DAY FOUR

Unit Test 1
(Diversity in Living World)

1 The biological definition of a species depends on
I. the geographical distribution of two groups of organisms.
II. reproductive isolation of two groups of organisms.
III. anatomical and developmental differences between the two groups of organisms.
IV. difference in the adaptation of two groups of organisms.

Choose the correct statement(s).
(a) Only I (b) Only II (c) Only III (d) III and IV

2 Read the following statements and select the incorrect one.
(a) *Herdmania* and *Branchiostoma* belong to the classes Urochordata and Cephalochordata, respectively
(b) In cephalochordates, nerve cord is present with a distinct brain
(c) In sea urchin, masticatory apparatus formed by five strong and sharp teeth is called Aristotle lantern
(d) In coelenterates, mesoglea is present between ectoderm and endoderm

3 Which of the following are considered as the twin characteristic of growth?
(a) Response to stimuli
(b) Increase in mass
(c) Increase in the number of individuals
(d) Both (b) and (c)

4 Male *Scoliodon* can be distinguished from the female by the presence of
(a) typhlosole (b) book lungs (c) ommatidia (d) claspers

5 Numerical taxonomy is based on
(a) cytological studies
(b) biochemical studies
(c) experimental determination of genetical inter-relationship
(d) statistical methods

6 In molluscs, eye is present over a stalk called
(a) osphradium (b) ostracum
(c) ommatophore (d) operculum

7 Choose the incorrect statement regarding universal rules of nomenclature.
(a) The first word in a biological name represents the genus
(b) The first word denoting the genus starts with a capital letter
(c) Both the words in a biological name, when handwritten are separately underlined
(d) Biological names are generally in english and written in italics

8 Which of the following methods to establish phylogenetic relationships among organisms has been developed most recently?
(a) Comparing morphology (shape and structure)
(b) Comparing physiology (the functioning of structure and systems)
(c) Comparing the component sequences of proteins and nucleic acids
(d) Comparing behavioural patterns

9 Two plants can be conclusively said to belong to the same species if they
(a) can reproduce freely with each other and form seeds
(b) have more than 90% similar genes
(c) look similar and possess identical secondary metabolites
(d) have same number of chromosomes

10 Match the following columns.

	Column I		Column II
A.	Choanocytes	1.	Platyhelminthes
B.	Cnidoblasts	2.	Ctenophora
C.	Flame cells	3.	Porifera
D.	Nephridia	4.	Coelenterata
E.	Comb plates	5.	Annelida

Codes

	A	B	C	D	E
(a)	2	1	4	5	3
(b)	2	4	1	5	3
(c)	5	1	3	2	4
(d)	3	4	1	5	2

11 A taxon is a
(a) formal grouping at any given level
(b) formal grouping at any level from phylum to species
(c) clade
(d) species

12 Malpighian tubules are structures which are
(a) visual units in the compound eye of cockroach
(b) blood-filled cavity in molluscs
(c) visceral hump which secretes calcareous shells in molluscs
(d) excretory organs in cockroach

13 Which of the following statements are correct about tautonyms?
(a) Generic name different than species name
(b) Generic name repeated as specific name
(c) Generic name absent
(d) Generic name is written after species name

14 Which statement about prokaryotic fimbriae and pili is incorrect?
(a) They may assist prokaryotes in adhering to a substrate
(b) They may assist prokaryotes in adhering to each other
(c) They are more similar in structure to eukaryotic flagella than they are similar to prokaryotic flagella
(d) Specialised pili link prokaryotes during conjugation

15 The correct statements about taxon are
I. It is the taxonomic group of any rank.
II. It was first introduced by ICBN.
III. Linnaeus is the founder of taxon.
IV. Taxon term was used in *Systema Naturae*.
(a) I, II, and III (b) I and II (c) III and IV (d) I and III

16 Abundant internal membranes are present in
(a) photosynthetic bacteria
(b) Gram negative bacteria
(c) flagellated bacteria
(d) pathogenic bacteria

17 Match the following columns.

	Column I		Column II
A.	Classical taxonomy	1.	Old systematics
B.	Practical taxonomy	2.	Utility of organisms
C.	Natural taxonomy	3.	Evolutionary history of species
D.	Chemotaxonomy	4.	Natural similarities amongst organisms
		5.	The presence or absence of chemicals in cells or tissues

Codes

	A	B	C	D
(a)	1	2	3	4
(b)	2	3	4	5
(c)	5	4	3	2
(d)	1	2	4	5

18 In the life cycle of pteridophytes, prothallus represents
(a) the gametophytic phase (b) the sporophytic phase
(c) the neutral phase (d) no phase

