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NEET (UG) 2020 — Biology (Botany + Zoology)

Exam date: 13 September 2020 • Test Booklet Code: E1 • Questions 1–90 (90 questions, all compulsory) • +4 / –1

Questions as they appeared in NEET (UG) 2020 conducted by NTA. Answers per NTA final key. Explanations by competitorspoint.com.

Biology — Botany + Zoology (Q. 1–90, all compulsory; questions are mixed as in the original paper)

1. Which of the following is not an attribute of a population?

(1) Sex ratio **(2)** Natality
(3) Mortality **(4)** Species interaction

2. The process of growth is maximum during

(1) Log phase **(2)** Lag phase
(3) Senescence **(4)** Dormancy

3. The roots that originate from the base of the stem are

(1) Fibrous roots **(2)** Primary roots
(3) Prop roots **(4)** Lateral roots

4. Match the following diseases with the causative organism and select the correct option.

Column-I		Column-II	
(a)	Typhoid	**(i)**	Wuchereria
(b)	Pneumonia	**(ii)**	Plasmodium
(c)	Filariasis	**(iii)**	Salmonella
(d)	Malaria	**(iv)**	Haemophilus

(1) (a)-(i), (b)-(iii), (c)-(ii), (d)-(iv)
(2) (a)-(iii), (b)-(iv), (c)-(i), (d)-(ii)
(3) (a)-(ii), (b)-(i), (c)-(iii), (d)-(iv)
(4) (a)-(iv), (b)-(i), (c)-(ii), (d)-(iii)

5. In which of the following techniques, the embryos are transferred to assist those females who cannot conceive?

(1) ZIFT and IUT **(2)** GIFT and ZIFT
(3) ICSI and ZIFT **(4)** GIFT and ICSI

6. Identify the wrong statement with reference to the gene 'I' that controls ABO blood groups.

(1) The gene (I) has three alleles.
(2) A person will have only two of the three alleles.
(3) When I^A and I^B are present together, they express same type of sugar.
(4) Allele 'i' does not produce any sugar.

7. Choose the correct pair from the following

(1) Ligases - Join the two DNA molecules
(2) Polymerases - Break the DNA into fragments
(3) Nucleases - Separate the two strands of DNA
(4) Exonucleases - Make cuts at specific positions within DNA

8. Select the correct match

(1) Haemophilia – Y linked
(2) Phenylketonuria – Autosomal dominant trait
(3) Sickle cell anaemia – Autosomal recessive trait, chromosome-11
(4) Thalassemia – X linked

9. Match the following columns and select the correct option.

Column-I		Column-II	
(a)	Gregarious, polyphagous pest	**(i)**	Asterias
(b)	Adult with radial symmetry and larva with bilateral symmetry	**(ii)**	Scorpion
(c)	Book lungs	**(iii)**	Ctenoplana
(d)	Bioluminescence	**(iv)**	Locusta

(1) (a)-(i), (b)-(iii), (c)-(ii), (d)-(iv)
(2) (a)-(iv), (b)-(i), (c)-(ii), (d)-(iii)
(3) (a)-(iii), (b)-(ii), (c)-(i), (d)-(iv)
(4) (a)-(ii), (b)-(i), (c)-(iii), (d)-(iv)

10. The infectious stage of Plasmodium that enters the human body is

(1) Trophozoites **(2)** Sporozoites
(3) Female gametocytes **(4)** Male gametocytes

11. Identify the substances having glycosidic bond and peptide bond, respectively in their structure

(1) Chitin, cholesterol **(2)** Glycerol, trypsin
(3) Cellulose, lecithin **(4)** Inulin, insulin

12. The plant parts which consist of two generations – one within the other:

(a). Pollen grains inside the anther
(b). Germinated pollen grain with two male gametes
(c). Seed inside the fruit
(d). Embryo sac inside the ovule

(1) (a) only **(2)** (a), (b) and (c)
(3) (c) and (d) **(4)** (a) and (d)

13. The product(s) of reaction catalyzed by nitrogenase in root nodules of leguminous plants is/are

(1) Ammonia alone **(2)** Nitrate alone
(3) Ammonia and oxygen **(4)** Ammonia and hydrogen

14. Identify the correct statement with regard to G_1 phase (Gap 1) of interphase.

(1) DNA synthesis or replication takes place.
(2) Reorganisation of all cell components takes place.
(3) Cell is metabolically active, grows but does not replicate its DNA.
(4) Nuclear Division takes place.

