

AIPMT 2008 Prelims — Biology Question Paper with Solutions

95 Biology questions as set in the paper · answers checked by RankUp

AIPMT 2008 Prelims · Q101

1. Select one of the following of important features distinguishing Gnetum from Cycas and Pinus and showing affinities with angiosperms

- (A) Embryo development and apical meristem
- (B) Absence of resin duct and leaf venation
- (C) Presence of vessel elements and absence of archegonia
- (D) Perianth and two integuments

AIPMT 2008 Prelims · Q102

2. Thermococcus, Methanococcus and Methanobacterium exemplify

- (A) Bacteria that contain a cytoskeleton and ribosomes
- (B) Archaeobacteria that contain protein homologous to eukaryotic core histones
- (C) Archaeobacteria that lack any histones resembling those found in eukaryotes but whose DNA is negatively supercoiled
- (D) Bacteria whose DNA is relaxed or positively supercoiled but which have a cytoskeleton as well as mitochondria

AIPMT 2008 Prelims · Q103

3. Which one of the following is heterosporous?

- (A) Equisetum
- (B) Dryopteris
- (C) Salvinia
- (D) Adiantum

AIPMT 2008 Prelims · Q104

4. In which one of the following male and female gametophytes do not have free living independent existence?

- (A) Cedrus
- (B) Pteris
- (C) Funaria
- (D) Polytrichum

AIPMT 2008 Prelims · Q105

5. Which one of the following groups of three animals each is correctly matched with their one characteristic morphological feature?

Animals - Morphological feature

- (A) Cockroach, Locust, Taenia - Metameric segmentation
- (B) Liver fluke, Sea anemone, Sea cucumber - Bilateral symmetry
- (C) Centipede, Prawn, Sea urchin - Jointed appendages
- (D) Scorpion, Spider, Cockroach - Ventral solid central nervous system

AIPMT 2008 Prelims · Q106

6. Which one of the following phyla is correctly matched with its two general characteristics?

- (A) Mollusca - Normally oviparous and development through a trochophore or veliger larva
- (B) Arthropoda - Body divided into head, thorax and abdomen and respiration by tracheae
- (C) Chordata - Notochord at some stage and separate anal and urinary openings to the outside
- (D) Echinodermata - Pentamerous radial symmetry and mostly internal fertilization

AIPMT 2008 Prelims · Q107

7. Which one of the following in birds, indicates their reptilian ancestry?

- (A) Eggs with a calcareous shell
- (B) Scales on their hind limbs
- (C) Four-chambered heart
- (D) Two special chambers crop and gizzard in their digestive tract

AIPMT 2008 Prelims · Q108

8. Ascaris is characterized by

- (A) Presence of true coelom and metamerism (metamerisation)
- (B) Absence of true coelom but presence of metamerism
- (C) Presence of neither true coelom nor metamerism
- (D) Presence of true coelom but absence of metamerism

AIPMT 2008 Prelims · Q109

9. Which one of the following is not a characteristic of phylum Annelida?

- (A) Ventral nerve cord
- (B) Closed circulatory system
- (C) Segmentation
- (D) Pseudocoelom

AIPMT 2008 Prelims · Q110

10. Cellulose is the major component of cell walls of

- (A) Saccharomyces
- (B) Pythium
- (C) Xanthomonas
- (D) Pseudomonas

AIPMT 2008 Prelims · Q111

11. Vacuole in a plant cell

- (A) Lacks membrane and contains water and excretory substances
- (B) Is membrane-bound and contains storage proteins and lipids
- (C) Is membrane-bound and contains water and excretory substances
- (D) Lacks membrane and contains air

AIPMT 2008 Prelims · Q112

12. A competitive inhibitor of succinic dehydrogenase is

- (A) Malate
- (B) Malonate
- (C) Oxaloacetate
- (D) α -ketoglutarate

AIPMT 2008 Prelims · Q113

13. Polysome is formed by

- (A) Ribosomes attached to each other in a linear arrangement
- (B) Several ribosomes attached to a single mRNA
- (C) Many ribosomes attached to a strand of endoplasmic reticulum
- (D) A ribosome with several subunits

AIPMT 2008 Prelims · Q114

14. Carbohydrates are commonly found as starch in plant storage organs. Which of the following five properties of starch (a - e) make it useful as a storage material?

- a. Easily translocated**
- b. Chemically non-reactive**
- c. Easily digested by animals**
- d. Osmotically inactive**
- e. Synthesized during photosynthesis**

The useful properties are

- (A) Both a & e
- (B) Both b & c
- (C) Both b & d
- (D) a, c & e

AIPMT 2008 Prelims · Q115

15. In the light of recent classification of living organisms into three domains of life (bacteria, archaea and eukarya), which one of the following statements is true about archaea?

- (A) Archaea completely differ from prokaryotes
- (B) Archaea resemble eukarya in all respects
- (C) Archaea have some novel features that are absent in other prokaryotes and eukaryotes
- (D) Archaea completely differ from both prokaryotes and eukaryotes

AIPMT 2008 Prelims · Q116

16. Keeping in view the 'fluid mosaic model' for the structure of cell membrane, which one of the following statements is correct w.r.t. the movement of lipids and proteins from one lipid monolayer to the other (described as flip-flop movement)?

- (A) Neither lipids nor proteins can flip-flop
- (B) Both lipids and proteins can flip-flop
- (C) While lipids can rarely flip-flop, proteins cannot
- (D) While proteins can flip-flop, lipids cannot

AIPMT 2008 Prelims · Q117

17. In germinating seeds fatty acids are degraded exclusively in the

- (A) Mitochondria
- (B) Proplastids
- (C) Glyoxysomes
- (D) Peroxisomes

AIPMT 2008 Prelims · Q118

18. The two sub-units of ribosome remain united at a critical ion level of

- (A) Calcium
- (B) Copper
- (C) Manganese
- (D) Magnesium

AIPMT 2008 Prelims · Q119

19. Thorn of Bougainvillea and tendril of Cucurbita are example of

- (A) Retrogressive evolution
- (B) Analogous organs
- (C) Homologous organs
- (D) Vestigial organs

20. Haploids are more suitable for mutation studies than the diploids. This is because

- (A) All mutations, whether dominant or recessive are expressed in haploids
- (B) Haploids are reproductively more stable than diploids
- (C) Mutagens penetrate in haploids more effectively than diploids
- (D) Haploids are more abundant in nature than diploids

21. Which one of the following pairs of nitrogenous bases of nucleic acids, is wrongly matched with the category mentioned against it?

