

NEET 2019 — Biology Question Paper with Solutions

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

NEET 2019 · Q91

1. The Earth Summit held in Rio de Janeiro in 1992 was called :

- (A) to reduce CO₂ emissions and global warming.
- (B) for conservation of biodiversity and sustainable utilization of its benefits.
- (C) to assess threat posed to native species by invasive weed species.
- (D) for immediate steps to discontinue use of CFCs that were damaging the ozone layer.

NEET 2019 · Q92

2. Colostrum, the yellowish fluid, secreted by mother during the initial days of lactation is very essential to impart immunity to the newborn infants because it contains :

- (A) Natural killer cells
- (B) Monocytes
- (C) Macrophages
- (D) Immunoglobulin A

NEET 2019 · Q93

3. Grass leaves curl inwards during very dry weather. Select the most appropriate reason from the following :

- (A) Closure of stomata
- (B) Flaccidity of bulliform cells
- (C) Shrinkage of air spaces in spongy mesophyll
- (D) Tyloses in vessels

NEET 2019 · Q94

4. The shorter and longer arms of a submetacentric chromosome are referred to as :

- (A) s-arm and l-arm respectively
- (B) p-arm and q-arm respectively
- (C) q-arm and p-arm respectively
- (D) m-arm and n-arm respectively

NEET 2019 · Q95

5. Respiratory Quotient (RQ) value of tripalmitin is :

- (A) 0.9
- (B) 0.7
- (C) 0.07
- (D) 0.09

NEET 2019 · Q96

6. Which of the following is a commercial blood cholesterol lowering agent ?

- (A) Cyclosporin A
- (B) Statin
- (C) Streptokinase
- (D) Lipases

NEET 2019 · Q97

7. Match the following structures with their respective location in organs :

- (a) Crypts of Lieberkühn — (i) Pancreas**
- (b) Glisson's Capsule — (ii) Duodenum**
- (c) Islets of Langerhans — (iii) Small intestine**
- (d) Brunner's Glands — (iv) Liver**

Select the correct option from the following :

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

NEET 2019 · Q98

8. Which of the following is the most important cause for animals and plants being driven to extinction ?

- (A) Habitat loss and fragmentation
- (B) Drought and floods
- (C) Economic exploitation
- (D) Alien species invasion

NEET 2019 · Q99

9. Which part of the brain is responsible for thermoregulation ?

- (A) Cerebrum
- (B) Hypothalamus
- (C) Corpus callosum
- (D) Medulla oblongata

NEET 2019 · Q100

10. Consider following features :

- (a) Organ system level of organisation**
- (b) Bilateral symmetry**
- (c) True coelomates with segmentation of body**

Select the correct option of animal groups which possess all the above characteristics.

- (A) Annelida, Arthropoda and Chordata
- (B) Annelida, Arthropoda and Mollusca
- (C) Arthropoda, Mollusca and Chordata
- (D) Annelida, Mollusca and Chordata

NEET 2019 · Q101

11. Select the correct sequence of organs in the alimentary canal of cockroach starting from mouth :

- (A) Pharynx → Oesophagus → Crop → Gizzard → Ileum → Colon → Rectum
- (B) Pharynx → Oesophagus → Gizzard → Crop → Ileum → Colon → Rectum
- (C) Pharynx → Oesophagus → Gizzard → Ileum → Crop → Colon → Rectum
- (D) Pharynx → Oesophagus → Ileum → Crop → Gizzard → Colon → Rectum

NEET 2019 · Q102

12. Which of the following pairs of gases is mainly responsible for green house effect ?

- (A) Ozone and Ammonia
- (B) Oxygen and Nitrogen
- (C) Nitrogen and Sulphur dioxide
- (D) Carbon dioxide and Methane

NEET 2019 · Q103

13. Which of the following muscular disorders is inherited ?

- (A) Tetany
- (B) Muscular dystrophy
- (C) Myasthenia gravis
- (D) Botulism

NEET 2019 · Q104

14. The ciliated epithelial cells are required to move particles or mucus in a specific direction. In humans, these cells are mainly present in :

- (A) Bile duct and Bronchioles
- (B) Fallopian tubes and Pancreatic duct
- (C) Eustachian tube and Salivary duct
- (D) Bronchioles and Fallopian tubes

NEET 2019 · Q105

15. Match the Column - I with Column - II :

(a) P - wave — (i) Depolarisation of ventricles

(b) QRS complex — (ii) Repolarisation of ventricles

(c) T - wave — (iii) Coronary ischemia

(d) Reduction in the size of T - wave — (iv) Depolarisation of atria

(v) Repolarisation of atria

Select the correct option.

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

NEET 2019 · Q106

16. Which one of the following is not a method of in situ conservation of biodiversity ?

- (A) Biosphere Reserve
- (B) Wildlife Sanctuary
- (C) Botanical Garden
- (D) Sacred Grove

NEET 2019 · Q107

17. In a species, the weight of newborn ranges from 2 to 5 kg. 97% of the newborn with an average weight between 3 to 3.3 kg survive whereas 99% of the infants born with weights from 2 to 2.5 kg or 4.5 to 5 kg die. Which type of selection process is taking place ?

- (A) Directional Selection
- (B) Stabilizing Selection
- (C) Disruptive Selection
- (D) Cyclical Selection

NEET 2019 · Q108

18. The correct sequence of phases of cell cycle is :

- (A) M → G₁ → G₂ → S
- (B) G₁ → G₂ → S → M
- (C) S → G₁ → G₂ → M
- (D) G₁ → S → G₂ → M

NEET 2019 · Q109

19. How does steroid hormone influence the cellular activities ?

- (A) Changing the permeability of the cell membrane.
- (B) Binding to DNA and forming a gene-hormone complex.
- (C) Activating cyclic AMP located on the cell membrane.
- (D) Using aquaporin channels as second messenger.

