A A

Hall Ticket Number

Q. B. No. 1 7 4 3 2 1

Marks : 100

Time : 120 Minutes

3TB2S

Booklet Code : **A**

Signature of the Candidate

Signature of the Invigilator

INSTRUCTIONS TO THE CANDIDATE

(Read the Instructions carefully before Answering)

1. Separate Optical Mark Reader (OMR) Answer Sheet is supplied to you along with Question Paper Booklet. Please read and follow the instructions on the OMR Answer Sheet for marking the responses and the required data.
2. The candidate should ensure that the Booklet Code printed on OMR Answer Sheet and Booklet Code supplied are same.
3. **Immediately on opening the Question Paper Booklet by tearing off the paper seal, please check for (i) The same booklet code (A/B/C/D) on each page, (ii) Serial Number of the questions (1-100), (iii) The number of pages and (iv) Correct Printing.** In case of any defect, please report to the invigilator and ask for replacement of booklet with same code within five minutes from the commencement of the test.
4. Electronic gadgets like Cell Phone, Calculator, Watches and Mathematical/Log Tables are not permitted into the examination hall.
5. **There will be ¼ negative mark for every wrong answer.** If the response to the question is left blank without answering, there will be no penalty of negative mark for that question.
6. Using Blue/Black ball point pen to darken the appropriate circles of (1), (2), (3) or (4) in the OMR Sheet corresponding to correct or the most appropriate answer to the concerned question number in the sheet. Darkening of more than one circle against any question automatically gets invalidated and will be treated as wrong answer.
7. Change of an answer is NOT allowed.
8. Rough work should be done only in the space provided in the Question Paper Booklet.
9. Return the OMR Answer Sheet and Question Paper Booklet to the invigilator before leaving the examination hall. Failure to return the OMR sheet and Question Paper Booklet is liable for criminal action.

This Booklet consists of 20 Pages for 100 Questions + 3 Pages of Rough Work + 1 Title Page i.e., Total 24 Pages.

SPACE FOR ROUGH WORK

Time : 2 Hours Marks : 100

Instructions :

(i) Each question carries **one** mark and ¼ negative mark for every wrong answer.

(ii) Choose the correct or most appropriate answer from the given options to the following questions and darken, with Blue/Black Ball Point Pen, the corresponding digit **(1)**, **(2)**, **(3)** or **(4)** in the circle pertaining to the question number concerned in the OMR Answer Sheet, separately supplied to you.

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1. Match the following :

	Institute		**Location**
(a)	Central Drug Research Institute	(i)	Dehradun
(b)	Institute of Himalayan Bioresource Technology	(ii)	Palampur
(c)	Centre for Cellular and Molecular Biology	(iii)	Hyderabad
(d)	Forest Research Institute	(iv)	Lucknow

Choose the **correct** answer :

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

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2. Study of fishes is called :

(1) Ornithology (2) Herpetology

(3) Anthropology (4) Ichthyology

---

3. The theory of Biogenesis was experimentally proved by :

(1) S.A. Waksman (2) Alexander Fleming

(3) Edward Jenner (4) Louis Pasteur

---

4. Match the following lists :

	List - I		**List - II**
(a)	Lycopersicon	(i)	Family
(b)	Polemoniales	(ii)	Species
(c)	Moraceae	(iii)	Genus
(d)	Lablab	(iv)	Division
		(v)	Order

Choose the **correct** answer :

	(a)	**(b)**	**(c)**	**(d)**
(1)	(iii)	(iv)	(i)	(v)
(2)	(v)	(ii)	(iii)	(iv)
(3)	(iii)	(v)	(i)	(ii)
(4)	(iv)	(i)	(ii)	(iii)

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5. Five kingdom classification was given by :

(1) R.H. Whittaker (2) Carl linnaeus (3) Carl Woese (4) Lynn Margulis

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6. **Assertion (A) :** Dung of cattle is used for biogas production.