- (A) Adenine, Thymine - Purines
- (B) Thymine, Uracil - Pyrimidines
- (C) Uracil, Cytosine - Pyrimidines
- (D) Guanine, Adenine - Purines

22. Which one of the following conditions in humans is correctly matched with its chromosomal abnormality/ linkage?

- (A) Down syndrome - 44 autosomes + XO
- (B) Klinefelter syndrome - 44 autosomes + XXY
- (C) Colour blindness - Y-linked
- (D) Erythroblastosis foetalis - X-linked

23. In the DNA molecules

- (A) There are two strands which run antiparallel-one in 5'→3' direction and other in 3'→5'
- (B) The total amount of purine nucleotides and pyrimidine nucleotides is not always equal
- (C) There are two strands which run parallel in the 5'→3' direction
- (D) The proportion of Adenine in relation to thymine varies with the organism

24. What is true about the isolated small tribal populations?

- (A) There is no change in population size as they have a large gene pool
- (B) There is a decline in population as boys marry girls only from their own tribe
- (C) Hereditary diseases like colour blindness do not spread in the isolated population
- (D) Wrestlers who develop strong body muscles in their life time pass this character on to their progeny

25. Which one of the following scientist's name is correctly matched with the theory put forth by him?

- (A) Mendel - Theory of Pangenesis
- (B) Weismann - Theory of continuity of Germplasm
- (C) Pasteur - Inheritance of acquired characters
- (D) de Vries - Natural selection

26. Which one of the following is incorrect about the characteristics of protobionts (coacervates and microspheres) as envisaged in the abiogenic origin of life?

- (A) They could maintain an internal environment
- (B) They were able to reproduce
- (C) They could separate combinations of molecules from the surroundings
- (D) They were partially isolated from the surroundings

AIPMT 2008 Prelims · Q127

27. Darwin's Finches are an excellent example of

- (A) Connecting links
- (B) Adaptive radiation
- (C) Seasonal migration
- (D) Brood parasitism

AIPMT 2008 Prelims · Q128

28. Which one of the following pairs of items correctly belongs to the category of organs mentioned against it?

- (A) Wings of honey-bee and wings of crow - Homologous organs
- (B) Thorn of Bougainvillea and tendrils of Cucurbita - Analogous organs
- (C) Nictitating membrane and blind spot in human eye - Vestigial organs
- (D) Nephridia of earthworm and malpighian tubules of cockroach - Excretory organs

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29. The fruit is chambered, developed from inferior ovary and has seeds with succulent testa in

- (A) Cucumber
- (B) Pomegranate
- (C) Orange
- (D) Guava

AIPMT 2008 Prelims · Q130

30. The C_4 plants are photosynthetically more efficient than C_3 plants because

- (A) They have more chloroplasts
- (B) The CO_2 compensation point is more
- (C) CO_2 generated during photorespiration is trapped and recycled through PEP carboxylase
- (D) The CO_2 efflux is not prevented

AIPMT 2008 Prelims · Q131

31. The chemiosmotic coupling hypothesis of oxidative phosphorylation proposes that adenosine triphosphate (ATP) is formed because

- (A) There is a change in the permeability of the inner mitochondrial membrane toward adenosine diphosphate (ADP)
- (B) High energy bonds are formed in mitochondrial proteins
- (C) ADP is pumped out of the matrix into the intermembrane space
- (D) A proton gradient forms across the inner membrane

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32. Dry indehiscent single-seeded fruit formed from bicarpellary syncarpous inferior ovary is

- (A) Cremocarp
- (B) Caryopsis
- (C) Cypsela
- (D) Berry

AIPMT 2008 Prelims · Q133

33. The rupture and fractionation do not usually occur in the water column in vessel/tracheids during the ascent of sap because of

- (A) Transpiration pull
- (B) Lignified thick walls
- (C) Cohesion and adhesion
- (D) Weak gravitational pull

AIPMT 2008 Prelims · Q135

34. Vascular tissues in flowering plants develop from

- (A) Dermatogen
- (B) Phellogen
- (C) Plerome
- (D) Periblem

AIPMT 2008 Prelims · Q136

35. In leaves of C₄ plants malic acid synthesis during CO₂ fixation occurs in

- (A) Guard cells
- (B) Epidermal cells
- (C) Mesophyll cells
- (D) Bundle sheath

AIPMT 2008 Prelims · Q137

36. Importance of day length in flowering of plants was first shown in

- (A) Petunia
- (B) Lemna
- (C) Tobacco
- (D) Cotton

AIPMT 2008 Prelims · Q138

37. Endosperm is consumed by developing embryo in the seed of

- (A) Maize
- (B) Coconut
- (C) Castor
- (D) Pea

AIPMT 2008 Prelims · Q139

38. Nitrogen fixation in root nodules of *Alnus* is brought about by

- (A) Azorhizobium
- (B) Bradyrhizobium
- (C) Clostridium
- (D) Frankia

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39. The energy releasing process in which the substrate is oxidised without an external electron acceptor is called

- (A) Glycolysis
- (B) Fermentation
- (C) Photorespiration
- (D) Aerobic respiration

AIPMT 2008 Prelims · Q141

40. Replum is present in the ovary of flower of

- (A) Pea
- (B) Lemon
- (C) Mustard
- (D) Sunflower

AIPMT 2008 Prelims · Q142

41. The fleshy receptacle of syconus of fig encloses a number of

- (A) Mericarps
- (B) Achenes
- (C) Samaras
- (D) Berries

42. Electrons from excited chlorophyll molecule of photosystem II are accepted first by

- (A) Ferredoxin
- (B) Cytochrome - b
- (C) Cytochrome - f
- (D) Quinone

43. Which type of white blood cells are concerned with the release of histamine and the natural anticoagulant heparin?

- (A) Monocytes
- (B) Neutrophils
- (C) Basophils
- (D) Eosinophils

44. Which one of the following is the true description about an animal concerned?

- (A) Cockroach - 10 pairs of spiracles (2 pairs on thorax and 8 pairs on abdomen)
- (B) Earthworm - The alimentary canal consists of a sequence of pharynx, oesophagus, stomach, gizzard and intestine
- (C) Frog - Body divisible into three regions - head, neck and trunk
- (D) Rat - Left kidney is slightly higher in position than the right one

45. Which one of the following is the correct matching of the site of action on the given substrate, the enzyme acting upon it and the end product?