NEET 2019 · Q110

20. Which of the following statements is not correct ?

- (A) Lysosomes have numerous hydrolytic enzymes.
- (B) The hydrolytic enzymes of lysosomes are active under acidic pH.
- (C) Lysosomes are membrane bound structures.
- (D) Lysosomes are formed by the process of packaging in the endoplasmic reticulum.

NEET 2019 · Q111

21. Which one of the following statements regarding post-fertilization development in flowering plants is incorrect ?

- (A) Ovary develops into fruit
- (B) Zygote develops into embryo
- (C) Central cell develops into endosperm
- (D) Ovules develop into embryo sac

NEET 2019 · Q112

22. Concanavalin A is :

- (A) an alkaloid
- (B) an essential oil
- (C) a lectin
- (D) a pigment

NEET 2019 · Q113

23. Which one of the following equipments is essentially required for growing microbes on a large scale, for industrial production of enzymes ?

- (A) BOD incubator
- (B) Sludge digester
- (C) Industrial oven
- (D) Bioreactor

NEET 2019 · Q115

24. Purines found both in DNA and RNA are :

- (A) Adenine and thymine
- (B) Adenine and guanine
- (C) Guanine and cytosine
- (D) Cytosine and thymine

NEET 2019 · Q116

25. Select the correct sequence for transport of sperm cells in male reproductive system.

- (A) Testis → Epididymis → Vasa efferentia → Rete testis → Inguinal canal → Urethra
- (B) Seminiferous tubules → Rete testis → Vasa efferentia → Epididymis → Vas deferens → Ejaculatory duct → Urethra → Urethral meatus
- (C) Seminiferous tubules → Vasa efferentia → Epididymis → Inguinal canal → Urethra
- (D) Testis → Epididymis → Vasa efferentia → Vas deferens → Ejaculatory duct → Inguinal canal → Urethra → Urethral meatus

NEET 2019 · Q117

26. Match the hominids with their correct brain size :

- (a) *Homo habilis* — (i) 900 cc
- (b) *Homo neanderthalensis* — (ii) 1350 cc
- (c) *Homo erectus* — (iii) 650-800 cc
- (d) *Homo sapiens* — (iv) 1400 cc

Select the correct option.

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

NEET 2019 · Q118

27. Variations caused by mutation, as proposed by Hugo de Vries, are :

- (A) random and directional
- (B) random and directionless
- (C) small and directional
- (D) small and directionless

NEET 2019 · Q119

28. Which of the following pair of organelles does not contain DNA ?

- (A) Mitochondria and Lysosomes
- (B) Chloroplast and Vacuoles
- (C) Lysosomes and Vacuoles
- (D) Nuclear envelope and Mitochondria

NEET 2019 · Q120

29. Due to increasing air-borne allergens and pollutants, many people in urban areas are suffering from respiratory disorder causing wheezing due to :

- (A) benign growth on mucous lining of nasal cavity.
- (B) inflammation of bronchi and bronchioles.
- (C) proliferation of fibrous tissues and damage of the alveolar walls.
- (D) reduction in the secretion of surfactants by pneumocytes.

NEET 2019 · Q121

30. Select the incorrect statement.

- (A) Male fruit fly is heterogametic.
- (B) In male grasshoppers, 50% of sperms have no sex-chromosome.
- (C) In domesticated fowls, sex of progeny depends on the type of sperm rather than egg.
- (D) Human males have one of their sex-chromosome much shorter than the other.

NEET 2019 · Q122

31. DNA precipitation out of a mixture of biomolecules can be achieved by treatment with :

- (A) Isopropanol
- (B) Chilled ethanol
- (C) Methanol at room temperature
- (D) Chilled chloroform

NEET 2019 · Q123

32. Select the correct group of biocontrol agents.

- (A) *Bacillus thuringiensis*, Tobacco mosaic virus, Aphids
- (B) *Trichoderma*, Baculovirus, *Bacillus thuringiensis*
- (C) *Oscillatoria*, *Rhizobium*, *Trichoderma*
- (D) *Nostoc*, *Azospirillum*, Nucleopolyhedrovirus

NEET 2019 · Q125

33. Match the following organisms with the products they produce :

- (a) *Lactobacillus* — (i) Cheese
- (b) *Saccharomyces cerevisiae* — (ii) Curd
- (c) *Aspergillus niger* — (iii) Citric Acid
- (d) *Acetobacter aceti* — (iv) Bread
- (v) Acetic Acid

Select the correct option.

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

NEET 2019 · Q126

34. What is the direction of movement of sugars in phloem ?

- (A) Non-multidirectional
- (B) Upward
- (C) Downward
- (D) Bi-directional

NEET 2019 · Q127

35. In some plants, the female gamete develops into embryo without fertilization. This phenomenon is known as :

- (A) Autogamy
- (B) Parthenocarpy
- (C) Syngamy
- (D) Parthenogenesis

NEET 2019 · Q128

36. Persistent nucellus in the seed is known as :

- (A) Chalaza
- (B) Perisperm
- (C) Hilum
- (D) Tegmen

NEET 2019 · Q129

37. What map unit (Centimorgan) is adopted in the construction of genetic maps ?

- (A) A unit of distance between two expressed genes, representing 10% cross over.
- (B) A unit of distance between two expressed genes, representing 100% cross over.
- (C) A unit of distance between genes on chromosomes, representing 1% cross over.
- (D) A unit of distance between genes on chromosomes, representing 50% cross over.

NEET 2019 · Q130

38. What would be the heart rate of a person if the cardiac output is 5 L, blood volume in the ventricles at the end of diastole is 100 mL and at the end of ventricular systole is 50 mL ?

- (A) 50 beats per minute
- (B) 75 beats per minute
- (C) 100 beats per minute
- (D) 125 beats per minute

NEET 2019 · Q132

39. Which of the following factors is responsible for the formation of concentrated urine ?

- (A) Low levels of antidiuretic hormone.
- (B) Maintaining hyperosmolarity towards inner medullary interstitium in the kidneys.
- (C) Secretion of erythropoietin by Juxtaglomerular complex.
- (D) Hydrostatic pressure during glomerular filtration.