15. Cuboidal epithelium with brush border of microvilli is found in

(1) Lining of intestine
(2) Ducts of salivary gland
(3) Proximal convoluted tubule of nephron
(4) Eustachian tube

16. Which of the following statements about inclusion bodies is incorrect?

(1) They are not bound by any membrane
(2) These are involved in ingestion of food particles
(3) They lie free in the cytoplasm
(4) These represent reserve material in cytoplasm

17. Which is the important site of formation of glycoproteins and glycolipids in eukaryotic cells?

(1) Endoplasmic reticulum **(2)** Peroxisomes
(3) Golgi bodies **(4)** Polysomes

18. In gel electrophoresis, separated DNA fragments can be visualized with the help of

(1) Acetocarmine in bright blue light
(2) Ethidium bromide in UV radiation
(3) Acetocarmine in UV radiation
(4) Ethidium bromide in infrared radiation

19. Identify the wrong statement with reference to transport of oxygen

(1) Binding of oxygen with haemoglobin is mainly related to partial pressure of O_2
(2) Partial pressure of CO_2 can interfere with O_2 binding with haemoglobin
(3) Higher H^+ conc. in alveoli favours the formation of oxyhaemoglobin
(4) Low pCO_2 in alveoli favours the formation of oxyhaemoglobin

20. Ray florets have

(1) Inferior ovary **(2)** Superior ovary
(3) Hypogynous ovary **(4)** Half inferior ovary

21. The specific palindromic sequence which is recognized by EcoRI is

(1) 5′ - GAATTC - 3′
3′ - CTTAAG - 5′
(2) 5′ - GGAACC - 3′
3′ - CCTTGG - 5′
(3) 5′ - CTTAAG - 3′
3′ - GAATTC - 5′
(4) 5′ - GGATCC - 3′
3′ - CCTAGG - 5′

22. Identify the wrong statement with regard to Restriction Enzymes.

(1) Each restriction enzyme functions by inspecting the length of a DNA sequence.
(2) They cut the strand of DNA at palindromic sites.
(3) They are useful in genetic engineering.
(4) Sticky ends can be joined by using DNA ligases.

23. Which of the following is put into Anaerobic sludge digester for further sewage treatment?

(1) Primary sludge
(2) Floating debris
(3) Effluents of primary treatment
(4) Activated sludge

24. Select the correct events that occur during inspiration.

(a). Contraction of diaphragm
(b). Contraction of external inter-costal muscles
(c). Pulmonary volume decreases
(d). Intra pulmonary pressure increases

(1) (a) and (b) **(2)** (c) and (d)
(3) (a), (b) and (d) **(4)** only (d)

25. If the head of cockroach is removed, it may live for few days because

(1) the supra-oesophageal ganglia of the cockroach are situated in ventral part of abdomen.
(2) the cockroach does not have nervous system.
(3) the head holds a small proportion of a nervous system while the rest is situated along the ventral part of its body.
(4) the head holds a 1/3 rd of a nervous system while the rest is situated along the dorsal part of its body.

26. Which of the following statements are true for the phylum-Chordata?

(a). In Urochordata notochord extends from head to tail and it is present throughout their life.
(b). In Vertebrata notochord is present during the embryonic period only.
(c). Central nervous system is dorsal and hollow.
(d). Chordata is divided into 3 subphyla : Hemichordata, Tunicata and Cephalochordata.

(1) (d) and (c) **(2)** (c) and (a)
(3) (a) and (b) **(4)** (b) and (c)

27. Match the organism with its use in biotechnology. Select the correct option from the following:

Column-I		Column-II	
(a)	Bacillus thuringiensis	**(i)**	Cloning vector
(b)	Thermus aquaticus	**(ii)**	Construction of first rDNA molecule
(c)	Agrobacterium tumefaciens	**(iii)**	DNA polymerase
(d)	Salmonella typhimurium	**(iv)**	Cry proteins

(1) (a)-(ii), (b)-(iv), (c)-(iii), (d)-(i)
(2) (a)-(iv), (b)-(iii), (c)-(i), (d)-(ii)
(3) (a)-(iii), (b)-(ii), (c)-(iv), (d)-(i)
(4) (a)-(iii), (b)-(iv), (c)-(i), (d)-(ii)

28. Match the following concerning essential elements and their functions in plants. Select the correct option.

Column-I		Column-II	
(a)	Iron	**(i)**	Photolysis of water
(b)	Zinc	**(ii)**	Pollen germination
(c)	Boron	**(iii)**	Required for chlorophyll biosynthesis
(d)	Manganese	**(iv)**	IAA biosynthesis

(1) (a)-(ii), (b)-(i), (c)-(iv), (d)-(iii)
(2) (a)-(iv), (b)-(iii), (c)-(ii), (d)-(i)
(3) (a)-(iii), (b)-(iv), (c)-(ii), (d)-(i)
(4) (a)-(iv), (b)-(i), (c)-(ii), (d)-(iii)

29. Identify the incorrect statement.

(1) Heart wood does not conduct water but gives mechanical support
(2) Sapwood is involved in conduction of water and minerals from root to leaf
(3) Sapwood is the innermost secondary xylem and is lighter in colour
(4) Due to deposition of tannins, resins, oils etc., heart wood is dark in colour

30. Match the following. Choose the correct option from the following.

Column-I		Column-II	
(a)	Inhibitor of catalytic activity	**(i)**	Ricin
(b)	Possess peptide bonds	**(ii)**	Malonate
(c)	Cell wall material in fungi	**(iii)**	Chitin
(d)	Secondary metabolite	**(iv)**	Collagen

(1) (a)-(ii), (b)-(iv), (c)-(iii), (d)-(i)
(2) (a)-(iii), (b)-(i), (c)-(iv), (d)-(ii)
(3) (a)-(iii), (b)-(iv), (c)-(i), (d)-(ii)
(4) (a)-(ii), (b)-(iii), (c)-(i), (d)-(iv)