- (A) Stomach : Fats --(Lipase)→ micelles
- (B) Duodenum : Triglycerides --(Trypsin)→ monoglycerides
- (C) Small intestine : Starch --(α -Amylase)→ Disaccharide (Maltose)
- (D) Small intestine : Proteins --(Pepsin)→ Amino acids

46. What is vital capacity of our lungs?

- (A) Total lungs capacity minus residual volume
- (B) Inspiratory reserve volume plus tidal volume
- (C) Total lungs capacity minus expiratory reserve volume
- (D) Inspiratory reserve volume plus expiratory reserve volume

47. Which one of the following is the correct difference between Rod Cells and Cone Cells of our retina?

(Feature : Rod Cells | Cone Cells)

- (A) Distribution : More concentrated in centre of retina | Evenly distributed all over retina
- (B) Visual acuity : High | Low
- (C) Visual pigment contained : Iodopsin | Rhodopsin
- (D) Overall function : Vision in poor light | Colour vision and detailed vision in bright light

48. Which one of the following items gives its correct total number?

- (A) Cervical vertebrae in humans - 8
- (B) Floating ribs in humans - 4
- (C) Amino acids found in proteins - 16
- (D) Types of diabetes - 3

49. Given below are four methods (i - iv) and their modes of action (a - d) in achieving contraception. Select their correct matching from the four options that follow

Method: (i) The pill (ii) Condom (iii) Vasectomy (iv) Copper T

Mode of Action: (a) Prevents sperms reaching cervix (b) Prevents implantation (c) Prevents ovulation (d) Semen contains no sperms

- (A) (i)-(b), (ii)-(c), (iii)-(a), (iv)-(d)
- (B) (i)-(c), (ii)-(a), (iii)-(d), (iv)-(b)
- (C) (i)-(d), (ii)-(a), (iii)-(b), (iv)-(c)
- (D) (i)-(c), (ii)-(d), (iii)-(a), (iv)-(b)

50. What will happen if the secretion of parietal cells of gastric glands is blocked with an inhibitor?

- (A) Enterokinase will not be released from the duodenal mucosa and so trypsinogen is not converted to trypsin
- (B) Gastric juice will be deficient in chymosin
- (C) Gastric juice will be deficient in pepsinogen
- (D) In the absence of HCl secretion, inactive pepsinogen is not converted into the active enzyme pepsin

51. During the propagation of a nerve impulse, the action potential results from the movement of

- (A) Na^+ ions from extracellular fluid to intracellular fluid
- (B) K^+ ions from extracellular fluid to intracellular fluid
- (C) Na^+ ions from intracellular fluid to extracellular fluid
- (D) K^+ ions from intracellular fluid to extracellular fluid

52. The blood calcium level is lowered by the deficiency of

- (A) Calcitonin
- (B) Parathormone
- (C) Thyroxine
- (D) Both Calcitonin and Parathormone

53. The most active phagocytic white blood cells are

- (A) Neutrophils and monocytes
- (B) Neutrophils and eosinophils
- (C) Lymphocytes and macrophages
- (D) Eosinophils and lymphocytes

54. Earthworms have no skeleton but during burrowing, the anterior end becomes turgid and acts as a hydraulic skeleton. It is due to

- (A) Setae
- (B) Coelomic fluid
- (C) Blood
- (D) Gut peristalsis

55. In humans, blood passes from the post caval to the diastolic right atrium of heart due to

- (A) Pressure difference between the post caval and atrium
- (B) Pushing open of the venous valves
- (C) Suction pull
- (D) Stimulation of the sino auricular node

56. In humans, at the end of the first meiotic division, the male germ cells differentiate into the

- (A) Spermatogonia
- (B) Primary spermatocytes
- (C) Secondary spermatocytes
- (D) Spermatids

57. Which one of the following is resistant to enzyme action?

- (A) Leaf cuticle
- (B) Cork
- (C) Wood fibre
- (D) Pollen exine

58. The length of different internodes in a culm of sugarcane is variable because of

- (A) Intercalary meristem
- (B) Shoot apical meristem
- (C) Position of axillary buds
- (D) Size of leaf lamina at the node below each internode

59. Which one of the following pairs of plant structures has haploid number of chromosomes?

- (A) Egg nucleus and secondary nucleus
- (B) Megaspore mother cell and antipodal cells
- (C) Egg cell and antipodal cells
- (D) Nucellus and antipodal cells

60. What does the filiform apparatus do at the entrance into ovule?

- (A) It guides pollen tube from a synergid to egg
- (B) It helps in the entry of pollen tube into a synergid
- (C) It prevents entry of more than one pollen tube into the embryo sac
- (D) It brings about opening of the pollen tube

61. Unisexuality of flowers prevents

- (A) Autogamy and geitonogamy
- (B) Autogamy, but not geitonogamy
- (C) Both geitonogamy and xenogamy
- (D) Geitonogamy, but not xenogamy

62. Which extraembryonic membrane in humans prevents desiccation of the embryo inside the uterus?

- (A) Amnion
- (B) Chorion
- (C) Allantois
- (D) Yolk sac

63. Which one of the following statements is incorrect about menstruation?

- (A) The beginning of the cycle of menstruation is called menarche
- (B) During normal menstruation about 40 ml blood is lost
- (C) The menstrual fluid can easily clot
- (D) At menopause in the female, there is especially abrupt increase in gonadotropic hormones

64. The haemoglobin of a human foetus

- (A) Has a higher affinity for oxygen than that of an adult
- (B) Has a lower affinity for oxygen than that of the adult
- (C) Its affinity for oxygen is the same as that of an adult
- (D) Has only 2 protein subunits instead of 4

65. Consider the statements given below regarding contraception and answer as directed thereafter

- (a) Medical Termination of Pregnancy (MTP) during first trimester is generally safe**
- (b) Generally chances of conception are nil until mother breast-feeds the infant upto two years**
- (c) Intrauterine devices like copper-T are effective contraceptives**
- (d) Contraception pills may be taken upto one week after coitus to prevent conception**

Which two of the above statements are correct?

- (A) a, b
- (B) b, c
- (C) c, d
- (D) a, c

66. In human adult females oxytocin

- (A) Causes strong uterine contractions during parturition
- (B) Is secreted by anterior pituitary
- (C) Stimulates growth of mammary glands
- (D) Stimulates pituitary to secrete vasopressin

67. Which one of the following is the correct percentage of the two (out of the total of 4) green house gases that contribute to the total global warming?

- (A) Methane 20%, N₂O 18%
- (B) CFCs 14%, Methane 20%
- (C) CO₂ 40%, CFCs 30%
- (D) N₂O 6%, CO₂ 86%

68. Quercus species are the dominant component in

- (A) Tropical rain forests
- (B) Temperate deciduous forests
- (C) Alpine forests
- (D) Scrub forests

69. About 70% of total global carbon is found in

- (A) Forests
- (B) Grasslands
- (C) Agroecosystems
- (D) Oceans

70. Which one of the following is not observed in biodiversity hotspots?

- (A) Species richness
- (B) Endemism
- (C) Accelerated species loss
- (D) Lesser inter-specific competition

71. World summit on Sustainable Development (2002) was held in

- (A) South Africa
- (B) Brazil
- (C) Sweden
- (D) Argentina

72. Consider the following statements concerning food chains

- (a) Removal of 80% tigers from an area resulted in greatly increased growth of vegetation**
- (b) Removal of most of the carnivores resulted in an increased population of deers**
- (c) The length of food chains is generally limited to 3-4 trophic levels due to energy loss**
- (d) The length of food chains may vary from 2 to 8 trophic levels.**

Which two of the above statements are correct?