19 Choose the correct statement from the options given below
(a) *Genera Plantarum* was written by John Ray
(b) Highest taxonomic category is divison
(c) A group of closely related species of organisms represents genus
(d) The term 'systematics' was coined by AP de Candolle

20 Which of the following depicts the correct function of botanical garden?
(a) One can observe tropical plants there
(b) They allow *ex situ* conservation of germplasm
(c) They provide the natural habitat for wildlife
(d) They provide a beautiful area for recreation

21 Match the following columns.

	Column I		Column II
A.	*Chlamydomonas*	1.	Moss
B.	*Cedrus*	2.	Pteridophyte
C.	*Psilotum*	3.	Algae
D.	*Sphagnum*	4.	Gymnosperm

Codes

	A	B	C	D
(a)	3	4	2	1
(b)	4	2	3	1
(c)	3	4	1	2
(d)	4	1	3	2

22 Which example given below is a correct statement about *Bacteroides thetaiotaomicron*, a bacterium that lives in the human intestines?
(a) The bacteria have a parasitic relationship with the human body
(b) The bacteria have a commensal relationship with the human body
(c) The bacteria have a mutualistic relationship with the human body
(d) The bacteria directly create a network of intestinal blood vessels necessary to absorb food

23 The main difference between Gram positive and Gram negative bacteria lies in
(a) flagella (b) cell walls
(c) pili (d) plasmids

24 Chloragogen cells or yellow cells of earthworm are analogous to
(a) vertebrate liver cells
(b) oral sucker in *Fasciola*
(c) nerve ring in *Ascaris*
(d) pedicellariae in *Asterias*

25 The biological concept of species was formulated by
(a) Mayr (b) Stebbins (c) Heywood (d) Darwin

26 Which of the following is not a characteristic of some archaea?
(a) The ability to produce methane from carbon dioxide
(b) The absence of a nuclear envelope
(c) The presence of a circular chromosome
(d) The presence of peptidoglycan

27 The circulatory system in cockroach is of open type and the heart is
(a) neurogenic
(b) myogenic
(c) neurogenic in adult stage only
(d) myogenic in adult stage only

28 Match the following columns.

	Column I		Column II
A.	Largest herbarium	1.	Indian Botanical Garden, Sibpur
B.	Largest botanical garden of Asia	2.	Pisa Botanical Garden, Italy
C.	First botanical garden	3.	Royal Botanical Garden, Kew
		4.	National Botanical Garden, Lucknow

Codes

	A	B	C		A	B	C
(a)	4	2	1	(b)	1	2	3
(c)	3	1	2	(d)	4	1	3

29 Rhabditiform is a term used for
(a) sensory cells in coelenterates
(b) primary host of *Fasciola hepatica*
(c) larva of *Ascaris*
(d) visual units in cockroach

30 Which of the following is not present in eukaryotic cells?
(a) Photosynthetic pigments
(b) Nucleoid with a circular chromosome
(c) Membrane enclosed organelles
(d) '9+2' arrangement of microtubules

31 Prokaryotes found inhabiting the great salt lake would be the
(a) cyanobacteria (b) extreme halophiles
(c) extremophiles (d) methanogens

32 Consider the following statements and choose the correct one.
(a) Biological classification is the scientific ordering of organisms in a hierarchical series of groups on the basis of their relationships, i.e. morphological, evolutionary and others
(b) Whittaker classified organisms on the basis of autotrophic and heterotrophic mode of nutrition
(c) In five kingdom system of classification, living organisms can be divided into prokaryotic and eukaryotic cells on the basis of cell structure
(d) All of the above

33 Respiratory enzymes occur in bacteria in
(a) plasma membrane
(b) mitochondria
(c) Golgi apparatus
(d) endoplasmic reticulum

34 What is the role of heterocysts in a cyanobacterial filament?
(a) They carry out photosynthesis and nitrogen-fixation
(b) They carry out only nitrogen-fixation
(c) They carry out only photosynthesis
(d) They oxidise inorganic substances to obtain energy

35 For which method of bioremediation would a methanogen most likely to be used?
(a) Extracting gold ore
(b) Decomposing waste in a sewage-treatment facility
(c) The production of transgenic plants
(d) The production of antibiotics

36 *Entamoeba histolylica* differs from *Amoeba* in not having
(a) nucleus
(b) contractile vacuole
(c) pseudopodia
(d) ectoplasm and endoplasm

