1. What does the term key stone species imply?

(A) Species with a highest population in an ecosystem
(B) Species that play critical role in ecosystem balance
(C) Species that are exclusively top predators
(D) Species that contribute to nutrient cycling

2. The presence of analogous structures in different organisms indicate

(A) Divergent evolution
(B) Adaptive radiation
(C) Convergent evolution
(D) Homologous traits

3. Given below are some statements about Taq polymerase in PCR

(P) Taq polymerase prevents denaturation of DNA
(Q) Taq polymerase can withstand high temperatures required for DNA denaturation
(R) Taq polymerase inhibits non-specific amplification of DNA

Which among the above is/are TRUE?

(A) Only (P)
(B) Only (Q)
(C) (P) and (Q)
(D) (Q) and (R)

4. Which feature distinguishes gymnosperm from pteridophytes?

(A) Presence of vascular tissue
(B) Seed formation
(C) Chlorophyll pigments
(D) Dependence of water for fertilization

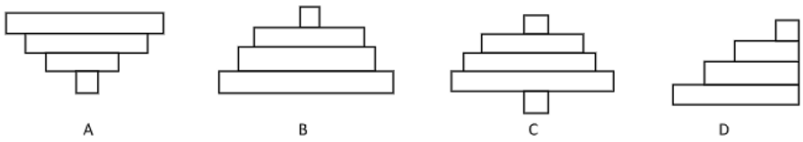
5. The Hardy-Weinberg principle is a foundational principle for understanding population genetics with several assumptions. Which of the following is NOT an assumption of this principle?

(A) Random mating
(B) Emigration of species
(C) Large population size
(D) Non-occurrence of mutations

6. By which of the following bonds, a nitrogenous base is linked to the pentose sugar?

(A) Phosphate bond
(B) Ester bond
(C) Peptide bond
(D) N-glycosidic bond

7. Which one of the following represents a pyramid of biomass?



(A) A and C
(B) A and D
(C) A and B
(D) B and C

8. Which one of the following is an example of recent extinction?

(A) Balearic cave goat
(B) Steller's Sea Cow
(C) Hunter Island Penguin
(D) Aurochs

9. Which one of the following is an example of a runner?

(A) *Lolium multiflorum*
(B) Narcissus
(C) *Bryophyllumdaigremontianum*
(D) Kalanchoe

10. 'Blue Body Syndrome' is caused due to …….

(A) Soil pollution
(B) Nitrate pollution
(C) Carbon pollution
(D) Zinc pollution

11. Why is photorespiration considered a wasteful process?

(A) It uses RuBisCO but does not generate ATP or NADPH
(B) It occurs only under high oxygen concentration
(C) It reduces the efficiency of glycolysis
(D) It releases stored glucose instead of producing it

12. The male gametes of rice plant have 12 chromosomes in their nucleus. The chromosome number in the female gamete, zygote and the cells of the seedling will be, respectively …….

(A) 12, 24, 12
(B) 24, 12, 12
(C) 12, 24, 24
(D) 24, 12, 24

13. Given below are some mass extinctions and their associated species

(P) The Mesozoic era is associated with the mass extinction of flowering plants
(Q) The Mesozoic era is associated with the mass extinction of trilobites
(R) The Mesozoic era is associated with the mass extinction of dinosaurs

Which among the above is/are TRUE?

(A) Only (P)
(B) Only (Q)
(C) Only (R)
(D) Both (P) and (R)

14. When two tall plants are crossed 45 tall plants and 14 dwarf plants are obtained. The genotype of parent plants is

(A) TT x TT
(B) TT x tt
(C) Tt x Tt
(D) TT x Tt

15. The holandric genes are located on

(A) Mitochondria
(B) X- chromosome
(C) Y-chromosome
(D) Polytene chromosome

16. Which gene produces permease in Lac operon?

(A) Z-gene
(B) A- gene
(C) Y-gene
(D) P-gene

17. RNA polymerizes which is on the promoter, moves to the structural genes to transcribe them. However, it happens when

(A) There is no repressor on the operator
(B) There is repressor on the operator
(C) Inducer binds to structural genes
(D) RNA polymerase shifts first to regulator gene

18. Pick out the CORRECT statement about the companion cells from the list below

(A) Companion cells are almost always adjacent to sieve tube elements
(B) Companion cells are present in all the vascular plants
(C) Companion cells are dead at maturity
(D) Companion cells lacking mitochondria and plastids