- (A) a, b
- (B) b, c
- (C) c, d
- (D) a, d

73. According to Central Pollution Control Board (CPCB), which particulate size in diameter (in micrometers) of the air pollutants is responsible for greatest harm to human health?

- (A) 5.2 - 2.5
- (B) 2.5 or less
- (C) 1.5 or less
- (D) 1.0 or less

74. A lake near a village suffered heavy mortality of fishes within a few days. Consider the following reasons for this

- (a) Lots of urea and phosphate fertilizer were used in the crops in the vicinity**
- (b) The area was sprayed with DDT by an aircraft**
- (c) The lake water turned green and stinky**
- (d) Phytoplankton populations in the lake declined initially thereby greatly reducing photosynthesis**

Which two of the above were the main causes of fish mortality in the lake?

- (A) a, b
- (B) b, c
- (C) c, d
- (D) a, c

75. Consider the following four statements (a - d) about certain desert animals such as kangaroo rat.

- (a) They have dark colour and high rate of reproduction and excrete solid urine
- (b) They do not drink water, breathe at a slow rate to conserve water and have their body covered with thick hairs
- (c) They feed on dry seeds and do not require drinking water
- (d) They excrete very concentrated urine and do not use water to regulate body temperature

Which two of the above statements for such animals are true?

- (A) a and b
- (B) c and d
- (C) b and c
- (D) c and a

76. A transgenic food crop which may help in solving the problem of night blindness in developing countries is

- (A) Golden rice
- (B) Flavr Savr tomatoes
- (C) Starlink maize
- (D) Bt Soybean

77. Bacterial leaf blight of rice is caused by a species of

- (A) Erwinia
- (B) Xanthomonas
- (C) Pseudomonas
- (D) Alternaria

78. Which one of the following is linked to the discovery of Bordeaux mixture as a popular fungicide?

- (A) Black rust of wheat
- (B) Bacterial leaf blight of rice
- (C) Downy mildew of grapes
- (D) Loose smut of wheat

79. Which one of the following is being tried in India as a biofuel substitute for fossil fuels?

- (A) Aegilops
- (B) Jatropha
- (C) Azadirachta
- (D) Musa

80. Trichoderma harzianum has proved a useful microorganism for

- (A) Biological control of soil-borne plant pathogens
- (B) Bioremediation of contaminated soils
- (C) Reclamation of wastelands
- (D) Gene transfer in higher plants

81. Gel electrophoresis is used for

- (A) Isolation of DNA molecule
- (B) Cutting of DNA into fragments
- (C) Separation of DNA fragments according to their size
- (D) Construction of recombinant DNA by joining with cloning vectors

82. To which type of barriers under innate immunity, do the saliva in the mouth and the tears from the eyes, belong?

- (A) Physical barriers
- (B) Cytokine barriers
- (C) Cellular barriers
- (D) Physiological barriers

83. Match the disease in Column I with the appropriate items (pathogen/prevention/treatment) in Column II

Column I: (a) Amoebiasis (b) Diphtheria (c) Cholera (d) Syphilis

Column II: (i) Treponema pallidum (ii) Use only sterilized food and water (iii) DPT Vaccine (iv) Use oral rehydration therapy

- (A) a-(ii), b-(iii), c-(iv), d-(i)
- (B) a-(i), b-(ii), c-(iii), d-(iv)
- (C) a-(ii), b-(iv), c-(i), d-(iii)
- (D) a-(ii), b-(i), c-(iii), d-(iv)

84. Consider the following statements about biomedical technologies

- (a) During open heart surgery blood is circulated in the heart-lung machine**
- (b) Blockage in coronary arteries is removed by angiography**
- (c) Computerised Axial Tomography (CAT) shows detailed internal structure as seen in a section of body**
- (d) X-ray provides clear and detailed images of organs like prostate glands and lungs**

Which two of the above statements are correct?

- (A) a and b
- (B) b and d
- (C) c and d
- (D) a and c

85. Which one of the following pairs of codons is correctly matched with their function or the signal for the particular amino acid?

- (A) UUA, UCA - Leucine
- (B) GUU, GCU - Alanine
- (C) UAG, UGA - Stop
- (D) AUG, ACG - Start / Methionine

86. Cry 1 endotoxins obtained from Bacillus thuringiensis are effective against

- (A) Boll worms
- (B) Mosquitoes
- (C) Flies
- (D) Nematodes

AIPMT 2008 Prelims · Q192

87. Modern detergents contain enzyme preparations of

- (A) Thermophiles
- (B) Acidophiles
- (C) Alkaliphiles
- (D) Thermoacidophiles

AIPMT 2008 Prelims · Q193

88. The linking of antibiotic resistance gene with the plasmid vector became possible with

- (A) Exonucleases
- (B) DNA ligase
- (C) Endonucleases
- (D) DNA polymerase

AIPMT 2008 Prelims · Q194

89. Which one of the following proved effective for biological control of nematodal disease in plants?

- (A) *Paecilomyces lilacinus*
- (B) *Pisolithus tinctorius*
- (C) *Pseudomonas cepacia*
- (D) *Gliocladium virens*

AIPMT 2008 Prelims · Q195

90. Main objective of production/use of herbicide resistant GM crops is to

- (A) Reduce herbicide accumulation in food articles for health safety
- (B) Eliminate weeds from the field without the use of manual labour
- (C) Eliminate weeds from the field without the use of herbicides
- (D) Encourage eco-friendly herbicides

AIPMT 2008 Prelims · Q196

91. Consider the following four measures (a - d) that could be taken to successfully grow chick-pea in an area where bacterial blight disease is common

- (a) Spray with Bordeaux mixture**
- (b) Control of the insect vector of the disease pathogen**
- (c) Use of only disease-free seeds**
- (d) Use of varieties resistant to the disease**

Which two of the above measures can control the disease?

- (A) (a) and (d)
- (B) (b) and (c)
- (C) (a) and (b)
- (D) (c) and (d)

AIPMT 2008 Prelims · Q197

92. Human insulin is being commercially produced from a transgenic species of

- (A) *Saccharomyces*
- (B) *Escherichia*
- (C) *Mycobacterium*
- (D) *Rhizobium*

AIPMT 2008 Prelims · Q198

93. Cornea transplant in humans is almost never rejected. This is because

- (A) It is a non-living layer
- (B) Its cells are least penetrable by bacteria
- (C) It has no blood supply
- (D) It is composed of enucleated cells

94. Which of the following pairs of organs includes only the endocrine glands?

- (A) Adrenal and Ovary
- (B) Parathyroid and Adrenal
- (C) Pancreas and Parathyroid
- (D) Thymus and Testes

95. What is antisense technology?

- (A) RNA polymerase producing DNA
- (B) A cell displaying a foreign antigen used for synthesis of antigens
- (C) Production of somaclonal variants in tissue cultures
- (D) When a piece of RNA that is complementary in sequence is used to stop expression of a specific gene

Answer key and explanations

1. Answer: (C) Presence of vessel elements and absence of archegonia

Gnetum stands apart from Cycas and Pinus because its xylem contains true vessels and its female gametophyte has no archegonia, two features otherwise typical of flowering plants. Apical meristems and embryo development are common to all seed plants, so they do not separate Gnetum from the other gymnosperms.