37 Which of the following statements is true?
(a) All prokaryotic organisms were grouped together under kingdom–Monera
(b) The unicellular eukaryotic organisms were placed in kingdom–Protista
(c) *Paramecium* and *Amoeba* lack cell well
(d) All of the above

38 Choose the correct statement about class–Basidiomycetes
(a) Members may be found in soil, on logs and tree stumps and in living plants bodies
(b) Sexual reproduction involves sex organs
(c) The mycelium is branched and septate
(d) Asexual reproduction takes place by fragmentation

39 The euglenoids could be said to bridge the evolutionary gap between plant-like protists and animal-like protists. Choose the option stating the characteristic which supports the above statement.
(a) They have a cell wall but also have flagella
(b) They have true roots, stems and leaves

(c) They have a cell wall but carry on photosynthesis
(d) Many carry on photosynthesis, have flagella and lack a cell wall

40 Which of these groups includes photosynthetic unicellular organisms with flagella and contractile vacuoles?
(a) Diatoms (b) Dinoflagellates
(c) Euglenoids (d) Ciliates

41 Which of the following statements are incorrect?
I. Parapodia are lateral appendages in arthropods, used for swimming.
II. Radula in molluscs are structures involved in excretion.
III. Aschelminthes are dioecious.
IV. Echinoderm adults show radial symmetry.
V. Ctenophores are diploblastic.
(a) I and II (b) I and III
(c) I, IV and V (d) III and V

42 Which organisms are capable of producing a 'red tide'?
(a) Dinoflagellates (b) Chrysophytes (diatoms)
(c) Sporozoans (d) Euglenoids

43 Which characteristic is shared by most diatoms, golden algae and brown algae at least at some stages of their life cycles?
(a) They all have flagella with numerous fine, hair-like projections
(b) All three store food reserves in the form of a glucose polymer called laminarin
(c) All are autotrophs
(d) All of the above

44 A characteristic feature found in *Pheretima* is that,
(a) fertilisation of eggs occurs outside the body
(b) the typhlosole greatly increases the effective absorption area of the digested food in the intestine
(c) the S-shaped setae embedded in the integument are the defensive weapons used against the enemies
(d) it has a long, dorsal tubular heart

45 Which of the following organisms are commercially harvested to extract algin and carrageen in from their cell walls?
(a) Dinoflagellates
(b) Golden algae
(c) Brown and red sea weeds
(d) Marine green algae like *Ulva*

46 Select the correctly matched option with two of its general characteristics.
(a) Echinodermata – Pentamarous, radial symmtry and mostly internal fertilisation
(b) Mollusca – Normally oviparous and development through tornaria larva
(c) Arthropoda – Body divided into head, thorax and abdomen and respiration by tracheae
(d) Chordata – Notochord persists throughout and separate anal and urinary openings to the outside

47 Spirogyral lateral conjugation takes place in
(a) heterosporous species (b) homosporous species
(c) heterothallic species (d) homothallic species

48 In *Fasciola hepatica*, a temporary opening is seen during breeding season, known as
(a) acetabulum (b) Laurer's canal
(c) nematocysts (d) ostia

49 In biology laboratory, a plasmodial slime mould is used as a demonstration organism. One of the student does not understand why this organism is not considered multicellular. How would you explain it to her?
(a) The *Plasmodium* is undivided by membranes and contains many diploid nuclei, therefore, it is not technically multicellular
(b) The distinct cells that make up the *Plasmodium* do not cooperate. So, they do not represent a truly multicellular organism
(c) Plasmodial slime moulds are not able to reproduce sexually, therefore, they are not truly multicellular
(d) Multicellular organisms are seen only in the kindgom–Animalia and Plantae

50 Which of the scientific names of the given organisms is matched incorrectly with their common names?

	Scientific names		Common names
(a)	*Periplanata*	1.	Cockroach
(b)	*Pila globosa*	2.	Apple snail
(c)	*Lepisma*	3.	Cuttle fish
(d)	*Torpedo*	4.	Electric ray

51 Which structures allow plants to readily take up carbon dioxide from the atmosphere?
(a) Stomata (b) Cuticles
(c) Gametangia (d) Mitochondria

52 Flame cells are
(a) copulatory organs in *Pheretima*
(b) locomotory organs in *Nereis*
(c) circulatory organs in *Periplanata*
(d) excretory organs in *Planaria*

53 Ferns and mosses are limited mostly to moist environment because
(a) their pollens are carried by water
(b) they lack cuticles and stomata
(c) they lack vascular tissue
(d) they have swimming sperms

54 Select the correct option in which the organism is correctly matched with its excretory organs.

(a) *Pheretima* — pharyngeal and ventrolateral nephridia
(b) *Ascaris* — renette cells
(c) Cockroach — coxal glands
(d) Human being — kidneys, sebaceous glands and tear glands