19. Sharp structures present on the surfaces of Rose plant is

(A) Thorn
(B) Spine
(C) Prickle
(D) Stolon

20. In the year ……..... Carolus Linnaeus used binomial nomenclature in Species Plantarum

(A) 1757
(B) 1753
(C) 1754
(D) 1738

21. The comma shaped bacterium is termed as ……

(A) Coccus
(B) Bacillus
(C) Vibrium
(D) Spirullum

22. The kingdom fungi include moulds, mushroom, yeast etc. Which of the following statements is/are TRUE about fungi?

(I) The web of hyphae is called mycelium
(II) The cell wall of fungi is composed of polysaccharides and chitin
(III) Some symbiont fungi live in association with roots of higher plants, as mycorrhiza
(IV) Most of the fungi are saprophytes and heterotrophic and coenocytic

Choose the answer

(A) I and II only
(B) I, II and III
(C) I, II, III and IV
(D) I, III and IV

23. The size of PPLO (pleuro-pneumonia like organisms) is

(A) 10-20 μm
(B) 1-2 μm
(C) 0.1 μm
(D) 0.02-0.2 μm

24. The percentage weight of Sulphur in human body is

(A) 0.03
(B) 0.3
(C) 2.8
(D) 3.3

25. The atrial wall of our heart secretes a very important peptide hormone called

(A) cholecystokinin
(B) erythropoietin
(C) atrial natriuretic factor
(D) secretin

26. Which of the following is diploid (2n)?

(A) Male gametophyte
(B) Endosperm
(C) Megaspore
(D) Microspore mother cell

27. Choose the CORRECTLY matched pair

(A) Xenogamy - Transfer of pollen grains from the anther to the stigma of another flower of the same plant
(B) Geitonogamy - Transfer of pollen grains from anther to the stigma of a different plant
(C) Primary endosperm nucleus - Diploid
(D) Albuminous seeds - have residual endosperms

28. Match the following (column I with column II)

	Column I		Column II
(I)	Asymmetrical	(a)	Aschelminthes
(II)	Pseudocoelomates	(b)	Porifera
(III)	Acoelomata	(c)	Platyhelminthes
(IV)	Coelomates	(d)	Arthropoda

(A) I (a), II (b), III (d), IV (c)
(B) I (b), II (a), III (c), IV (d)
(C) I (c), II (d), III (a), IV (b)
(D) I (d), II (c), III (b), IV (a)

29. The epidermal tissue system forms the outer-most covering of the whole plant body. Which of the following statements is WRONG about epidermal tissue system?

(A) Epidermal tissue system consists stomata, trichomes and hairs
(B) The epidermis is the outermost layer of the primary plant body
(C) Epidermal cells are parenchymatous with a high amount of cytoplasm and a small vacuole
(D) The outside of the epidermis is often covered with a waxy thick layer

30. Match the following (column I with column II)

	Column I		Column II
(I)	Protection against chemical and mechanical stresses	(a)	Endocrine glands
(II)	Secretion of digestive and enzymes	(b)	Squamous epithelium
(III)	Secretion of hormones	(c)	Compound epithelium
(IV)	Formation of diffusion boundary	(d)	Exocrine glands

(A) I (c), II (a), III (d), IV (b)
(B) I (c), II (d), III (a), IV (b)
(C) I (d), II (b), III (a), IV (c)
(D) I (a), II (b), III (d), IV (c)

31. Which of the following statements is FALSE about bones?

(A) Bones support and protect softer tissues and organs
(B) Bones have a hard and pliable ground substance rich in calcium salts and collagen fibres
(C) Limb bones, such as the long bones of the legs, serve weight-bearing functions
(D) The bone marrow in some bones is the site of production of blood cells.