31. Meiotic division of the secondary oocyte is completed

(1) Prior to ovulation
(2) At the time of copulation
(3) After zygote formation
(4) At the time of fusion of a sperm with an ovum

32. According to Robert May, the global species diversity is about

(1) 1.5 million **(2)** 20 million
(3) 50 million **(4)** 7 million

33. The first phase of translation is

(1) Binding of mRNA to ribosome
(2) Recognition of DNA molecule
(3) Aminoacylation of tRNA
(4) Recognition of an anti-codon

34. Which of the following regions of the globe exhibits highest species diversity?

(1) Western Ghats of India **(2)** Madagascar
(3) Himalayas **(4)** Amazon forests

35. Which of the following statements is not correct?

(1) In man insulin is synthesised as a proinsulin
(2) The proinsulin has an extra peptide called C-peptide.
(3) The functional insulin has A and B chains linked together by hydrogen bonds.
(4) Genetically engineered insulin is produced in E. coli.

36. The transverse section of a plant shows following anatomical features :

(a). Large number of scattered vascular bundles surrounded by bundle sheath
(b). Large conspicuous parenchymatous ground tissue
(c). Vascular bundles conjoint and closed
(d). Phloem parenchyma absent

Identify the category of plant and its part :

(1) Monocotyledonous stem **(2)** Monocotyledonous root
(3) Dicotyledonous stem **(4)** Dicotyledonous root

37. Match the following columns and select the correct option.

Column-I		Column-II	
(a)	6–15 pairs of gill slits	**(i)**	Trygon
(b)	Heterocercal caudal fin	**(ii)**	Cyclostomes
(c)	Air Bladder	**(iii)**	Chondrichthyes
(d)	Poison sting	**(iv)**	Osteichthyes

(1) (a)-(ii), (b)-(iii), (c)-(iv), (d)-(i)
(2) (a)-(iii), (b)-(iv), (c)-(i), (d)-(ii)
(3) (a)-(iv), (b)-(ii), (c)-(iii), (d)-(i)
(4) (a)-(i), (b)-(iv), (c)-(iii), (d)-(ii)

38. From his experiments, S.L. Miller produced amino acids by mixing the following in a closed flask

(1) CH_4, H_2, NH_3 and water vapor at 800°C
(2) CH_3, H_2, NH_4 and water vapor at 800°C
(3) CH_4, H_2, NH_3 and water vapor at 600°C
(4) CH_3, H_2, NH_3 and water vapor at 600°C

39. Embryological support for evolution was disapproved by

(1) Karl Ernst von Baer **(2)** Alfred Wallace
(3) Charles Darwin **(4)** Oparin

40. The process responsible for facilitating loss of water in liquid form from the tip of grass blades at night and in early morning is

(1) Transpiration **(2)** Root pressure
(3) Imbibition **(4)** Plasmolysis

41. Secondary metabolites such as nicotine, strychnine and caffeine are produced by plants for their

(1) Nutritive value **(2)** Growth response
(3) Defence action **(4)** Effect on reproduction

42. The oxygenation activity of RuBisCo enzyme in photorespiration leads to the formation of

(1) 2 molecules of 3-C compound
(2) 1 molecule of 3-C compound
(3) 1 molecule of 6-C compound
(4) 1 molecule of 4-C compound and 1 molecule of 2-C compound

43. Bt cotton variety that was developed by the introduction of toxin gene of Bacillus thuringiensis (Bt) is resistant to

(1) Insect pests **(2)** Fungal diseases
(3) Plant nematodes **(4)** Insect predators

44. Which of the following refer to correct example(s) of organisms which have evolved due to changes in environment brought about by anthropogenic action?

(a). Darwin's Finches of Galapagos islands.
(b). Herbicide resistant weeds.
(c). Drug resistant eukaryotes.
(d). Man-created breeds of domesticated animals like dogs.

(1) only (a) **(2)** (a) and (c)
(3) (b), (c) and (d) **(4)** only (d)

45. Identify the wrong statement with reference to immunity.

(1) When exposed to antigen (living or dead) antibodies are produced in the host's body. It is called "Active immunity".
(2) When ready-made antibodies are directly given, it is called "Passive immunity".
(3) Active immunity is quick and gives full response.
(4) Foetus receives some antibodies from mother, it is an example for passive immunity.