NEET 2019 · Q133

40. Which of the following statements regarding mitochondria is incorrect ?

- (A) Outer membrane is permeable to monomers of carbohydrates, fats and proteins.
- (B) Enzymes of electron transport are embedded in outer membrane.
- (C) Inner membrane is convoluted with infoldings.
- (D) Mitochondrial matrix contains single circular DNA molecule and ribosomes.

NEET 2019 · Q134

41. Xylem translocates :

- (A) Water only
- (B) Water and mineral salts only
- (C) Water, mineral salts and some organic nitrogen only
- (D) Water, mineral salts, some organic nitrogen and hormones

NEET 2019 · Q135

42. Cells in G₀ phase :

- (A) exit the cell cycle
- (B) enter the cell cycle
- (C) suspend the cell cycle
- (D) terminate the cell cycle

NEET 2019 · Q136

43. Which of the statements given below is not true about formation of Annual Rings in trees ?

- (A) Annual ring is a combination of spring wood and autumn wood produced in a year.
- (B) Differential activity of cambium causes light and dark bands of tissue - early and late wood respectively.
- (C) Activity of cambium depends upon variation in climate.
- (D) Annual rings are not prominent in trees of temperate region.

NEET 2019 · Q137

44. Which of the following ecological pyramids is generally inverted ?

- (A) Pyramid of numbers in grassland
- (B) Pyramid of energy
- (C) Pyramid of biomass in a forest
- (D) Pyramid of biomass in a sea

NEET 2019 · Q138

45. Placentation, in which ovules develop on the inner wall of the ovary or in peripheral part, is :

- (A) Basal
- (B) Axile
- (C) Parietal
- (D) Free central

NEET 2019 · Q139

46. Which of the following protocols did aim for reducing emission of chlorofluorocarbons into the atmosphere ?

- (A) Montreal Protocol
- (B) Kyoto Protocol
- (C) Gothenburg Protocol
- (D) Geneva Protocol

NEET 2019 · Q141

47. Tidal Volume and Expiratory Reserve Volume of an athlete is 500 mL and 1000 mL respectively. What will be his Expiratory Capacity if the Residual Volume is 1200 mL ?

- (A) 1500 mL
- (B) 1700 mL
- (C) 2200 mL
- (D) 2700 mL

NEET 2019 · Q142

48. What is the fate of the male gametes discharged in the synergid ?

- (A) One fuses with the egg, other(s) degenerate(s) in the synergid.
- (B) All fuse with the egg.
- (C) One fuses with the egg, other(s) fuse(s) with synergid nucleus.
- (D) One fuses with the egg and other fuses with central cell nuclei.

NEET 2019 · Q143

49. What is the site of perception of photoperiod necessary for induction of flowering in plants ?

- (A) Lateral buds
- (B) Pulvinus
- (C) Shoot apex
- (D) Leaves

NEET 2019 · Q144

50. Select the correctly written scientific name of Mango which was first described by Carolus Linnaeus :

- (A) Mangifera indica Car. Linn.
- (B) Mangifera indica Linn.
- (C) Mangifera indica
- (D) Mangifera Indica

NEET 2019 · Q145

51. Following statements describe the characteristics of the enzyme Restriction Endonuclease. Identify the incorrect statement.

- (A) The enzyme cuts DNA molecule at identified position within the DNA.
- (B) The enzyme binds DNA at specific sites and cuts only one of the two strands.
- (C) The enzyme cuts the sugar-phosphate backbone at specific sites on each strand.
- (D) The enzyme recognizes a specific palindromic nucleotide sequence in the DNA.

NEET 2019 · Q147

52. In Antirrhinum (Snapdragon), a red flower was crossed with a white flower and in F₁ generation, pink flowers were obtained. When pink flowers were selfed, the F₂ generation showed white, red and pink flowers. Choose the incorrect statement from the following :

- (A) This experiment does not follow the Principle of Dominance.
- (B) Pink colour in F₁ is due to incomplete dominance.
- (C) Ratio of F₂ is 1/4 (Red) : 2/4 (Pink) : 1/4 (White)
- (D) Law of Segregation does not apply in this experiment.

NEET 2019 · Q148

53. Conversion of glucose to glucose-6-phosphate, the first irreversible reaction of glycolysis, is catalyzed by :

- (A) Aldolase
- (B) Hexokinase
- (C) Enolase
- (D) Phosphofructokinase

NEET 2019 · Q149

54. Drug called 'Heroin' is synthesized by :

- (A) methylation of morphine
- (B) acetylation of morphine
- (C) glycosylation of morphine
- (D) nitration of morphine

NEET 2019 · Q150

55. Select the hormone-releasing Intra-Uterine Devices.

- (A) Vaults, LNG-20
- (B) Multiload 375, Progestasert
- (C) Progestasert, LNG-20
- (D) Lippes Loop, Multiload 375

NEET 2019 · Q151

56. A gene locus has two alleles A, a. If the frequency of dominant allele A is 0.4, then what will be the frequency of homozygous dominant, heterozygous and homozygous recessive individuals in the population ?

- (A) 0.36 (AA); 0.48 (Aa); 0.16 (aa)
- (B) 0.16 (AA); 0.24 (Aa); 0.36 (aa)
- (C) 0.16 (AA); 0.48 (Aa); 0.36 (aa)
- (D) 0.16 (AA); 0.36 (Aa); 0.48 (aa)

NEET 2019 · Q152

57. Which of the following is true for Golden rice ?

- (A) It is Vitamin A enriched, with a gene from daffodil.
- (B) It is pest resistant, with a gene from *Bacillus thuringiensis*.
- (C) It is drought tolerant, developed using *Agrobacterium* vector.
- (D) It has yellow grains, because of a gene introduced from a primitive variety of rice.