55 The dots on the underside of a fern frond are spore cases. Which is true for the plant to which the frond belongs?

(a) It is a spore (b) It is a gamete
(c) It is a sporophyte (d) It is a gametophyte

56 The highest degree of polymorphism is exhibited in

(a) Protozoa (b) Porifera (c) Cnidaria (d) Mollusca

57 Fern gametophytes are

(a) photosynthetic diploid organisms
(b) produced from haploid gametes
(c) part of the asexual life cycle
(d) free-living, multicellular organisms

58 ' Rhagon' is a

(a) type of canal system found in sponges
(b) polymorphic form of *Aurelia*
(c) larva of *Ascaris*
(d) rasping organs in Mollusca

59 Vascular tissues of plants include

(a) xylem for conducting water and minerals and phloem for conducting dissolved organic molecules
(b) xylem for conducting organic molecules and phloem for conducting water and minerals
(c) lignin for conducting organic molecules and phloem for conducting sugars
(d) phloem for conducting water and minerals and lignin for conducting organic molecules

60 'Mushroom glands' are

(a) vascular ridge in earthworm
(b) male reproductive organ in cockroach
(c) source of protective colouration in sepia
(d) respiratiory organs in urochordates

61 Heterosporous plants produce

(a) megaspores that develop into female gametophytes and microspores that develop into male gametophytes
(b) megaspores that develop into male gametophytes and microspores that develop into female gametophytes
(c) megaspores that bear antheridia and microspores that bear archegonia
(d) spores that produce both archegonia and antheridia

62 Which one of the following is true for seed plants, but not true for seedless plants?

(a) The sporophyte is dependent on the gametophyte
(b) The sporophyte is large and the gametophyte is small and independent
(c) The gametophyte is reduced and dependent on the sporophyte
(d) The spore is the main means of dispersing of offspring

63 Match the following columns.

	Column I		Column II
A.	Diploblastic, radial symmetry and tissue level organisation	1.	*Wuchereria*
B.	Triplobtastic, pseudocoelomates and complete digestive system	2.	*Dugesia*
C.	Bilateral symmetry, incomplete digestive system organ and organ system level of organisation	3.	*Cucumaria*
D.	Triploblastic, coelomate and radial symmetry	4.	*Balanoglossus*
		5.	*Hydra*

Codes

	A	B	C	D		A	B	C	D
(a)	3	2	4	5	(b)	3	1	2	5
(c)	5	4	1	3	(d)	5	1	2	3

64 The diploid generation of the plant life cycle always

(a) produces spores
(b) is called the gametophyte
(c) is larger and more conspicuous than the haploid stage
(d) develops from a spore

65 Which of the following statements is true?

(a) Cell aggregate body plan is found in phylum–Platyhelminthes
(b) Radial symmetry is the most common symmetry found in animals
(c) Pseudocoelom is only found is phylum–Aschelminthes
(d) All triploblastic animals have true coelom

66 The closest seedless relatives of seed plants produce one kind of spore that gives rise to a bisexual gametophyte. What does this suggest about the ancestors of seed plants?

(a) They were gymnosperms (b) They were bryophytes
(c) They were heterosporous (d) They were homosporous

67 Which one of the following is a matching set of phylum and its three examples?

(a) Cnidaria–*Bonellia, Physalia* and *Aurelia*
(b) Platyhelminthes–*Planaria, Enterobius* and *Schistosoma*
(c) Mollusca – *Loligo*, *Teredo* and *Octopus*
(d) Porifera – *Spongilla, Euplectella* and *Pennatula*

68 Animals probably evolved from colonial protists. How do animals differ from these protist ancestors?

(a) The protists were prokaryotic
(b) Animals have more specialised cells
(c) The protists were heterotrophic
(d) The protists were autotrophic

69 Where and when does fertilisation occur in the mushroom life cycle?
(a) Underground, as a mycelium begins to spread
(b) On the surface of the ground, when a basidiospore germinates
(c) In a mushroom, when the nuclei of a dikaryotic cell fuse
(d) Underground, when the hyphae of different mating types fuse

70 Lichens are important pioneers in areas that have been burned by fires or destroyed by lava flows because
(a) they are important in the initial stages of soil formation
(b) they release chemicals that maintain the surface of the underlying substratum
(c) they take up excess nitrogen
(d) they thrive on acid rain

71 Which characteristic given below is shared by plants, fungi and animals?
(a) They all have cell walls
(b) All are multicellular eukaryotes
(c) All are held together by structural proteins
(d) All have intracellular junctions known as desmosomes