46. By which method was a new breed 'Hisardale' of sheep formed by using Bikaneri ewes and Marino rams?

(1) Out crossing **(2)** Mutational breeding
(3) Cross breeding **(4)** Inbreeding

47. Identify the correct statement with reference to human digestive system.

(1) Ileum opens into small intestine
(2) Serosa is the innermost layer of the alimentary canal
(3) Ileum is a highly coiled part
(4) Vermiform appendix arises from duodenum

48. Match the following columns and select the correct option.

Column-I		Column-II	
(a)	Clostridium butylicum	**(i)**	Cyclosporin-A
(b)	Trichoderma polysporum	**(ii)**	Butyric acid
(c)	Monascus purpureus	**(iii)**	Citric acid
(d)	Aspergillus niger	**(iv)**	Blood cholesterol lowering agent

(1) (a)-(iii), (b)-(iv), (c)-(ii), (d)-(i)
(2) (a)-(ii), (b)-(i), (c)-(iv), (d)-(iii)
(3) (a)-(i), (b)-(ii), (c)-(iv), (d)-(iii)
(4) (a)-(iv), (b)-(iii), (c)-(ii), (d)-(i)

49. Presence of which of the following conditions in urine are indicative of Diabetes Mellitus?

(1) Uremia and Ketonuria
(2) Uremia and Renal Calculi
(3) Ketonuria and Glycosuria
(4) Renal calculi and Hyperglycaemia

50. Floridean starch has structure similar to

(1) Starch and cellulose
(2) Amylopectin and glycogen
(3) Mannitol and algin
(4) Laminarin and cellulose

51. Select the option including all sexually transmitted diseases.

(1) Gonorrhoea, Syphilis, Genital herpes
(2) Gonorrhoea, Malaria, Genital herpes
(3) AIDS, Malaria, Filaria
(4) Cancer, AIDS, Syphilis

52. Match the following with respect to meiosis. Select the correct option from the following.

Column-I		Column-II	
(a)	Zygotene	**(i)**	Terminalization
(b)	Pachytene	**(ii)**	Chiasmata
(c)	Diplotene	**(iii)**	Crossing over
(d)	Diakinesis	**(iv)**	Synapsis

(1) (a)-(iii), (b)-(iv), (c)-(i), (d)-(ii)
(2) (a)-(iv), (b)-(iii), (c)-(ii), (d)-(i)
(3) (a)-(i), (b)-(ii), (c)-(iv), (d)-(iii)
(4) (a)-(ii), (b)-(iv), (c)-(iii), (d)-(i)

53. Which of the following pairs is of unicellular algae?

(1) Laminaria and Sargassum
(2) Gelidium and Gracilaria
(3) Anabaena and Volvox
(4) Chlorella and Spirulina

54. Which of the following hormone levels will cause release of ovum (ovulation) from the Graafian follicle?

(1) High concentration of Estrogen
(2) High concentration of Progesterone
(3) Low concentration of LH
(4) Low concentration of FSH

55. Match the following columns and select the correct option.

Column-I		Column-II	
(a)	Bt cotton	**(i)**	Gene therapy
(b)	Adenosine deaminase deficiency	**(ii)**	Cellular defence
(c)	RNAi	**(iii)**	Detection of HIV infection
(d)	PCR	**(iv)**	Bacillus thuringiensis

(1) (a)-(iv), (b)-(i), (c)-(ii), (d)-(iii)
(2) (a)-(iii), (b)-(ii), (c)-(i), (d)-(iv)
(3) (a)-(ii), (b)-(iii), (c)-(iv), (d)-(i)
(4) (a)-(i), (b)-(ii), (c)-(iii), (d)-(iv)

56. Montreal protocol was signed in 1987 for control of

(1) Transport of Genetically modified organisms from one country to another
(2) Emission of ozone depleting substances
(3) Release of Green House gases
(4) Disposal of e-wastes

57. Which of the following is correct about viroids?

(1) They have RNA with protein coat
(2) They have free RNA without protein coat
(3) They have DNA with protein coat
(4) They have free DNA without protein coat

58. The ovary is half inferior in :

(1) Brinjal
(2) Mustard
(3) Sunflower
(4) Plum

59. The enzyme enterokinase helps in conversion of

(1) protein into polypeptides
(2) trypsinogen into trypsin
(3) caseinogen into casein
(4) pepsinogen into pepsin

60. Match the trophic levels with their correct species examples in grassland ecosystem. Select the correct option.

Column-I		Column-II	
(a)	Fourth trophic level	**(i)**	Crow
(b)	Second trophic level	**(ii)**	Vulture
(c)	First trophic level	**(iii)**	Rabbit
(d)	Third trophic level	**(iv)**	Grass

(1) (a)-(ii), (b)-(iii), (c)-(iv), (d)-(i)
(2) (a)-(iii), (b)-(ii), (c)-(i), (d)-(iv)
(3) (a)-(iv), (b)-(iii), (c)-(ii), (d)-(i)
(4) (a)-(i), (b)-(ii), (c)-(iii), (d)-(iv)

61. How many true breeding pea plant varieties did Mendel select as pairs, which were similar except in one character with contrasting traits?

(1) 4 **(2)** 2
(3) 14 **(4)** 8

62. Match the following columns and select the correct option.

Column-I		Column-II	
(a)	Organ of Corti	**(i)**	Connects middle ear and pharynx
(b)	Cochlea	**(ii)**	Coiled part of the labyrinth
(c)	Eustachian tube	**(iii)**	Attached to the oval window
(d)	Stapes	**(iv)**	Located on the basilar membrane

(1) (a)-(ii), (b)-(iii), (c)-(i), (d)-(iv)
(2) (a)-(iii), (b)-(i), (c)-(iv), (d)-(ii)
(3) (a)-(iv), (b)-(ii), (c)-(i), (d)-(iii)
(4) (a)-(i), (b)-(ii), (c)-(iv), (d)-(iii)

63. In water hyacinth and water lily, pollination takes place by :

(1) Insects or wind **(2)** Water currents only
(3) Wind and water **(4)** Insects and water

64. Name the plant growth regulator which upon spraying on sugarcane crop, increases the length of stem, thus increasing the yield of sugarcane crop.