NEET 2019 · Q153

58. Pinus seed cannot germinate and establish without fungal association. This is because :

- (A) its embryo is immature.
- (B) it has obligate association with mycorrhizae.
- (C) it has very hard seed coat.
- (D) its seeds contain inhibitors that prevent germination.

NEET 2019 · Q154

59. Which of the following features of genetic code does allow bacteria to produce human insulin by recombinant DNA technology ?

- (A) Genetic code is not ambiguous
- (B) Genetic code is redundant
- (C) Genetic code is nearly universal
- (D) Genetic code is specific

NEET 2019 · Q156

60. Which of the following statements is incorrect ?

- (A) Viroids lack a protein coat.
- (B) Viruses are obligate parasites.
- (C) Infective constituent in viruses is the protein coat.
- (D) Prions consist of abnormally folded proteins.

NEET 2019 · Q157

61. Match the following organisms with their respective characteristics :

(a) Pila — (i) Flame cells

(b) Bombyx — (ii) Comb plates

(c) Pleurobrachia — (iii) Radula

(d) Taenia — (iv) Malpighian tubules

Select the correct option from the following :

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

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

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

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

NEET 2019 · Q158

62. Expressed Sequence Tags (ESTs) refers to :

(A) Genes expressed as RNA

(B) Polypeptide expression

(C) DNA polymorphism

(D) Novel DNA sequences

NEET 2019 · Q159

63. Which of the following statements is incorrect ?

(A) Morels and truffles are edible delicacies.

(B) Claviceps is a source of many alkaloids and LSD.

(C) Conidia are produced exogenously and ascospores endogenously.

(D) Yeasts have filamentous bodies with long thread-like hyphae.

NEET 2019 · Q160

64. Match Column - I with Column - II.

(a) Saprophyte — (i) Symbiotic association of fungi with plant roots

(b) Parasite — (ii) Decomposition of dead organic materials

(c) Lichens — (iii) Living on living plants or animals

(d) Mycorrhiza — (iv) Symbiotic association of algae and fungi

Choose the correct answer from the options given below :

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

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

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

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

NEET 2019 · Q161

65. Which of the following glucose transporters is insulin-dependent ?

(A) GLUT I

(B) GLUT II

(C) GLUT III

(D) GLUT IV

NEET 2019 · Q162

66. Which of the following immune responses is responsible for rejection of kidney graft ?

(A) Auto-immune response

(B) Humoral immune response

(C) Inflammatory immune response

(D) Cell-mediated immune response

NEET 2019 · Q163

67. Use of an artificial kidney during hemodialysis may result in :

- (a) Nitrogenous waste build-up in the body**
- (b) Non-elimination of excess potassium ions**
- (c) Reduced absorption of calcium ions from gastro-intestinal tract**
- (d) Reduced RBC production**

Which of the following options is the most appropriate ?

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

NEET 2019 · Q165

68. The frequency of recombination between gene pairs on the same chromosome as a measure of the distance between genes was explained by :

- (A) T.H. Morgan
- (B) Gregor J. Mendel
- (C) Alfred Sturtevant
- (D) Sutton Boveri

NEET 2019 · Q166

69. Match the following genes of the Lac operon with their respective products :

- (a) i gene — (i) β -galactosidase**
- (b) z gene — (ii) Permease**
- (c) a gene — (iii) Repressor**
- (d) y gene — (iv) Transacetylase**

Select the correct option.

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

NEET 2019 · Q167

70. It takes very long time for pineapple plants to produce flowers. Which combination of hormones can be applied to artificially induce flowering in pineapple plants throughout the year to increase yield ?

- (A) Auxin and Ethylene
- (B) Gibberellin and Cytokinin
- (C) Gibberellin and Absciscic acid
- (D) Cytokinin and Absciscic acid

NEET 2019 · Q168

71. Identify the cells whose secretion protects the lining of gastro-intestinal tract from various enzymes.

- (A) Chief Cells
- (B) Goblet Cells
- (C) Oxyntic Cells
- (D) Duodenal Cells

NEET 2019 · Q169

72. Which of the following can be used as a biocontrol agent in the treatment of plant disease ?

- (A) Trichoderma
- (B) Chlorella
- (C) Anabaena
- (D) Lactobacillus

NEET 2019 · Q170

73. Phloem in gymnosperms lacks :

- (A) Albuminous cells and sieve cells
- (B) Sieve tubes only
- (C) Companion cells only
- (D) Both sieve tubes and companion cells

NEET 2019 · Q172

74. Under which of the following conditions will there be no change in the reading frame of following mRNA ?

5' AACAGCGGUGCUAAU 3'

- (A) Insertion of G at 5th position
- (B) Deletion of G from 5th position
- (C) Insertion of A and G at 4th and 5th positions respectively
- (D) Deletion of GGU from 7th, 8th and 9th positions

NEET 2019 · Q173

75. The concept of "Omnis cellula-e cellula" regarding cell division was first proposed by :

- (A) Rudolf Virchow
- (B) Theodore Schwann
- (C) Schleiden
- (D) Aristotle

NEET 2019 · Q174

76. What triggers activation of protoxin to active Bt toxin of *Bacillus thuringiensis* in boll worm ?

- (A) Body temperature
- (B) Moist surface of midgut
- (C) Alkaline pH of gut
- (D) Acidic pH of stomach

NEET 2019 · Q175

77. Identify the correct pair representing the causative agent of typhoid fever and the confirmatory test for typhoid.

- (A) *Plasmodium vivax* / UTI test
- (B) *Streptococcus pneumoniae* / Widal test
- (C) *Salmonella typhi* / Anthrone test
- (D) *Salmonella typhi* / Widal test

NEET 2019 · Q176

78. What is the genetic disorder in which an individual has an overall masculine development, gynaecomastia, and is sterile ?