2. Answer: (B) Archaeobacteria that contain protein homologous to eukaryotic core histones

These genera are methanogenic and hyperthermophilic archaeobacteria, and many euryarchaea such as these carry small histone proteins clearly homologous to the eukaryotic core histones (H3/H4 fold) that wrap their DNA. The statement that they lack any eukaryote-like histones is therefore wrong; hyperthermophiles like Thermococcus also tend to have relaxed or positively supercoiled DNA owing to reverse gyrase.

3. Answer: (C) Salvinia

Salvinia, a water fern, produces two kinds of spores (microspores and megaspores), as NCERT notes for Selaginella and Salvinia. Equisetum, Dryopteris and Adiantum all produce a single kind of spore and are homosporous.

4. Answer: (A) Cedrus

Cedrus is a gymnosperm, in which the male gametophyte (pollen) and female gametophyte (inside the ovule) are highly reduced and remain dependent on the sporophyte. In Pteris the prothallus is free-living, and in the mosses Funaria and Polytrichum the gametophyte is the dominant independent plant.

5. Answer: (D) Scorpion, Spider, Cockroach - Ventral solid central nervous system

Scorpion, spider and cockroach are all arthropods, and non-chordates like these have a ventral, solid nerve cord. Taenia is not metamerically segmented, sea anemone is radially symmetrical, and sea urchin (an echinoderm) has no jointed appendages, so the other groupings each contain a misfit.

6. Answer: (A) Mollusca - Normally oviparous and development through a trochophore or veliger larva

Molluscs are usually oviparous with indirect development, typically via trochophore and veliger larvae. Arthropods breathe by gills, book lungs or tracheae and are not all divided into head, thorax and abdomen; echinoderms have external fertilisation; and many chordates have a common cloacal opening.

7. Answer: (B) Scales on their hind limbs

NCERT notes that the hind limbs of birds generally bear scales, a retained reptilian character. A four-chambered heart is a feature birds share with mammals rather than with reptiles (which mostly have three chambers), so it does not indicate reptilian ancestry.

8. Answer: (C) Presence of neither true coelom nor metamerism

Ascaris is an aschelminth (roundworm): it is pseudocoelomate and its body is not segmented. True coelom together with metamerism is the annelid condition, not that of nematodes.

9. Answer: (D) Pseudocoelom

Annelids are true coelomates (schizocoelous); a pseudocoelom is the feature of Aschelminthes. Annelids do have a ventral nerve cord, closed circulation and metameric segmentation.

10. Answer: (B) Pythium

Pythium is an oomycete (traditionally a phycomycete) whose wall is made mainly of cellulose. Saccharomyces, a true fungus, has a chitin/glucan wall, while Xanthomonas and Pseudomonas are bacteria with peptidoglycan walls.

11. Answer: (C) Is membrane-bound and contains water and excretory substances

The plant vacuole is bounded by a single membrane, the tonoplast, and holds water, sap, excretory products and other materials not useful to the cell. Lipids are stored in oil bodies, not the vacuole, and the vacuole is not membrane-less.

12. Answer: (B) Malonate

Malonate closely resembles succinate in structure, so it binds the active site of succinic dehydrogenase and competes with the substrate, the NCERT example of competitive inhibition. Malate and oxaloacetate are downstream Krebs cycle intermediates, not the classic inhibitor.

13. Answer: (B) Several ribosomes attached to a single mRNA

A polysome (polyribosome) is a chain of several ribosomes translating the same mRNA at the same time. The ribosomes are linked through the mRNA, not directly to one another, and ribosomes bound to ER form rough ER rather than a polysome.

14. Answer: (C) Both b & d

Starch is a large, insoluble polymer, so it is chemically unreactive and exerts no osmotic effect, letting cells store a lot of it without drawing in water. It is not easily translocated (sugars like sucrose are), and being digestible by animals is irrelevant to the plant's storage needs.

15. Answer: (C) Archaea have some novel features that are absent in other prokaryotes and eukaryotes

Archaea are prokaryotes that share some traits with bacteria and some with eukaryotes, and also have unique features such as ether-linked membrane lipids and distinctive cell walls. They neither completely differ from nor fully resemble the other groups, which rules out the absolute options.

16. Answer: (C) While lipids can rarely flip-flop, proteins cannot

Membrane lipids occasionally move from one leaflet to the other (transverse diffusion), though this is slow and rare. Proteins, with their large hydrophilic domains, cannot cross the hydrophobic core, so they move only laterally.

17. Answer: (C) Glyoxysomes

In fat-storing germinating seeds, beta-oxidation of fatty acids and the glyoxylate cycle take place in glyoxysomes, specialised microbodies that convert fat to sugar. In plants mitochondria do not carry out fatty acid beta-oxidation for this purpose.

18. Answer: (D) Magnesium

Mg²⁺ ions hold the large and small ribosomal subunits together; when Mg²⁺ falls below a critical level the subunits dissociate. Calcium, copper and manganese do not play this role.

19. Answer: (C) Homologous organs

Both the thorn of Bougainvillea and the tendril of Cucurbita are modified axillary branches (stem origin) that now do different jobs, which makes them homologous, the NCERT example of divergent evolution. Analogous organs would share function but differ in origin.

20. Answer: (A) All mutations, whether dominant or recessive are expressed in haploids

A haploid has only one copy of each gene, so a recessive mutation cannot be masked by a dominant allele and shows up directly in the phenotype. Mutagen penetration does not depend on ploidy, so that option gives a wrong reason.

21. Answer: (A) Adenine, Thymine - Purines

Adenine is a purine but thymine is a pyrimidine, so grouping them together as purines is wrong. Adenine and guanine are purines, and cytosine, thymine and uracil are pyrimidines, so the other pairs are correct.

22. Answer: (B) Klinefelter syndrome - 44 autosomes + XXY

Klinefelter syndrome results from an extra X chromosome in a male, giving 44 autosomes + XXY (47 chromosomes). Down syndrome is trisomy 21 (44 + XO is Turner syndrome), colour blindness is X-linked, and erythroblastosis foetalis comes from Rh incompatibility, not sex linkage.