(1) Cytokinin **(2)** Gibberellin
(3) Ethylene **(4)** Abscisic acid

65. In light reaction, plastoquinone facilitates the transfer of electrons from

(1) PS-II to $Cytb_6f$ complex **(2)** $Cytb_6f$ complex to PS-I
(3) PS-I to $NADP^+$ **(4)** PS-I to ATP synthase

66. Which of the following is not an inhibitory substance governing seed dormancy?

(1) Gibberellic acid **(2)** Abscisic acid
(3) Phenolic acid **(4)** Para-ascorbic acid

67. Name the enzyme that facilitates opening of DNA helix during transcription.

(1) DNA ligase **(2)** DNA helicase
(3) DNA polymerase **(4)** RNA polymerase

68. Which of the following would help in prevention of diuresis?

(1) More water reabsorption due to undersecretion of ADH
(2) Reabsorption of Na^+ and water from renal tubules due to aldosterone
(3) Atrial natriuretic factor causes vasoconstriction
(4) Decrease in secretion of renin by JG cells

69. In relation to Gross primary productivity and Net primary productivity of an ecosystem, which one of the following statements is correct?

(1) Gross primary productivity is always less than net primary productivity
(2) Gross primary productivity is always more than net primary productivity
(3) Gross primary productivity and Net primary productivity are one and same
(4) There is no relationship between Gross primary productivity and Net primary productivity

70. Match the following columns and select the correct option.

Column-I		Column-II	
(a)	Placenta	**(i)**	Androgens
(b)	Zona pellucida	**(ii)**	Human Chorionic Gonadotropin (hCG)
(c)	Bulbo-urethral glands	**(iii)**	Layer of the ovum
(d)	Leydig cells	**(iv)**	Lubrication of the penis

(1) (a)-(iv), (b)-(iii), (c)-(i), (d)-(ii)
(2) (a)-(i), (b)-(iv), (c)-(ii), (d)-(iii)
(3) (a)-(iii), (b)-(ii), (c)-(iv), (d)-(i)
(4) (a)-(ii), (b)-(iii), (c)-(iv), (d)-(i)

71. Strobili or cones are found in

(1) Salvinia **(2)** Pteris
(3) Marchantia **(4)** Equisetum

72. Some dividing cells exit the cell cycle and enter vegetative inactive stage. This is called quiescent stage (G_0). This process occurs at the end of

(1) M phase **(2)** G_1 phase
(3) S phase **(4)** G_2 phase

73. Flippers of Penguins and Dolphins are examples of

(1) Adaptive radiation **(2)** Convergent evolution
(3) Industrial melanism **(4)** Natural selection

74. If the distance between two consecutive base pairs is 0.34 nm and the total number of base pairs of a DNA double helix in a typical mammalian cell is 6.6×10^9 bp, then the length of the DNA is approximately

(1) 2.0 meters **(2)** 2.5 meters
(3) 2.2 meters **(4)** 2.7 meters

75. The QRS complex in a standard ECG represents

(1) Repolarisation of auricles
(2) Depolarisation of auricles
(3) Depolarisation of ventricles
(4) Repolarisation of ventricles

76. Match the following columns and select the correct option.

Column-I		Column-II	
(a)	Eosinophils	**(i)**	Immune response
(b)	Basophils	**(ii)**	Phagocytosis
(c)	Neutrophils	**(iii)**	Release histaminase, destructive enzymes
(d)	Lymphocytes	**(iv)**	Release granules containing histamine

(1) (a)-(iii), (b)-(iv), (c)-(ii), (d)-(i)
(2) (a)-(iv), (b)-(i), (c)-(ii), (d)-(iii)
(3) (a)-(i), (b)-(ii), (c)-(iv), (d)-(iii)
(4) (a)-(ii), (b)-(i), (c)-(iii), (d)-(iv)

77. Which of the following statements is correct?

(1) Adenine pairs with thymine through two H-bonds
(2) Adenine pairs with thymine through one H-bond
(3) Adenine pairs with thymine through three H-bonds
(4) Adenine does not pair with thymine

78. The sequence that controls the copy number of the linked DNA in the vector, is termed

(1) Selectable marker **(2)** Ori site
(3) Palindromic sequence **(4)** Recognition site

79. Identify the basic amino acid from the following.

(1) Tyrosine **(2)** Glutamic Acid
(3) Lysine **(4)** Valine

80. Match the following columns and select the correct option.

Column-I		Column-II	
(a)	Pituitary gland	**(i)**	Graves' disease
(b)	Thyroid gland	**(ii)**	Diabetes mellitus
(c)	Adrenal gland	**(iii)**	Diabetes insipidus
(d)	Pancreas	**(iv)**	Addison's disease

(1) (a)-(iv), (b)-(iii), (c)-(i), (d)-(ii)
(2) (a)-(iii), (b)-(ii), (c)-(i), (d)-(iv)
(3) (a)-(iii), (b)-(i), (c)-(iv), (d)-(ii)
(4) (a)-(ii), (b)-(i), (c)-(iv), (d)-(iii)

81. Select the correct statement.

(1) Glucocorticoids stimulate gluconeogenesis.
(2) Glucagon is associated with hypoglycemia.
(3) Insulin acts on pancreatic cells and adipocytes.
(4) Insulin is associated with hyperglycemia.