- (A) Turner's syndrome
- (B) Klinefelter's syndrome
- (C) Edward syndrome
- (D) Down's syndrome

NEET 2019 · Q177

79. Polyblend, a fine powder of recycled modified plastic, has proved to be a good material for :

- (A) making plastic sacks
- (B) use as a fertilizer
- (C) construction of roads
- (D) making tubes and pipes

80. Which of these following methods is the most suitable for disposal of nuclear waste ?

- (A) Shoot the waste into space
- (B) Bury the waste under Antarctic ice-cover
- (C) Dump the waste within rocks under deep ocean
- (D) Bury the waste within rocks deep below the Earth's surface

81. Match the following hormones with the respective disease :

- (a) Insulin — (i) Addison's disease**
- (b) Thyroxin — (ii) Diabetes insipidus**
- (c) Corticoids — (iii) Acromegaly**
- (d) Growth Hormone — (iv) Goitre**
- (v) Diabetes mellitus**

Select the correct option.

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

82. Select the correct option.

- (A) 8th, 9th and 10th pairs of ribs articulate directly with the sternum.
- (B) 11th and 12th pairs of ribs are connected to the sternum with the help of hyaline cartilage.
- (C) Each rib is a flat thin bone and all the ribs are connected dorsally to the thoracic vertebrae and ventrally to the sternum.
- (D) There are seven pairs of vertebrosteral, three pairs of vertebrochondral and two pairs of vertebral ribs.

Answer key and explanations

1. Answer: (B) for conservation of biodiversity and sustainable utilization of its benefits.

The 1992 Earth Summit in Rio de Janeiro called upon all nations to take measures for conservation of biodiversity and sustainable utilisation of its benefits (Convention on Biological Diversity). CO₂ reduction targets came with the Kyoto Protocol, and phasing out CFCs was the aim of the Montreal Protocol.

2. Answer: (D) Immunoglobulin A

Colostrum is rich in IgA antibodies, which give the newborn passive immunity. Cells like NK cells, monocytes and macrophages are not the protective component that colostrum is valued for.

3. Answer: (B) Flaccidity of bulliform cells

Bulliform (motor) cells in the upper epidermis of grass leaves lose water and become flaccid during water stress, so the leaf rolls inwards to cut water loss. Closing stomata reduces transpiration but does not by itself roll the leaf.

4. Answer: (B) p-arm and q-arm respectively

The short arm of a chromosome is called the p-arm (petite) and the long arm the q-arm. Writing them the other way round reverses the convention.

5. Answer: (B) 0.7

$2 \text{ C}_{51}\text{H}_{98}\text{O}_6 + 145 \text{ O}_2 \rightarrow 102 \text{ CO}_2 + 98 \text{ H}_2\text{O} + \text{energy}$, so $\text{RQ} = 102/145 \approx 0.7$. RQ values for fats are below 1 because fats need more oxygen for oxidation; values like 0.07 are off by a factor of ten.

6. Answer: (B) Statin

Statins, produced by the yeast *Monascus purpureus*, competitively inhibit the enzyme of cholesterol synthesis and lower blood cholesterol. Cyclosporin A is an immunosuppressant and streptokinase is a clot buster.

7. Answer: (C) (a)-(iii), (b)-(iv), (c)-(i), (d)-(ii)

Crypts of Lieberkühn are intestinal glands of the small intestine, Glisson's capsule covers the hepatic lobules of the liver, islets of Langerhans are the endocrine part of the pancreas, and Brunner's glands are submucosal glands of the duodenum. Placing Brunner's glands in the liver or Glisson's capsule in the duodenum is the usual mix-up.

8. Answer: (A) Habitat loss and fragmentation

Habitat loss and fragmentation is the most important cause of biodiversity loss among the 'Evil Quartet'. Alien species invasion and over-exploitation are real causes but contribute less.

9. Answer: (B) Hypothalamus

The hypothalamus contains centres that control body temperature, hunger and thirst. The medulla controls respiration and cardiovascular reflexes, not temperature.

10. Answer: (A) Annelida, Arthropoda and Chordata

Annelids, arthropods and chordates are all bilateral, organ-system level, true coelomates with metameric segmentation. Molluscs are coelomate but unsegmented, so any group including Mollusca fails.

11. Answer: (A) Pharynx → Oesophagus → Crop → Gizzard → Ileum → Colon → Rectum

In the cockroach the oesophagus opens into a sac-like crop that stores food, followed by the grinding gizzard; the midgut then leads to the hindgut made of ileum, colon and rectum. The gizzard comes after the crop, not before it.

12. Answer: (D) Carbon dioxide and Methane

Carbon dioxide is the largest contributor to the enhanced greenhouse effect, followed by methane. Oxygen and nitrogen do not absorb infrared radiation significantly.

13. Answer: (B) Muscular dystrophy

Muscular dystrophy is a genetic disorder causing progressive degeneration of skeletal muscle. Myasthenia gravis is an autoimmune disease, tetany comes from low blood Ca^{2+} , and botulism is a bacterial toxin poisoning.

14. Answer: (D) Bronchioles and Fallopian tubes

Ciliated epithelium lines hollow organs such as the bronchioles and fallopian tubes, where cilia move mucus or the ovum in one direction. Ducts of glands such as bile, pancreatic and salivary ducts are lined by cuboidal or columnar epithelium without cilia.

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

The P-wave is atrial depolarisation, the QRS complex is ventricular depolarisation and the T-wave is ventricular repolarisation. A reduced or flattened T-wave indicates coronary ischemia; atrial repolarisation is hidden in the QRS complex and is not matched to any wave.

16. Answer: (C) Botanical Garden

A botanical garden keeps plants away from their natural habitat, so it is ex situ conservation. Biosphere reserves, wildlife sanctuaries and sacred groves protect species in their natural habitat.