23. Answer: (A) There are two strands which run antiparallel-one in 5'→3' direction and other in 3'→5'

The two polynucleotide chains of the double helix run antiparallel, one 5'→3' and the other 3'→5'. By Chargaff's rule, purines always equal pyrimidines and A always equals T in double-stranded DNA, so those options are false.

24. Answer: (B) There is a decline in population as boys marry girls only from their own tribe

A small isolated tribe has a small gene pool and no gene flow, so marriage within the tribe leads to inbreeding depression and can contribute to population decline. Inbreeding actually helps recessive hereditary disorders like colour blindness spread, and acquired traits such as a wrestler's muscles are not inherited.

25. Answer: (B) Weismann - Theory of continuity of Germplasm

August Weismann proposed the continuity of germplasm, holding that only changes in germ cells are inherited. Pangenesis was Darwin's idea, inheritance of acquired characters was Lamarck's, and de Vries gave the mutation theory.

26. Answer: (B) They were able to reproduce

Protobionts such as coacervates and microspheres were membrane-bounded droplets that kept an internal environment partly separate from their surroundings, but they lacked genetic material and so could not truly reproduce. Maintaining an internal environment is a correct property, not the incorrect one.

27. Answer: (B) Adaptive radiation

From a seed-eating ancestor, Galapagos finches diversified into many species with different beaks suited to different diets, which NCERT presents as the classic case of adaptive radiation. They are not intermediates between two groups, so 'connecting links' does not apply.

28. Answer: (D) Nephridia of earthworm and malpighian tubules of cockroach - Excretory organs

Nephridia in earthworm and Malpighian tubules in cockroach are both excretory organs. Wings of bee and crow are analogous (not homologous), thorn and tendril are homologous (not analogous), and the blind spot is just where the optic nerve leaves the eye, not a vestigial organ.

29. Answer: (B) Pomegranate

Pomegranate (balausta) develops from an inferior ovary, is divided into chambers, and its edible part is the juicy outer seed coat (testa). In orange the edible part is juicy hairs from the endocarp, and orange develops from a superior ovary.

30. Answer: (C) CO₂ generated during photorespiration is trapped and recycled through PEP carboxylase

C₄ plants use PEP carboxylase in mesophyll cells to capture CO₂ and concentrate it in bundle sheath cells, so RuBisCO works near saturation and photorespiration is minimal; any CO₂ that leaks out can be refixed by PEP carboxylase. Their efficiency comes from this CO₂-concentrating mechanism, not from simply having more chloroplasts, and their CO₂ compensation point is lower, not higher.

31. Answer: (D) A proton gradient forms across the inner membrane

According to the chemiosmotic hypothesis, the electron transport chain pumps protons into the intermembrane space, building a proton gradient across the inner mitochondrial membrane. Protons flowing back through F₀-F₁ ATP synthase drive ATP formation; high-energy protein intermediates were part of an older, rejected hypothesis.

32. Answer: (C) Cypsela

A cypsela, as in sunflower and other Asteraceae, is a dry, one-seeded indehiscent fruit from a bicarpellary, syncarpous, inferior ovary. A cremocarp splits into two mericarps, and a caryopsis comes from a monocarpellary superior ovary.

33. Answer: (C) Cohesion and adhesion

Water molecules cohere strongly to one another and adhere to the walls of the xylem conduits, so the column under tension stays continuous instead of breaking. Transpiration pull creates the tension but does not by itself stop the column from breaking.

34. Answer: (C) Plerome

In Hanstein's histogen theory the plerome, the central histogen of the apex, gives rise to the stele including the vascular tissues. Dermatogen forms the epidermis, periblem forms the cortex, and phellogen is the cork cambium of secondary growth.

35. Answer: (C) Mesophyll cells

In C₄ plants PEP carboxylase in the mesophyll cells fixes CO₂ into oxaloacetate, which is converted to malic acid there. The malate then moves to the bundle sheath, where it is decarboxylated, so the bundle sheath is where malate breaks down, not where it is made.

36. Answer: (C) Tobacco

Garner and Allard (1920) discovered photoperiodism while working with the Maryland Mammoth variety of tobacco, which flowered only when days became short. The other plants were not the organisms in which the effect was first shown.

37. Answer: (D) Pea

Pea seeds are non-albuminous: the endosperm is fully used up by the developing embryo, and food ends up stored in the cotyledons. Maize, coconut and castor seeds keep endosperm in the mature seed (albuminous seeds).

38. Answer: (D) Frankia

Non-leguminous *Alnus* forms root nodules with *Frankia*, a nitrogen-fixing actinomycete.

Rhizobium-group bacteria such as *Bradyrhizobium* nodulate legumes, and *Clostridium* is a free-living anaerobic fixer.

39. Answer: (B) Fermentation

In fermentation the NADH produced during glycolysis is reoxidised by passing electrons to an organic product of the substrate itself (pyruvate or acetaldehyde), so no external acceptor such as O₂ is needed. Aerobic respiration depends on oxygen as the terminal external acceptor.

40. Answer: (C) Mustard

In mustard (*Brassicaceae*) the ovary is bicarpellary with parietal placentation and becomes two-chambered by a false septum called the replum. Pea has a monocarpellary ovary with marginal placentation and no replum.

41. Answer: (B) Achenes

The fig syconus is a composite fruit: a hollow fleshy receptacle encloses many tiny achene-like fruitlets formed from the female flowers. Mericarps are parts of a schizocarpic fruit like a cremocarp, not the fruitlets of a fig.

42. Answer: (D) Quinone

Electrons leaving the PS II reaction centre are passed to a quinone acceptor (via pheophytin to plastoquinone) before reaching the cytochrome b₆f complex. Ferredoxin accepts electrons on the PS I side, much later in the chain.

43. Answer: (C) Basophils

Basophils secrete histamine, serotonin and heparin and take part in inflammatory reactions, as NCERT states. Eosinophils resist infections and are linked to allergies but are not the source of heparin.

44. Answer: (A) Cockroach - 10 pairs of spiracles (2 pairs on thorax and 8 pairs on abdomen)

The cockroach has 10 pairs of spiracles, 2 on the thorax and 8 on the abdomen. In earthworm the gizzard comes before the stomach, the frog has no neck (only head and trunk), and in rat the right kidney lies slightly higher than the left.

45. Answer: (C) Small intestine : Starch $\xrightarrow{(\alpha\text{-Amylase})}$ Disaccharide (Maltose)

In the small intestine pancreatic α -amylase breaks starch down to the disaccharide maltose. Trypsin is a protease and does not act on triglycerides, and pepsin works in the stomach, turning proteins into peptones and proteoses, not amino acids.

46. Answer: (A) Total lungs capacity minus residual volume

Vital capacity is ERV + TV + IRV, the most air that can be breathed out after a forced inspiration. Total lung capacity is VC + RV, so VC = TLC – RV. IRV + ERV leaves out the tidal volume, and IRV + TV is the inspiratory capacity.