32. In India, the noise was recognized as an air pollutant (Air Act) in

(A) 1981
(B) 1987
(C) 1986
(D) 1990

33. As per Euro III norms, sulphur content of petrol be controlled at

(A) 200 ppm
(B) 300 ppm
(C) 350 ppm
(D) 150 ppm

34. Which protocol was signed to control the emission of ozone-depleting substances?

(A) Nagoya Protocol
(B) Montreal Protocol
(C) Geneva Protocol
(D) Cartagena Protocol

35. The National Forest Policy (1988) of India has recommended …….forest cover for the plains and …….for the hills

(A) 30% and 70%
(B) 31% and 69%
(C) 33% and 67%
(D) 32% and 68%

36. Biodiversity is the term popularized by the sociobiologist Edward Wilson to describe the combined diversity at all the levels of biological organization. Choose CORRECT statement(s) about biodiversity

(I) Among animals, insects are the most species-rich taxonomic group, making up more than 70% of the total
(II) For many taxonomic groups, species inventories are more complete in temperate than in tropical countries
(III) A more conservative and scientifically sound estimate made by Robert May places the global species diversity at about 7 million
(IV) Nearly 45,000 species of plants and twice as many of animals have been recorded from India.

(A) I, II and III
(B) II and III
(C) I, II, III and IV
(D) II and IV

37. Which of the following statements is FALSE about biological community?

(A) A stable community should show too much variation in productivity from year to year
(B) The community must be either resistant or resilient to occasional disturbances
(C) It must also be resistant to invasions by alien species
(D) Community with rich diversity tends to associate with high productivity

38. World Summit on Sustainable Development held in …… in Johannesburg, South Africa

(A) 2004
(B) 2002
(C) 2006
(D) 2000

39. Which of the following statement is FALSE about productivity?

(A) Net primary productivity is the available biomass for the consumption to heterotrophs.
(B) Secondary productivity is defined as the rate of formation of new organic matter by consumers
(C) The annual net primary productivity of the whole biosphere is approximately 160 billion tons (dry weight) of organic matter
(D) The productivity of the oceans are only 55 billion tons

40. The Bt toxin protein exist as inactive *protoxins* but once an insect ingest the inactive toxin, it is converted into an active form of toxin due to the …….of the gut which solubilise the crystals

(A) Acidic pH
(B) Alkaline pH
(C) Neutral pH
(D) Microbiome

41. Choose the WRONG statement of Insulin

(A) Insulin used for diabetes was earlier extracted from livers of slaughtered cattle and pigs
(B) Insulin consists of two short polypeptide chains: chain A and chain B
(C) In mammals, including humans, insulin is synthesised as a pro-hormonewhich contains an extra stretch called the C peptide
(D) The main challenge for production of insulin using rDNA techniques was getting insulin assembled into a mature form

42. It was found that *Hind II* always cut DNA molecules at a particular point by recognizing a specific sequence of …….. pairs

(A) Four
(B) Eight
(C) Six
(D) Ten

43. The repeated amplification of DNA in polymerase chain reaction is achieved through the use of an enzyme. Select the source of enzyme

(A) Bacterium
(B) Fungus
(C) Insect
(D) Mollicutes

44. For the discovery of Penicillin, Fleming, Chain and Florey were awarded the Nobel Prize in

(A) 1947
(B) 1952
(C) 1945
(D) 1951

45. A bioactive molecule, cyclosporin A, that is used as an immunosuppressive agent in organ-transplant patients, is produced by the

(A) *Aspergillus niger*
(B) *Saccharomyces cerevisiae*
(C) *Trichoderma polysporum*
(D) *Monascus purpureus*

46. Mating of animals within the same breed (but having no common ancestors on either side of their pedigree up to 4-6 generations) is known as

(A) Out-breeding
(B) Out-crossing
(C) Cross-breeding
(D) Interspecific hybridization

47. *Sonalika* and *Kalyan Sona* are varieties of

(A) Wheat and Paddy, respectively
(B) Paddy and Wheat, respectively
(C) Both are wheat varieties
(D) Both are paddy varieties

48. Mucus coating of the epithelium lining the respiratory, gastrointestinal and urogenital tracts are known as …… barriers

(A) Physiological
(B) Cellular
(C) Physical
(D) Mechanical

49. Choose WRONG statement about Origin and Evolution of Man

(A) About 15 mya, primates called *Dryopithecus* and *Ramapithecus* were existing
(B) *Dryopithecus* and *Ramapithecus* were hairy and walked like gorillas and chimpanzees
(C) *Dryopithecus* was more man-like while *Ramapithecus* was more ape-like
(D) Few fossils of man-like bones have been discovered in Ethiopia and Tanzania