17. Answer: (B) Stabilizing Selection

Individuals with the average (intermediate) weight survive while both extremes die, which is stabilizing selection. Disruptive selection would favour both extremes, and directional selection would favour only one extreme.

18. Answer: (D) $G_1 \rightarrow S \rightarrow G_2 \rightarrow M$

Interphase runs G_1 (growth), then S (DNA synthesis), then G_2 (preparation for division), followed by the M phase. DNA synthesis comes between the two gap phases, not after G_2 .

19. Answer: (B) Binding to DNA and forming a gene-hormone complex.

Steroid hormones are lipid soluble; they enter the cell, bind intracellular receptors and the hormone-receptor complex binds the genome to regulate gene expression. cAMP second messengers are used by protein/peptide hormones acting on membrane receptors.

20. Answer: (D) Lysosomes are formed by the process of packaging in the endoplasmic reticulum.

Lysosomes are membrane-bound vesicles formed by packaging in the Golgi apparatus, not the endoplasmic reticulum. They do contain many acid hydrolases active at acidic pH.

21. Answer: (D) Ovules develop into embryo sac

After fertilisation ovules develop into seeds; the embryo sac forms inside the ovule before fertilisation. The ovary becoming the fruit, the zygote the embryo and the central cell (primary endosperm nucleus) the endosperm are all correct.

22. Answer: (C) a lectin

Concanavalin A is a lectin, a carbohydrate-binding protein from jack bean, listed among secondary metabolites. Alkaloids such as morphine and essential oils such as lemongrass oil are different classes.

23. Answer: (D) Bioreactor

Large volumes (100–1000 litres) of culture are grown in bioreactors, which provide optimal temperature, pH, aeration and mixing. A sludge digester is used in sewage treatment, not enzyme production.

24. Answer: (B) Adenine and guanine

The purines adenine and guanine occur in both DNA and RNA. Cytosine, thymine and uracil are pyrimidines, and thymine is found only in DNA.

25. Answer: (B) Seminiferous tubules → Rete testis → Vasa efferentia → Epididymis → Vas deferens → Ejaculatory duct → Urethra → Urethral meatus

Sperms pass from seminiferous tubules to the rete testis, then vasa efferentia, epididymis, vas deferens, ejaculatory duct and urethra, leaving through the urethral meatus. The inguinal canal is the passage the vas deferens takes through the abdominal wall, not a duct in the sequence.

26. Answer: (C) (a)-(iii), (b)-(iv), (c)-(i), (d)-(ii)

Per NCERT, Homo habilis had a brain of 650–800 cc, Homo erectus about 900 cc, Neanderthal man about 1400 cc and modern Homo sapiens about 1350 cc. The trap is assuming modern humans have the largest brain; Neanderthals had a slightly larger one.

27. Answer: (B) random and directionless

De Vries described mutations as large, sudden, random and directionless, in contrast to Darwin's small, directional variations. 'Small' describes Darwinian variation, not mutation.

28. Answer: (C) Lysosomes and Vacuoles

Lysosomes and vacuoles are single-membrane bound organelles without their own DNA. Mitochondria and chloroplasts are semi-autonomous and carry their own circular DNA, so any pair containing them is wrong.

29. Answer: (B) inflammation of bronchi and bronchioles.

Asthma, triggered by allergens and pollutants, is difficulty in breathing with wheezing due to inflammation of bronchi and bronchioles. Fibrosis and alveolar wall damage describe occupational lung disease and emphysema respectively.

30. Answer: (C) In domesticated fowls, sex of progeny depends on the type of sperm rather than egg.

Birds show ZW–ZZ sex determination: females (ZW) are heterogametic, so the sex of the chick depends on the egg, not the sperm. Male Drosophila are XY, male grasshoppers are XO (half the sperms lack an X), and the human Y is much shorter than the X.

31. Answer: (B) Chilled ethanol

In the NCERT protocol, purified DNA is precipitated by adding chilled ethanol and appears as fine threads. Chloroform is used to remove proteins, not to precipitate DNA.

32. Answer: (B) Trichoderma, Baculovirus, Bacillus thuringiensis

Trichoderma (fungal biocontrol of plant pathogens), baculoviruses (insect pathogens) and Bacillus thuringiensis (Bt toxin against caterpillars) are all biocontrol agents. Tobacco mosaic virus and aphids are plant pests, while Rhizobium, Nostoc and Azospirillum are biofertilisers.

33. Answer: (B) (a)-(ii), (b)-(iv), (c)-(iii), (d)-(v)

Lactobacillus converts milk to curd, Saccharomyces cerevisiae (baker's yeast) leavens bread, Aspergillus niger produces citric acid and Acetobacter aceti produces acetic acid. Swapping citric and acetic acid between the fungus and the bacterium is the common error.

34. Answer: (D) Bi-directional

Phloem moves sugars from source to sink, and since sources and sinks change with season, translocation can be upward or downward, i.e. bidirectional. Xylem flow, by contrast, is unidirectional upward.

35. Answer: (D) Parthenogenesis

Development of an embryo from the female gamete without fertilisation is parthenogenesis. Parthenocarpy is development of a fruit without fertilisation, and syngamy is the fusion of gametes itself.

36. Answer: (B) Perisperm

Residual, persistent nucellus in seeds such as black pepper and beet is called perisperm. Tegmen is the inner seed coat and hilum is the scar where the seed was attached to the stalk.

37. Answer: (C) A unit of distance between genes on chromosomes, representing 1% cross over.

One centimorgan (map unit) is the distance between genes on a chromosome that gives 1% recombination (crossing over). 50% recombination is the maximum and indicates unlinked genes.

38. Answer: (C) 100 beats per minute

Stroke volume = end-diastolic volume – end-systolic volume = 100 – 50 = 50 mL. Heart rate = cardiac output ÷ stroke volume = 5000 mL ÷ 50 mL = 100 beats per minute. Using the 72 beats/min resting value or dividing by 100 mL gives the wrong answer.