82. Which one of the following is the most abundant protein in the animals?

(1) Haemoglobin **(2)** Collagen
(3) Lectin **(4)** Insulin

83. Experimental verification of the chromosomal theory of inheritance was done by

(1) Mendel **(2)** Sutton
(3) Boveri **(4)** Morgan

84. Match the following columns and select the correct option.

Column-I		Column-II	
(a)	Floating ribs	**(i)**	Located between second and seventh ribs
(b)	Acromion	**(ii)**	Head of the humerus
(c)	Scapula	**(iii)**	Clavicle
(d)	Glenoid cavity	**(iv)**	Do not connect with the sternum

(1) (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)
(2) (a)-(i), (b)-(iii), (c)-(ii), (d)-(iv)
(3) (a)-(iii), (b)-(ii), (c)-(iv), (d)-(i)
(4) (a)-(iv), (b)-(iii), (c)-(i), (d)-(ii)

85. The number of substrate level phosphorylations in one turn of citric acid cycle is

(1) Zero **(2)** One
(3) Two **(4)** Three

86. Dissolution of the synaptonemal complex occurs during

(1) Pachytene **(2)** Zygotene
(3) Diplotene **(4)** Leptotene

87. Bilaterally symmetrical and acoelomate animals are exemplified by

(1) Ctenophora **(2)** Platyhelminthes
(3) Aschelminthes **(4)** Annelida

88. The body of the ovule is fused within the funicle at

(1) Hilum **(2)** Micropyle
(3) Nucellus **(4)** Chalaza

89. Goblet cells of alimentary canal are modified from

(1) Squamous epithelial cells **(2)** Columnar epithelial cells
(3) Chondrocytes **(4)** Compound epithelial cells

90. Snow-blindness in Antarctic region is due to

(1) Freezing of fluids in the eye by low temperature
(2) Inflammation of cornea due to high dose of UV-B radiation
(3) High reflection of light from snow
(4) Damage to retina caused by infra-red rays

Answer key & explanations

Questions as they appeared in NEET (UG) 2020 conducted by NTA. Answers per NTA final key. Explanations by competitorspoint.com. Answer key: NTA NEET (UG) 2020 final answer key (result declared 16.10.2020), Book E1. No questions were dropped or awarded as bonus for Q1–90.

1 – 4	**2** – 1	**3** – 1	**4** – 2	**5** – 1	**6** – 3	**7** – 1	**8** – 3	**9** – 2	**10** – 2
11 – 4	**12** – 4	**13** – 4	**14** – 3	**15** – 3	**16** – 2	**17** – 3	**18** – 2	**19** – 3	**20** – 1
21 – 1	**22** – 4	**23** – 4	**24** – 1	**25** – 3	**26** – 4	**27** – 2	**28** – 3	**29** – 3	**30** – 1
31 – 4	**32** – 4	**33** – 3	**34** – 4	**35** – 3	**36** – 1	**37** – 1	**38** – 1	**39** – 1	**40** – 2
41 – 3	**42** – 2	**43** – 1	**44** – 3	**45** – 3	**46** – 3	**47** – 3	**48** – 2	**49** – 3	**50** – 2
51 – 1	**52** – 2	**53** – 4	**54** – 1	**55** – 1	**56** – 2	**57** – 2	**58** – 4	**59** – 2	**60** – 1
61 – 3	**62** – 3	**63** – 1	**64** – 2	**65** – 1	**66** – 1	**67** – 4	**68** – 2	**69** – 2	**70** – 4
71 – 4	**72** – 2*	**73** – 2	**74** – 3	**75** – 3	**76** – 1	**77** – 1	**78** – 2	**79** – 3	**80** – 3
81 – 1	**82** – 2	**83** – 4	**84** – 4	**85** – 2	**86** – 3	**87** – 2	**88** – 1	**89** – 2	**90** – 2

1. **Ans (4)** Sex ratio, natality and mortality are population attributes; species interaction is a community-level property.

2. **Ans (1)** In the sigmoid growth curve, growth is fastest in the log (exponential) phase.

3. **Ans (1)** Fibrous roots arise from the base of the stem (e.g., wheat) after the primary root is short-lived.

4. **Ans (2)** Typhoid – Salmonella; pneumonia – Haemophilus; filariasis – Wuchereria; malaria – Plasmodium.

5. **Ans (1)** ZIFT transfers the zygote/early embryo (up to 8 blastomeres) into the fallopian tube and IUT transfers embryos (>8 blastomeres) into the uterus; GIFT transfers gametes and ICSI injects a sperm into the ovum.