47. Answer: (D) Overall function : Vision in poor light | Colour vision and detailed vision in bright light

Rods contain rhodopsin and handle twilight (scotopic) vision, while cones handle colour and sharp daylight (photopic) vision. Cones, not rods, are packed in the fovea and give high acuity, so any option that swaps the pigments or puts rods in the fovea is wrong.

48. Answer: (B) Floating ribs in humans - 4

Humans have 12 pairs of ribs, and the last 2 pairs (11th and 12th), which are not joined to the sternum, are the floating ribs, giving 4 in total. There are 7 cervical vertebrae, and proteins are built from 20 amino acids.

49. Answer: (B) (i)-(c), (ii)-(a), (iii)-(d), (iv)-(b)

Pills block ovulation (and implantation), a condom is a barrier that stops sperm reaching the cervix, vasectomy cuts the vas deferens so semen has no sperms, and Copper-T acts in the uterus against fertilisation and implantation. Matching a condom to 'semen contains no sperms' confuses a barrier with a surgical method.

50. Answer: (D) In the absence of HCl secretion, inactive pepsinogen is not converted into the active enzyme pepsin

Parietal (oxyntic) cells secrete HCl and intrinsic factor, and HCl is what converts pepsinogen into active pepsin. Pepsinogen itself is made by chief (peptic) cells, so blocking parietal cells would not reduce pepsinogen output.

51. Answer: (A) Na^+ ions from extracellular fluid to intracellular fluid

At the stimulated site voltage-gated Na^+ channels open and Na^+ rushes in from the extracellular fluid, reversing the polarity and producing the action potential. K^+ moving outward causes repolarisation afterwards, not the action potential itself.

52. Answer: (B) Parathormone

Parathormone raises blood Ca^{2+} by mobilising it from bone and increasing reabsorption, so its deficiency causes hypocalcaemia. Calcitonin lowers blood calcium, so a lack of it would tend to raise the level.

53. Answer: (A) Neutrophils and monocytes

NCERT states that neutrophils and monocytes (which become macrophages) are phagocytic cells that destroy foreign organisms. Lymphocytes are responsible for immune responses, not phagocytosis.

54. Answer: (B) Coelomic fluid

The fluid-filled coelomic compartments of the earthworm, squeezed by body-wall muscles, make the anterior end turgid and act as a hydrostatic skeleton. Setae only grip the soil during locomotion and do not provide the turgidity.

55. Answer: (A) Pressure difference between the post caval and atrium

During atrial diastole the pressure in the right atrium falls below that in the venae cavae, so blood flows down this pressure gradient into the atrium. SA node stimulation starts contraction (systole), not the filling of a relaxed atrium.

56. Answer: (C) Secondary spermatocytes

A primary spermatocyte finishes meiosis I to form two haploid secondary spermatocytes, which then complete meiosis II to form spermatids. Spermatids come only after the second meiotic division.

57. Answer: (D) Pollen exine

Pollen exine is made of sporopollenin, among the most resistant organic materials known, which no known enzyme can degrade; this is why pollen survives as fossils. Cuticle, cork and wood are eventually broken down by microbial enzymes.

58. Answer: (A) Intercalary meristem

In grasses like sugarcane, intercalary meristems at the base of internodes cause each internode to elongate on its own, so internodes end up with different lengths. The shoot apical meristem adds new nodes and internodes but does not set their individual lengths.

59. Answer: (C) Egg cell and antipodal cells

The egg and the antipodal cells both belong to the haploid female gametophyte (embryo sac). The secondary nucleus is diploid (two polar nuclei fused), and the megaspore mother cell and nucellus are diploid sporophytic tissue.

60. Answer: (B) It helps in the entry of pollen tube into a synergid

The filiform apparatus, the finger-like wall ingrowths at the micropylar tip of the synergids, guides the pollen tube into a synergid. It does not lead the tube from the synergid to the egg; the male gametes are released inside the synergid.

61. Answer: (B) Autogamy, but not geitonogamy

A unisexual flower carries either anthers or stigma, so pollination within the same flower (autogamy) is impossible. In monoecious plants, pollen can still pass between male and female flowers of the same plant, so geitonogamy is not prevented; only dioecy blocks both.

62. Answer: (A) Amnion

The amnion surrounds the embryo with amniotic fluid, keeping it moist and cushioned. The chorion mainly helps form the placenta, and the allantois and yolk sac do not keep the embryo hydrated.

63. Answer: (C) The menstrual fluid can easily clot

Menstrual blood normally does not clot, because fibrinolytic activity in the endometrium dissolves the clots. The first menstruation is called menarche, and about 40 ml of blood is lost per cycle. At menopause gonadotropins rise because the ovaries stop responding.

64. Answer: (A) Has a higher affinity for oxygen than that of an adult

Foetal haemoglobin ($\alpha_2\gamma_2$) binds O_2 more strongly than adult HbA, so it can take oxygen from maternal blood across the placenta. It is still a tetramer of four globin chains, not two.

65. Answer: (D) a, c

NCERT notes that MTP in the first trimester (up to 12 weeks) is relatively safe, and that IUDs like Copper-T are effective contraceptives. Lactational amenorrhoea is reliable only up to about six months after birth, and emergency pills must be taken within 72 hours, not a week.

66. Answer: (A) Causes strong uterine contractions during parturition

Oxytocin causes strong contractions of the uterine smooth muscle during birth and triggers milk ejection. It is made in the hypothalamus and released from the posterior pituitary, not the anterior. Mammary gland growth is driven by other hormones such as prolactin, oestrogen and progesterone.

67. Answer: (B) CFCs 14%, Methane 20%

The figures in the old NCERT pie chart were CO_2 60%, CH_4 20%, CFCs 14% and N_2O 6%. Only the pair CFCs 14% with methane 20% matches; the other options pair one right figure with a wrong one.

68. Answer: (B) Temperate deciduous forests

Oaks (*Quercus*) are the typical dominant trees of temperate broad-leaved deciduous forests, including those of the Himalayan temperate zone. Tropical rain forests are dominated by trees such as *Dipterocarpus*, and alpine zones by *Rhododendron* and junipers.

69. Answer: (D) Oceans

The old NCERT carbon cycle section states that about 71% of global carbon is dissolved in the oceans, which act as the main reservoir and regulate atmospheric CO_2 . Forests, while important carbon sinks, hold much less.

70. Answer: (D) Lesser inter-specific competition

Hotspots are defined by very high species richness, high endemism and severe threat of habitat and species loss. With so many species packed together, interspecific competition is high, not low.

71. Answer: (A) South Africa

The 2002 World Summit on Sustainable Development was held in Johannesburg, South Africa, where 190 countries pledged to reduce the rate of biodiversity loss by 2010. The 1992 Earth Summit was held in Rio de Janeiro, Brazil, which is the usual trap.