39. Answer: (B) Maintaining hyperosmolarity towards inner medullary interstitium in the kidneys.

The counter-current mechanism keeps the medullary interstitium increasingly hyperosmotic towards the inner medulla, which draws water out of the collecting duct and concentrates urine. Low ADH levels do the opposite and produce dilute urine.

40. Answer: (B) Enzymes of electron transport are embedded in outer membrane.

The electron transport chain enzymes are located in the inner mitochondrial membrane (on the cristae), not the outer membrane. The outer membrane is porous, the inner membrane forms cristae, and the matrix holds circular DNA and 70S ribosomes.

41. Answer: (D) Water, mineral salts, some organic nitrogen and hormones

Xylem carries water and minerals, and also some organic nitrogen and hormones such as cytokinins from the root to the shoot. The options with 'only' leave out these organic solutes.

42. Answer: (A) exit the cell cycle

Cells that stop dividing exit G₁ and enter the inactive G₀ (quiescent) stage, where they stay metabolically active but no longer proliferate unless called on. They have not entered or permanently ended the cycle; NCERT describes this as exiting.

43. Answer: (D) Annual rings are not prominent in trees of temperate region.

Annual rings are prominent in temperate trees because the cambium is very active in spring and less active in autumn, producing distinct bands; they are indistinct in tropical trees. The other statements about spring/autumn wood and climatic control of cambium are correct.

44. Answer: (D) Pyramid of biomass in a sea

In the sea the standing biomass of phytoplankton is far smaller than that of the fish feeding on them, so the pyramid of biomass is inverted. The pyramid of energy can never be inverted, and the grassland pyramid of numbers is upright.

45. Answer: (C) Parietal

In parietal placentation (e.g. mustard, Argemone) ovules develop on the inner wall of the ovary or its peripheral part. In axile placentation ovules sit on a central axis in a multilocular ovary, and in free central they sit on a central axis without septa.

46. Answer: (A) Montreal Protocol

The Montreal Protocol (1987) was signed to control emission of ozone-depleting substances such as CFCs. The Kyoto Protocol deals with greenhouse gases causing global warming.

47. Answer: (A) 1500 mL

Expiratory capacity = tidal volume + expiratory reserve volume = 500 + 1000 = 1500 mL. Residual volume is not part of it; adding it gives 2700 mL, which is the trap (that sum would be functional residual capacity plus tidal volume).

48. Answer: (D) One fuses with the egg and other fuses with central cell nuclei.

In double fertilisation one male gamete fuses with the egg (syngamy) and the other fuses with the two polar nuclei of the central cell (triple fusion) to form the primary endosperm nucleus. Neither gamete fuses with a synergid nucleus.

49. Answer: (D) Leaves

Leaves perceive the photoperiod and send a floral stimulus to the shoot apex, where flowers form. The shoot apex is the site of flowering, not of perception.

50. Answer: (B) *Mangifera indica* Linn.

The binomial is written with a capital genus and small-letter specific epithet, followed by the abbreviated author name 'Linn.' when Linnaeus described it. Capitalising 'Indica' breaks the rule, and leaving out the author does not show who first described it.

51. Answer: (B) The enzyme binds DNA at specific sites and cuts only one of the two strands.

A restriction endonuclease recognises a specific palindromic sequence and cuts the sugar-phosphate backbone of both strands at specific positions, so the claim that it cuts only one of the two strands is the incorrect statement. Cutting at an identified position within the DNA is exactly what an endonuclease does, so that statement is correct.

52. Answer: (D) Law of Segregation does not apply in this experiment.

In incomplete dominance the alleles still segregate during gamete formation, which is why the F_2 shows a 1 red : 2 pink : 1 white ratio; so saying the law of segregation does not apply is incorrect. Only the principle of dominance fails here, because the heterozygote is intermediate.

53. Answer: (B) Hexokinase

Hexokinase phosphorylates glucose to glucose-6-phosphate using ATP. Phosphofructokinase catalyses the later phosphorylation of fructose-6-phosphate to fructose-1,6-bisphosphate.

54. Answer: (B) acetylation of morphine

Heroin (smack) is diacetylmorphine, obtained by acetylation of morphine extracted from the poppy plant. Glycosylation adds sugar groups and does not produce heroin.

55. Answer: (C) Progestasert, LNG-20

Progestasert and LNG-20 release progestogen into the uterus. Multiload 375 is a copper-releasing IUD, Lippes loop is non-medicated, and vaults are barrier devices.

56. Answer: (C) 0.16 (AA); 0.48 (Aa); 0.36 (aa)

$p = 0.4$ so $q = 0.6$. By Hardy-Weinberg, $AA = p^2 = 0.16$, $Aa = 2pq = 2 \times 0.4 \times 0.6 = 0.48$ and $aa = q^2 = 0.36$. Forgetting the factor 2 in $2pq$ gives 0.24, the main trap.

57. Answer: (A) It is Vitamin A enriched, with a gene from daffodil.

Golden rice is a transgenic rice enriched in β -carotene, the precursor of vitamin A; the original version carried a phytoene synthase gene from daffodil. Pest resistance with a Bt gene describes Bt crops, not golden rice.

58. Answer: (B) it has obligate association with mycorrhizae.

Pinus has an obligate association with mycorrhizal fungi; its seeds do not germinate and establish without them. An immature embryo or hard seed coat would cause dormancy but would not explain the need for a fungus.

59. Answer: (C) Genetic code is nearly universal

Because the genetic code is nearly universal, a bacterium reads the codons of the human insulin gene the same way a human cell does and makes the same polypeptide. Redundancy (degeneracy) and specificity are real features but do not explain expression across species.

60. Answer: (C) Infective constituent in viruses is the protein coat.

The infective part of a virus is its nucleic acid (DNA or RNA); the protein coat (capsid) only protects it. Viroids are naked RNA without a protein coat, and prions are abnormally folded proteins.