50. A plant with a genotype *Aa Bb* is crossed with a plant having the genotype*aa bb*. The genotype of F1 would be

(A) Aa Bb, AB AB
(B) aa bb, aa Bb
(C) BB aa, AA Bb
(D) Aa Bb, Aa bb, aB ab, ab ab

51. The Government of India legalised Medical Termination of Pregnancy (MTP) in

(A) 1961
(B) 1981
(C) 1971
(D) 1991

52. Which of the following sexually transmitted disease is caused by protozoa?

(A) Gonorrhoea
(B) Syphilis
(C) Genital warts
(D) Trichomoniasis

53. Secretions of bulbourethral glands constitute the seminal plasma which is rich in

(A) Sucrose and Potassium
(B) Glucose and Sodium
(C) Fructose and Calcium
(D) Mannose and Magnesium

54. Which of the following exhibits strong contraction during delivery of the baby?

(A) Perimetrium
(B) Endometrium
(C) Myometrium
(D) Ampulla

55. The glandular tissue of each breast is divided into ……. mammary lobes containing clusters of cells called alveoli

(A) 15-40
(B) 15-20
(C) 15-25
(D) 15-30

56. What are the diploid stages in gametogenesis?

(A) Spermatogonia and spermatia
(B) Spermatogonia and primary spermatocytes
(C) Spermatogonia and sperm
(D) Primary and secondary spermatocytes

57. A typical angiosperm anther is …….with each lobe having ……. theca

(A) bilobed, two
(B) tri lobed, two
(C) multilobed, four
(D) bilobed, four

58. In a typical angiosperm, the primary endosperm nucleus is

(A) Haploid
(B) Diploid
(C) Triploid
(D) Polyploid

59. Which of the following is a unisexual species?

(A) Sponge
(B) Tapeworm
(C) Cockroach
(D) Leech

60. Each statement in the taxonomical key is called

(A) couplet
(B) lead
(C) taxon
(D) choice

61. The main plant body of the bryophyte is

(A) Diploid
(B) Haploid
(C) Polyploid
(D) Tetraploid

62. Which of the following is completely heterosporous?

(A) Algae
(B) Bryophyte
(C) Pteridophyte
(D) Gymnosperm

63. Choose the pseudocoelomates from the list below

(A) Molluscs
(B) Arthropods
(C) Annelids
(D) Aschelminthes

64. Match the following (column I with column II)

Column I		Column II	
(I)	Vexillary	(a)	*Cassia*
(II)	Imbricate	(b)	Bean
(III)	Valvate	(c)	Cotton
(IV)	Twisted	(d)	*Calotropis*

(A) I (b), II (a), III (d), IV (c)
(B) I (a), II (d), III (b), IV (c)
(C) I (c), II (a), III (d), IV (b)
(D) I (a), II (c), III (b), IV (d)

65. In a kidney column of Bertini extends from

(A) Medulla to pelvis
(B) Medulla to cortex
(C) Cortex to medulla
(D) Pelvis to ureter

66. Very high number alveoli present in a lung is meant for

(A) More space for increasing volume of inspired air
(B) More area for diffusion
(C) Making the organ spongy
(D) Increasing nerve supply

67. Enterokinase takes part in conversion of

(A) Pepsinogen to pepsin
(B) Trypsinogen to trypsin
(C) Protein in to polypeptides
(D) Caseinogen to casein

68. The control of the medullary respiratory center is primarily under

(A) Nervous control
(B) Physical control
(C) Chemical control
(D) Electric control

69. Nitrogenous waste products are eliminated mainly as

(A) Urea in tadpole and ammonia in adult frog
(B) Ammonia in tadpole and urea in adult frog
(C) Urea in both tadpole and adult frog
(D) Ammonia in both tadpole and adult frog

70. Which of the following sets of ions is necessary for transmission of nerve impulse?

(A) *Na* and *K*
(B) *Ca* and *Na*
(C) *Ca* and *K*
(D) *Na* and *Mg*

71. A person wears convex lenses for proper vision. Without glasses the image of the object is produced

(A) On blind spot
(B) On yellow spot
(C) In front of retina
(D) Behind the retina

72. What would happen if *vasa deferentia* of man are cut?

(A) Sperms are non-nucleate
(B) Spermatogenesis does not occur
(C) Semen is without sperms
(D) Sperms are nonmotile

73. Which is urinary bladder of child in womb?

(A) Urinary bladder
(B) Liver
(C) Allantois
(D) Amnion

74. Which one does not involve osmosis?

(A) Water passing from one xylem element to the other above it
(B) Water moving from soil to root hair
(C) Water passing into mesophyll cell from xylem
(D) Water passing from root hair cell to cortical cell

75. Which of the following complex of photosynthetic electron transport is structurally and functionally similar to ubiquinone and cytochrome bc 1?