6. **Ans (3)** I^A and I^B are co-dominant and produce different sugars, so statement (3) is wrong.

7. **Ans (1)** DNA ligase joins DNA fragments; polymerases synthesize DNA, nucleases cut DNA, and exonucleases remove nucleotides from the ends.

8. **Ans (3)** Sickle-cell anaemia is autosomal recessive (β-globin gene on chromosome 11); haemophilia is X-linked, PKU autosomal recessive and thalassemia autosomal.

9. **Ans (2)** Locusta – gregarious pest; Asterias – radial adult, bilateral larva; scorpion – book lungs; Ctenoplana – bioluminescence.

10. **Ans (2)** Sporozoites injected by the female Anopheles mosquito are the infective stage of Plasmodium.

11. **Ans (4)** Inulin is a fructose polymer (glycosidic bonds); insulin is a protein (peptide bonds).

12. **Ans (4)** A pollen grain inside the anther and an embryo sac inside the ovule are gametophytes held within sporophytic tissue.

13. **Ans (4)** Nitrogenase reduces N_2 to ammonia, releasing H_2 as a by-product.

14. **Ans (3)** In G_1 the cell is metabolically active and grows but does not replicate its DNA.

15. **Ans (3)** The PCT is lined by cuboidal epithelium with a brush border of microvilli.

16. **Ans (2)** Inclusion bodies are non-membrane-bound reserve materials lying free in the cytoplasm; they are not involved in ingesting food.

17. **Ans (3)** The Golgi apparatus is the main site of formation of glycoproteins and glycolipids.

18. **Ans (2)** DNA bands are stained with ethidium bromide and seen as orange bands under UV light.

19. **Ans (3)** High H^+ (low pH) favours dissociation of oxyhaemoglobin, not its formation; alveoli have low H^+ and pCO_2.

20. **Ans (1)** Ray florets of the sunflower family have an inferior ovary (epigynous).

21. **Ans (1)** EcoRI recognizes 5′-GAATTC-3′ / 3′-CTTAAG-5′.

22. **Ans (4)** Restriction endonucleases inspect DNA for a specific recognition sequence, not its length, so (1) is wrong.

23. **Ans (4)** Part of the activated sludge is pumped into anaerobic sludge digesters.

24. **Ans (1)** During inspiration the diaphragm and external intercostals contract; pulmonary volume increases and intrapulmonary pressure falls.

25. **Ans (3)** Most of the cockroach nervous system lies along the ventral body, so it can live for a few days without its head.

26. **Ans (4)** In vertebrates the notochord is present only in the embryo, and the CNS is dorsal and hollow; the urochordate notochord is only in the larval tail, and Hemichordata is not a chordate subphylum.

27. **Ans (2)** Bacillus thuringiensis – Cry proteins; Thermus aquaticus – Taq DNA polymerase; Agrobacterium tumefaciens – cloning vector (Ti plasmid); Salmonella typhimurium – first rDNA molecule.

28. **Ans (3)** Fe – chlorophyll biosynthesis; Zn – IAA (auxin) biosynthesis; B – pollen germination; Mn – photolysis of water.

29. **Ans (3)** Sapwood is the outer, peripheral secondary xylem, not the innermost.

30. **Ans (1)** Malonate – competitive inhibitor; collagen – peptide bonds; chitin – fungal cell wall; ricin – secondary metabolite.

31. **Ans (4)** The secondary oocyte completes meiosis II only when a sperm enters it (fusion of sperm with ovum).

32. **Ans (4)** Robert May estimated global species diversity at about 7 million.

33. **Ans (3)** The first phase of translation is aminoacylation (charging) of tRNA.

34. **Ans (4)** Amazonian rainforests have the highest species diversity on Earth.

35. **Ans (3)** The A and B chains of insulin are linked by disulphide bridges, not hydrogen bonds.

36. **Ans (1)** Scattered, conjoint, closed vascular bundles with a bundle sheath, a large ground tissue and no phloem parenchyma indicate a monocot stem.

37. **Ans (1)** 6–15 pairs of gill slits – cyclostomes; heterocercal fin – Chondrichthyes; air bladder – Osteichthyes; poison sting – Trygon.

38. **Ans (1)** Miller used CH_4, H_2, NH_3 and water vapour at 800°C with electric discharge.

39. **Ans (1)** Karl Ernst von Baer disproved the embryological support for evolution (the recapitulation idea).

40. **Ans (2)** Guttation, the loss of water drops at blade tips at night or early morning, is due to root pressure.

41. **Ans (3)** Secondary metabolites such as nicotine, strychnine and caffeine serve in plant defence.

42. **Ans (2)** RuBisCO oxygenase gives one molecule of PGA (3-C) and one of phosphoglycolate (2-C).

43. **Ans (1)** Bt toxin (Cry protein) makes Bt cotton resistant to insect pests such as bollworms.

44. **Ans (3)** Herbicide-resistant weeds, drug-resistant eukaryotes and dog breeds result from human activity; Darwin's finches arose by natural adaptive radiation.

45. **Ans (3)** Active immunity is slow and takes time to give its full response; passive immunity is quick.