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

Pila, a mollusc, has a rasping radula; *Bombyx*, an insect, excretes by Malpighian tubules; *Pleurobrachia*, a ctenophore, swims with comb plates; and *Taenia*, a flatworm, has flame cells. Giving comb plates to the silkworm is the main mix-up.

62. Answer: (A) Genes expressed as RNA

In the Human Genome Project, ESTs identified all the genes that are expressed as RNA. Sequence annotation, the other approach, sequenced the whole genome including non-coding parts.

63. Answer: (D) Yeasts have filamentous bodies with long thread-like hyphae.

Yeasts are unicellular fungi without hyphae, so describing them as filamentous is wrong. Morels and truffles are edible ascomycetes, *Claviceps* yields ergot alkaloids and LSD, and conidia are exogenous while ascospores form inside asci.

64. Answer: (D) (a)-(ii), (b)-(iii), (c)-(iv), (d)-(i)

Saprophytes decompose dead organic matter, parasites live on living plants or animals, lichens are algae-fungus associations and mycorrhizae are fungus-root associations. Swapping lichens and mycorrhiza is the usual trap.

65. Answer: (D) GLUT IV

GLUT4, found in skeletal muscle and adipose tissue, is moved to the cell membrane in response to insulin, making glucose uptake there insulin-dependent. GLUT1, GLUT2 and GLUT3 transport glucose independently of insulin.

66. Answer: (D) Cell-mediated immune response

Graft rejection is due to cell-mediated immunity, in which T-lymphocytes recognise the graft as non-self. Humoral immunity works through antibodies and is not the main cause of graft rejection.

67. Answer: (C) (c) and (d) are correct

A dialyser removes urea and excess K^+ from blood, so nitrogenous waste and potassium do not build up. It cannot do the endocrine work of the kidney: no erythropoietin, so RBC production falls, and no activation of vitamin D (calcitriol), so calcium absorption from the gut falls.

68. Answer: (C) Alfred Sturtevant

Alfred Sturtevant, Morgan's student, used the frequency of recombination between gene pairs on the same chromosome as a measure of distance and mapped genes. Morgan discovered linkage and coined the term recombination but did not build the map.

69. Answer: (C) (a)-(iii), (b)-(i), (c)-(iv), (d)-(ii)

The i gene codes for the repressor, z for β -galactosidase, y for permease and a for transacetylase. Swapping the products of the y and a genes is the common error.

70. Answer: (A) Auxin and Ethylene

Auxins (such as NAA) induce flowering in pineapple, and ethylene also promotes synchronised flowering in pineapple. Abscissic acid is a growth inhibitor and would not promote flowering.

71. Answer: (B) Goblet Cells

Goblet cells secrete mucus, which lubricates the gut lining and protects it from digestive enzymes and acid. Chief cells secrete pepsinogen and oxyntic cells secrete HCl, which are the agents the lining needs protection from.

72. Answer: (A) Trichoderma

Trichoderma species are free-living fungi in root ecosystems that act against several plant pathogens. Anabaena is a nitrogen-fixing biofertiliser and Chlorella is a source of single cell protein.

73. Answer: (D) Both sieve tubes and companion cells

Gymnosperm phloem has sieve cells and albuminous cells but lacks both sieve tubes and companion cells. Saying it lacks only one of these leaves out the other.

74. Answer: (D) Deletion of GGU from 7th, 8th and 9th positions

The mRNA reads AAC AGC GGU GCU AUU; positions 7–9 form the whole codon GGU, so deleting them removes one amino acid and the downstream codons GCU AUU stay in frame. Inserting or deleting one or two bases shifts every codon after that point (frameshift).

75. Answer: (A) Rudolf Virchow

Rudolf Virchow (1855) explained that cells divide and new cells arise from pre-existing cells (Omnis cellula-e cellula), modifying the cell theory. Schleiden and Schwann proposed the original cell theory but could not explain how new cells form.

76. Answer: (C) Alkaline pH of gut

The inactive Bt protoxin crystals are solubilised and activated by the alkaline pH of the insect gut, after which the toxin binds midgut cells and creates pores. An acidic pH does not activate it, which is why it is harmless in the acidic human stomach.

77. Answer: (D) Salmonella typhi / Widal test

Typhoid is caused by Salmonella typhi and confirmed by the Widal test. The anthrone test detects carbohydrates, and Streptococcus pneumoniae causes pneumonia.

78. Answer: (B) Klinefelter's syndrome

Klinefelter's syndrome (47, XXY) gives overall masculine development with feminine features such as gynaecomastia, and the individuals are sterile. Turner's syndrome (45, XO) affects females.

79. Answer: (C) construction of roads

Polyblend, developed by Ahmed Khan in Bangalore, is mixed with bitumen to lay roads, increasing water repellence and road life. It is not used as a fertiliser or to make new plastic goods.

80. Answer: (D) Bury the waste within rocks deep below the Earth's surface

It is recommended that nuclear waste be pre-treated, stored in suitable shielded containers and buried within rocks about 500 m deep below the Earth's surface. Dumping under the ocean or Antarctic ice risks contaminating those ecosystems.

81. Answer: (C) (a)-(v), (b)-(iv), (c)-(i), (d)-(iii)

Insulin deficiency causes diabetes mellitus, thyroxine disorders cause goitre, deficient adrenal corticoids cause Addison's disease and excess growth hormone in adults causes acromegaly. Diabetes insipidus is due to ADH deficiency, not insulin.

82. Answer: (D) There are seven pairs of vertebrosteral, three pairs of vertebrochondral and two pairs of vertebral ribs.

Ribs 1-7 join the sternum directly (vertebrosteral), ribs 8-10 join the 7th rib through hyaline cartilage (vertebrochondral or false ribs) and ribs 11-12 are free ventrally (vertebral or floating ribs). So the 11th and 12th pairs are not connected to the sternum and not all ribs reach it.

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.