72 Match the following columns.

Column I	Column II
A. Eucarpic	1. Ascomycetes
B. *Neurospora*	2. Notochord absent
C. Vertebrates	3. *Phytophthora*
D. Invertebrates	4. Phycomycetes
	5. True coelomates

Codes

	A	B	C	D
(a)	1	2	3	4
(b)	3	1	5	2
(c)	4	3	2	1
(d)	5	4	2	1

73 Many members of the red algae are adapted to deeper water due to the observation that
(a) their red pigments readily absorb red light
(b) their cell walls are adapted to withstand bright light
(c) their photosynthetic pigments efficiently absorb blue and green light
(d) they grow long stalks with floats on the ends to hold the blades near the surface

74 The red algae are characterised by
(a) alternation of generations in some species
(b) flagellated gametes that do not require water for fertilisation to occur
(c) population explosions known as 'red tides'
(d) multinucleated portions

75 Symmetry is one of the most basic characteristics of animals. The group that has a different symmetry from the other four groups listed here is the
(a) arthropod (b) chordates (c) molluscs (d) jellies

76 Which of the following is not a difference between algae and plants?
(a) Plant cells have rigid cellulose walls and algal cells do not
(b) plant zygotes develop into embryos, whereas those of algae do not
(c) Algae lack some organs (leaves, stems and roots), characteristic of plants
(d) Plants have xylem and phloem and algae do not

77 Which of the following is associated with bilateral symmetry?
(a) A sessile life style (b) A lack of true tissues
(c) Parazoans (d) Cephalisation

78 Which of the following is not an evidence in favour of the chlorophycean origin of land plants?
(a) Both possess the same type of chlorophylls, *a* and *b*
(b) Carotenoid pigments are similar in the two groups
(c) Starch is the common storage carbohydrate
(d) Cell wall contains similar lignin and algin

79 Alternation of generations
(a) is unique to plants
(b) is distinguished by a unicellular haploid stage and a multicellular diploid generation
(c) consists of a diploid gametophyte stage alternating with a haploid sporophyte stage
(d) is distinguished by haploid and diploid stages that are both multicellular

80 Multiciliate spermatozoids are found in
(a) *Riccia* and *Pteris* (b) *Riccia* and *Funaria*
(c) *Riccia* and *Marchantia* (d) *Pteris* and *Cycas*

81 Unlike other animals, sponges
(a) are unicellular (b) possess cell walls
(c) lack true tissues (d) exhibit bilateral symmetry

82 Gametangia are
(a) single-celled in algae, multicellular in most plants
(b) multicellular in algae, single-celled in most plants
(c) responsible for the plant's ability to retain moisture in arid environment
(d) the site of development of the fertilised egg in algae

83 Which of the following is not a characteristic of cnidarians?
(a) Gastrovascular cavity
(b) Ectoderm
(c) Mesoderm
(d) A lack of true tissues

84 Which is a key difference between alternation of generations in plants and sexual reproduction in non-plant organisms?
(a) In plants, the haploid and diploid stages are both multicellular
(b) In plants, only the haploid stage is multicellular
(c) In plants, the haploid generation is always dependent on the diploid generation
(d) In other sexually reproducing organisms, the haploid and diploid generations are both multicellular

85 The number of germ tissue layers present in animals with bilateral symmetry is
(a) one (b) two (c) three (d) four

86 When you see a green, 'leafy' moss, you are looking at the
(a) spore producing structure
(b) sporophytic generation
(c) gametophytic generation
(d) structure, where meiosis occurs

87 The gametophyte generation of a moss
(a) produces spores
(b) is dependent on the sporophyte
(c) has tracheids but no vessel elements
(d) is haploid

88 How are gametes produced by bryophytes?
(a) By mitosis of gametophyte cells
(b) By meiosis of gametophyte cells
(c) By meiosis of sporophyte
(d) By mitosis of spores

89 During the development of most animals, cleavage leads to
(a) the formation of a zygote
(b) the formation of a blastula
(c) the formation of a gastrula
(d) fertilisation

90 Match the following columns.

	Column I		Column II
A.	Facultative anaerobes	1.	Little leaf disease
B.	*Amoeba*	2.	Non-photosynthetic
C.	Mycoplasma	3.	*Pseudomonas*
D.	Fungi	4.	Diarrhoea

Codes

	A	B	C	D
(a)	1	2	3	4
(b)	4	2	1	3
(c)	2	3	1	4
(d)	3	4	1	2

ANSWERS

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