46. **Ans (3)** Hisardale was developed by cross-breeding Bikaneri ewes with Marino rams.

47. **Ans (3)** The ileum is the highly coiled part of the small intestine; it opens into the large intestine, the serosa is outermost and the appendix arises from the caecum.

48. **Ans (2)** Clostridium butylicum – butyric acid; Trichoderma polysporum – cyclosporin A; Monascus purpureus – statins; Aspergillus niger – citric acid.

49. **Ans (3)** Ketonuria and glycosuria are indicative of diabetes mellitus.

50. **Ans (2)** Floridean starch of red algae resembles amylopectin and glycogen.

51. **Ans (1)** Gonorrhoea, syphilis and genital herpes are all STIs; malaria, filaria and cancer are not.

52. **Ans (2)** Zygotene – synapsis; pachytene – crossing over; diplotene – chiasmata; diakinesis – terminalisation.

53. **Ans (4)** Chlorella and Spirulina are unicellular (single-cell protein sources).

54. **Ans (1)** A high estrogen level triggers the LH surge that causes ovulation, so (1) is the best choice.

55. **Ans (1)** Bt cotton – Bacillus thuringiensis; ADA deficiency – gene therapy; RNAi – cellular defence; PCR – detection of HIV.

56. **Ans (2)** The Montreal Protocol (1987) controls emission of ozone-depleting substances.

57. **Ans (2)** Viroids are free RNA without a protein coat.

58. **Ans (4)** Plum has a perigynous flower with a half-inferior ovary.

59. **Ans (2)** Enterokinase converts trypsinogen into active trypsin.

60. **Ans (1)** Grass – first trophic level, rabbit – second, crow – third, vulture – fourth.

61. **Ans (3)** Mendel selected 14 true-breeding varieties, i.e., 7 pairs of contrasting traits.

62. **Ans (3)** Organ of Corti – basilar membrane; cochlea – coiled labyrinth; Eustachian tube – middle ear to pharynx; stapes – oval window.

63. **Ans (1)** In water hyacinth and water lily, flowers above the water are pollinated by insects or wind.

64. **Ans (2)** Gibberellin spray elongates sugarcane stems and increases yield.

65. **Ans (1)** Plastoquinone carries electrons from PS II to the cytochrome b_6f complex.

66. **Ans (1)** Gibberellic acid breaks dormancy; ABA, phenolic acid and para-ascorbic acid are inhibitors.

67. **Ans (4)** In transcription, RNA polymerase itself opens the DNA helix.

68. **Ans (2)** Aldosterone promotes Na^+ and water reabsorption, which reduces urine output (prevents diuresis).

69. **Ans (2)** GPP minus respiration losses equals NPP, so GPP is always greater than NPP.

70. **Ans (4)** Placenta – hCG; zona pellucida – layer around the ovum; bulbo-urethral glands – lubrication of the penis; Leydig cells – androgens.

71. **Ans (4)** Equisetum bears compact strobili (cones).

72. **Ans (2)** [source copy prints (1); NTA final key gives (2)] Per NCERT, cells that do not divide further exit the G_1 phase to enter G_0.

73. **Ans (2)** Penguin and dolphin flippers are analogous structures, showing convergent evolution.

74. **Ans (3)** $6.6 \times 10^9 \times 0.34 \times 10^{-9}$ m $\approx$ 2.2 m.

75. **Ans (3)** The QRS complex shows depolarisation of the ventricles.

76. **Ans (1)** Eosinophils – histaminase and destructive enzymes; basophils – histamine granules; neutrophils – phagocytosis; lymphocytes – immune response.

77. **Ans (1)** A pairs with T through two hydrogen bonds; G≡C has three.

78. **Ans (2)** Ori (origin of replication) controls the copy number of linked DNA.

79. **Ans (3)** Lysine is a basic amino acid; glutamic acid is acidic, and valine and tyrosine are neutral.

80. **Ans (3)** Pituitary (ADH) – diabetes insipidus; thyroid – Graves' disease; adrenal – Addison's disease; pancreas – diabetes mellitus.

81. **Ans (1)** Glucocorticoids stimulate gluconeogenesis; glucagon causes hyperglycaemia and insulin hypoglycaemia.

82. **Ans (2)** Collagen is the most abundant protein in the animal world.

83. **Ans (4)** Morgan experimentally verified the chromosomal theory of inheritance (Drosophila).

84. **Ans (4)** Floating ribs – not attached to the sternum; acromion – clavicle; scapula – between the 2nd and 7th ribs; glenoid cavity – head of the humerus.

85. **Ans (2)** One substrate-level phosphorylation (succinyl-CoA → succinate, GTP) occurs per turn of the citric acid cycle.

86. **Ans (3)** The synaptonemal complex dissolves during diplotene.

87. **Ans (2)** Platyhelminthes are bilaterally symmetrical acoelomates.

88. **Ans (1)** The ovule body fuses with the funicle at the hilum.

89. **Ans (2)** Goblet cells are modified columnar epithelial cells.

90. **Ans (2)** Snow-blindness is inflammation of the cornea caused by high doses of UV-B.