(A) FAD and Fe - S
(B) FMN and Fe -S
(C) Plastoqunione and cytochrome b_6f
(D) Plastocyanin and cytochrome b_6f

76. Which of the following is not a part of hindbrain?

(A) Pons
(B) Medulla
(C) Cerebellum
(D) Corpora Quadrigemina

77. An integral membrane protein that facilitates the simultaneous transport of two different molecules across the membrane in opposite directions

(A) Antiport
(B) Uniport
(C) Symport
(D) Cotransport

78. The Primary CO_2 acceptor of C_4 Pathway Photosynthesis is

(A) Phosphoenol Pyruvate
(B) Phosphoglyceric Acid
(C) Malate
(D) Oxaloacetic Acid

79. Which of the following statements are irrelevant to meiosis?

(i) Homologous chromosomes line up in pairs at the metaphase
(ii) Homologous chromosomes do not pair up to form bivalent
(iii) Chiasmata form and crossing over occurs
(iv) Daughter cells are genetically different
(v) Two daughter cells are formed

(A) (ii) and (v)
(B) (i) and (ii)
(C) (iii) and (v)
(D) (iv) and (iii)

80. A common feature of vessel elements and sieve tube elements

(A) Pores on lateral walls
(B) Presence of proteins
(C) Enucleate condition
(D) Thick secondary wall

81. *Camylo bacter* is a

(A) Aerophilic bacteria
(B) Capnophilic bacteria
(C) Halophilic bacteria
(D) Thermophilic bacteria

82. What is the net charge of a zwitterion molecule at its isoelectric point?

(A) 1
(B) -1
(C) 0
(D) None of the above

83. Isinglass is used in

(A) Preparation of wines
(B) Preservation of wines
(C) Distillation of wines
(D) Clearing of wines

84. Ten percent law was proposed by

(A) Raymond Lindeman
(B) Eugene Odum
(C) Arthur Tansley
(D) Charles Elton

85. A total contribution of CO_2 gas in global warming

(A) 60%
(B) 14%
(C) 20%
(D) 6%

86. An example of dioecious plant

(A) Chara
(B) Marchantia
(C) Maize
(D) Cucumber

87. The process by which transfer of pollen grains from the anther to the stigma of another flower of the same plant is known as

(A) Autogamy
(B) Syngamy
(C) Xenogamy
(D) Geitonogamy

88. In the female reproductive system, finger like projection of infundibulum is called

(A) Isthmus
(B) Ampulla
(C) Uterine fundus
(D) Fimbriae

89. The F_2 generation exhibits a phenotypic ratio of 1: 2: 1 in

(A) Incomplete dominance
(B) Co - dominance
(C) Test cross
(D) Monohybrid cross

90. Which of the following amino acid residues is responsible for positive charge of histone molecules?

(A) Histidine and Proline
(B) Glycine and Leucine
(C) Lysine and Arginine
(D) Alanine and Glutamine

Key					
SI No	Key	SI No	Key	SI No	Key
1	B	31	B	61	B
2	C	32	B	62	D
3	B	33	D	63	D
4	B	34	B	64	A
5	B	35	C	65	C
6	D	36	C	66	B
7	C	37	A	67	B
8	B	38	B	68	C
9	A	39	C	69	B
10	B	40	B	70	A
11	A	41	A	71	D
12	C	42	C	72	C
13	C	43	A	73	C
14	C	44	C	74	A
15	C	45	C	75	C
16	C	46	B	76	D
17	A	47	C	77	A
18	A	48	C	78	A
19	C	49	C	79	A
20	B	50	D	80	C
21	C	51	C	81	B
22	C	52	D	82	C
23	C	53	C	83	D
24	B	54	C	84	A
25	C	55	B	85	A
26	D	56	B	86	B
27	D	57	A	87	D
28	B	58	C	88	D
29	C	59	C	89	A
30	B	60	B	90	C