolic process in which substrate is oxidised without an external electron acceptor is called:
 (1) Glycolysis (2) Fermentation (3) Aerobic respiration (4) Photorespiration
 124. **(4)**

125. Restriction endonucleases are enzymes which
- (1) make cuts at specific positions within the DNA molecule
 - (2) recognize a specific nucleotide sequence for binding of DNA ligase
 - (3) restrict the action of the enzymes DNA polymerase
 - (4) remove nucleotides from the ends of the DNA molecule
125. (1)
126. Which of the following is not a lateral meristem?
- (1) Intrafascicular cambium
 - (2) Interfascicular cambium
 - (3) Phellogen
 - (4) Intercalary meristem
126. (4)
127. A renewable exhaustible natural resource is
- (1) Coal
 - (2) Petroleum
 - (3) Minerals
 - (4) Forest
127. (4)
128. Photoperiodism was first characterised in
- (1) Tobacco
 - (2) Potato
 - (3) Tomato
 - (4) Cotton
128. (1)
129. C_4 plants are more efficient in photosynthesis than C_3 plants due to:
- (1) Higher leaf area
 - (2) Presence of larger number of chloroplasts in the leaf cells
 - (3) Presence of thin cuticle
 - (4) Lower rate of photorespiration
129. (4)
130. Algae have cell wall made up of:
- (1) Cellulose, galactans and mannans
 - (2) Hemicellulose, pectins and proteins
 - (3) Pectins, cellulose and proteins
 - (4) Cellulose, hemicellulose and proteins
130. (4)
131. Some hyperthermophilic organisms that grow in highly acidic (pH2) habitats belong to the two groups:
- (1) Eubacteria and archaea
 - (2) Cyanobacteria and diatoms
 - (3) Protists and mosses
 - (4) Liverworts and yeasts
131. (1)
132. Genetic engineering has been successfully used for producing:
- (1) transgenic mice for testing safety of polio vaccine before use in humans
 - (2) transgenic models for studying new treatments for certain cardiac diseases
 - (3) transgenic Cow-Rosie which produces high fat milk for making ghee
 - (4) animals like bulls for farm work as they have super power
132. (1)
133. Some of the characteristics of Bt cotton are
- (1) Long fibre and resistance to aphids
 - (2) Medium yield, long fibre and resistance to beetle pests
 - (3) High yield and production of toxic protein crystals which kill dipteran pests
 - (4) High yield and resistance to bollworms
133. (4)

134. Heartwood differs from sapwood in
 (1) Presence of rays and fibres (2) Absence of vessels and parenchyma
 (3) Having dead and non-conducting elements (4) Being susceptible to pests and pathogens
134. (3)
135. Satellite DNA is useful tool in:
 (1) Organ transplantation (2) Sex determination
 (3) Forensic science (4) Genetic engineering
135. (3)
136. The second maturation division of the mammalian ovum occurs:
 (1) Shortly after ovulation before the ovum makes entry into the Fallopian tube
 (2) Until after the ovum has been penetrated by sperm
 (3) Until the nucleus of the sperm has fused with that of the ovum
 (4) In the Graafian follicle following the first maturation division
136. (2)
137. Which one of the following does not follow the central dogma of molecular biology
 (1) Pea (2) *Mucor* (3) *Chlamydomonas* (4) HIV
137. (4)
138. Which one of the following statements about human sperm is correct?
 (1) Acrosome has a conical pointed structure used for piercing and penetrating the egg, resulting in fertilisation
 (2) The sperm lysins in the acrosome dissolve the egg envelope facilitating fertilisation
 (3) Acrosome serves as a sensory structure leading the sperm towards the ovum
 (4) Acrosome serves no particular function
138. (2)
139. Consider the following four statements (a - d) regarding kidney transplant and select the two correct ones out of these.
 (a) Even if a kidney transplant is proper the recipient may need to take immuno-suppressants for a long time
 (b) The cell-mediated immune response is responsible for the graft rejection
 (c) The B-lymphocytes are responsible for rejection of the graft
 (d) The acceptance or rejection of a kidney transplant depends on specific interferons
 The two correct statements are
 (1) (b) and (c) (2) (c) and (d) (3) (a) and (c) (4) (a) and (b)
139. (4)
140. Wind pollinated flowers are:
 (1) small, brightly coloured, producing large number of pollen grains
 (2) small, producing large number of dry pollen grains
 (3) large producing abundant nectar and pollen
 (4) small, producing nectar and dry pollen
140. (2)

141. dB is a standard abbreviation used for the quantitative expression of
 (1) the density of bacteria in a medium (2) a particular pollutant
 (3) the dominant *Bacillus* in a culture (4) a certain pesticide
141. (2)
142. Which one of the following is one of the characteristics of a biological community?
 (1) Stratification (2) Natality (3) Mortality (4) Sex-ratio
142. (1)
143. Which one of the following statements about morula in humans is correct?
 (1) It has almost equal quantity of cytoplasm as an uncleaved zygote but much more DNA
 (2) It has far less cytoplasm as well as less DNA than in an uncleaved zygote
 (3) It has more or less equal quantity of cytoplasm and DNA as in uncleaved zygote
 (4) It has more cytoplasm and more DNA than an uncleaved zygote
143. (3)
144. Coiling of garden pea tendrils around any support is an example of:
 (1) Thigmotaxis (2) Thigmonasty (3) Thigmotropism (4) Thermotaxis
144. (3)
145. The two gases making highest relative contribution to the greenhouse gases are:
 (1) CO_2 and CH_4 (2) CH_4 and N_2O (3) CFC_5 and N_2O (4) CO_3 and N_2O
145. (1)
146. Which one of the following is not used in organic farming?
 (1) *Glomus* (2) Earthworm (3) *Oscillatoria* (4) Snail
146. (4)
147. Stirred-tank bioreactors have been designed for:
 (1) Addition of preservatives to the product
 (2) Purification of the product
 (3) Ensuring anaerobic conditions in the culture vessel
 (4) Availability of oxygen throughout the process
147. (4)
148. The part of Fallopian tube closest to the ovary is:
 (1) Isthmus (2) Infundibulum (3) Cervix (4) Ampulla
148. (2)
149. An improved variety of transgenic basmati rice:
 (1) does not require chemical fertilizers and growth hormones
 (2) gives high yield and is rich in vitamin A
 (3) is completely resistant to all insect pests and diseases of paddy
 (4) gives high yield but has no characteristic aroma
149. (2)
150. Infectious proteins are present in:
 (1) Geminiviruses (2) Prions (3) Viroids (4) Satellite viruses
150. (2)