72. Answer: (B) b, c

Removing predators lets herbivores like deer multiply, and because only about 10% of energy passes to each higher level, food chains are usually limited to 3-4 trophic levels. Removing tigers would reduce vegetation through overgrazing rather than increase it, and 8-level chains do not occur.

73. Answer: (B) 2.5 or less

CPCB identifies particulate matter of 2.5 μm or less (PM2.5) as the most harmful, because these particles are inhaled deep into the lungs and cause breathing problems, inflammation and damage. Larger particles are mostly trapped in the upper respiratory tract.

74. Answer: (D) a, c

Fertiliser runoff rich in nitrates and phosphates triggers algal blooms (the water turns green), and when the algae die their decomposition uses up dissolved oxygen and gives off foul smells, killing fish within days. DDT biomagnifies slowly over time and would not explain sudden mass death alongside these signs, and phytoplankton increase rather than decline.

75. Answer: (B) c and d

The kangaroo rat lives on dry seeds and meets its water needs from metabolic water produced by oxidising its food. It produces highly concentrated urine and does not sweat to cool itself. Dark colour, solid urine and a thick hair coat are not its adaptations.

76. Answer: (A) Golden rice

Golden rice is engineered to make β -carotene, the precursor of vitamin A, whose deficiency causes night blindness. Flavr Savr tomato was modified for delayed ripening and Bt crops for insect resistance, neither of which targets vitamin A.

77. Answer: (B) Xanthomonas

Bacterial leaf blight of rice is caused by *Xanthomonas oryzae* pv. *oryzae*. *Alternaria* is a fungus, and *Erwinia* mostly causes soft rots.

78. Answer: (C) Downy mildew of grapes

Millardet in Bordeaux, France, noticed that vines sprayed with a copper sulphate and lime mixture escaped downy mildew (*Plasmopara viticola*), which led to Bordeaux mixture being used as a fungicide. Bacterial leaf blight is bacterial and is not controlled this way.

79. Answer: (B) Jatropha

Jatropha curcas seeds yield a non-edible oil that can be turned into biodiesel, and it has been promoted in India as a biofuel crop on wastelands. *Azadirachta* (neem) is used as a biopesticide, not a fuel.

80. Answer: (A) Biological control of soil-borne plant pathogens

Trichoderma species are free-living fungi in the root ecosystem, and NCERT lists them as biocontrol agents against several plant pathogens. Gene transfer in plants is done with *Agrobacterium*, not *Trichoderma*.

81. Answer: (C) Separation of DNA fragments according to their size

In agarose gel electrophoresis negatively charged DNA fragments move toward the anode, and the gel's sieving effect separates them by size, smaller ones travelling farther. Cutting DNA is done by restriction enzymes and joining by ligase.

82. Answer: (D) Physiological barriers

NCERT classes acid in the stomach, saliva in the mouth and tears from the eyes as physiological barriers that stop microbial growth. Physical barriers are the skin and the mucus lining of the tracts.

83. Answer: (A) a-(ii), b-(iii), c-(iv), d-(i)

Amoebiasis spreads through contaminated food and water, so sterilised food and water prevent it; diphtheria is prevented by the DPT vaccine; cholera dehydration is treated with oral rehydration; and syphilis is caused by *Treponema pallidum*. *Treponema* is a bacterium, not the cause of amoebiasis.

84. Answer: (D) a and c

A heart-lung machine takes over circulation during open-heart surgery, and CAT scanning builds cross-sectional images of internal structures. Angiography only images vessels (angioplasty removes blockages), and plain X-rays do not give detailed soft-tissue images of organs such as the prostate.

85. Answer: (C) UAG, UGA - Stop

UAA, UAG and UGA are the three stop codons. In the other options only one codon of each pair fits: UCA codes serine, GUU codes valine and ACG codes threonine.

86. Answer: (A) Boll worms

NCERT notes that the proteins coded by *cryIAc* and *cryIIAb* control cotton bollworms, and *cryIAb* controls the corn borer. Nematodes are controlled by RNA interference in the NCERT example, not by Cry toxins.

87. Answer: (C) Alkaliphiles

Laundry detergents work in alkaline wash water, so the proteases and lipases added to them come from alkaliphilic microbes (for example alkaliphilic *Bacillus* species) whose enzymes stay active at high pH. Enzymes from acidophiles would lose activity in an alkaline detergent solution.

88. Answer: (B) DNA ligase

Cohen and Boyer joined the antibiotic resistance gene to the plasmid using DNA ligase, which seals the sugar-phosphate backbone between the cut ends. Restriction endonucleases only cut DNA; they do not join fragments.

89. Answer: (A) *Paecilomyces lilacinus*

Paecilomyces lilacinus is a nematophagous fungus that parasitises the eggs of root-knot and cyst nematodes and is sold as a bionematicide. *Pisolithus tinctorius* is an ectomycorrhizal fungus, and *Gliocladium virens* and *Pseudomonas cepacia* are mainly used against fungal pathogens.

90. Answer: (B) Eliminate weeds from the field without the use of manual labour

Herbicide-tolerant crops survive a broad-spectrum herbicide that kills the weeds around them, so fields can be weeded chemically instead of by manual labour. Herbicides are still sprayed, so 'without the use of herbicides' is wrong.

91. Answer: (D) (c) and (d)

Bacterial blight is seed-borne, so sowing disease-free seed and growing resistant varieties are the reliable controls. Bordeaux mixture is mainly a fungicide, and this disease has no insect vector to target.

92. Answer: (B) Escherichia

Eli Lilly produced human insulin (1983) by inserting DNA for the A and B chains into plasmids of *E. coli* and then joining the chains. *Saccharomyces* has also been used, but the standard NCERT answer is *Escherichia coli*.

93. Answer: (C) It has no blood supply

The cornea is avascular, so immune cells and antibodies carried in the blood rarely reach the graft and rejection seldom occurs. The cornea is living tissue with nucleated cells, so the 'non-living' and 'enucleated' options are false.

94. Answer: (B) Parathyroid and Adrenal

Parathyroid and adrenal glands are purely endocrine. The pancreas also has an exocrine part, and the ovary and testis also produce gametes, so each of the other pairs includes an organ with non-endocrine functions.

95. Answer: (D) When a piece of RNA that is complementary in sequence is used to stop expression of a specific gene

Antisense technology uses an RNA (or DNA) strand complementary to a target mRNA. It pairs with the mRNA and blocks its translation, silencing the gene, the same principle as RNA interference in NCERT. Making DNA from RNA is reverse transcription, not antisense technology.

Questions as set in the AIPMT/NEET papers conducted by CBSE and NTA. Answers checked and explanations written by the RankUp team. RankUp is not affiliated with CBSE or NTA.