Reason (R) : Some Archaebacterial species which are present in the gut of such animals produce CH_4.

Choose the **correct** answer :

(1) Both **(A)** and **(R)** are true and **(R)** is the correct explanation of **(A)**.

(2) Both **(A)** and **(R)** are true, but **(R)** is not the correct explanation of **(A)**.

(3) **(A)** is true, but **(R)** is false.

(4) **(A)** is false, but **(R)** is true.

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7. Match the following :

	List - I		**List - II**
(a)	Mycoplasmas	(i)	mycolic acid
(b)	Actinomycetes	(ii)	diatoms
(c)	Kieselguhr	(iii)	lack cell wall
(d)	Noctiluca	(iv)	cytopharynx
		(v)	bioluminescence

Choose the **correct** answer :

	(a)	**(b)**	**(c)**	**(d)**
(1)	(iii)	(i)	(ii)	(v)
(2)	(iii)	(ii)	(i)	(iv)
(3)	(i)	(iii)	(iv)	(v)
(4)	(v)	(iv)	(ii)	(iii)

---

8. Match the following :

	List - I		List - II
(a)	*Clostridium*	(i)	Toxic protein
(b)	*Aspergillus*	(ii)	Butyric acid
(c)	*Monascus purpurens*	(iii)	Citric acid
(d)	*Bacillus thuringiensis*	(iv)	Statins
		(v)	Cyclosporin - A

Choose the **correct** answer :

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

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9. **Assertion (A) :** Some Photosynthetic algae can form symbiotic associations with fungi.

Reason (R) : Fungal associations with algae involve absorption of nutrients by plants.

Choose the **correct** answer :

(1) Both **(A)** and **(R)** are true and **(R)** is the correct explanation of **(A)**.

(2) Both **(A)** and **(R)** are true, but **(R)** is not the correct explanation of **(A)**.

(3) **(A)** is true, but **(R)** is false.

(4) **(A)** is false, but **(R)** is true.

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10. The process of transfer of DNA from one bacterial cell to another bacterial cell was first observed by :

(1) Frederick Griffith in Streptococcus Pneumoniae

(2) Lederberg and Tatum in E. Coli

(3) Lederberg and Zinder in Salmonella Typhimurium

(4) Jacob and Monod in E. Coli

---

11. Suberin occurs in association with :

(1) cellulose in cork cells of endoderm (2) hemicellulose in cork cells of protoderm

(3) cellulose in cork cells of the periderm (4) pectin in cork cells of the endoderm

---

12. Function of the nucleolus is :

(1) DNA synthesis (2) ATP synthesis

(3) t-RNA synthesis (4) Assembly of ribosomes

---

13. Which of the following cell organelles contain deoxy-nucleic acid :

(1) Chloroplast and Mitochondria

(2) Golgi bodies and Endoplasmic reticulum

(3) Mitochondria and Lysosome

(4) Nucleus and Lysosome

---

14. The **correct** order of sub stages of Prophase - I of meiosis are :

(1) Leptotene, Zygotene, Diakinesis, Diplotene, Pachytene

(2) Leptotene, Diplotene, Zygotene, Pachytene, Diakinesis

(3) Leptotene, Zygotene, Pachytene, Diplotene, Diakinesis

(4) Leptotene, Zygotene, Pachytene, Diakinesis, Diplotene

---

15. **Assertion (A) :** Cell cycle in eukaryotes is divided into four overlapping phases or stages; G_1, S, G_2 and M phases.

Reason (R) : The function of cell cycle is to duplicate the genome and divide it equally between two daughter cells. For this reason, it is important that the events of the cell cycle proceed in correct order, and each stage of the cell cycle is completed before the next stage commences.

Choose the **correct** answer :

(1) Both **(A)** and **(R)** are true and **(R)** is the correct explanation of **(A)**.

(2) Both **(A)** and **(R)** are true, but **(R)** is not the correct explanation of **(A)**.

(3) **(A)** is true, but **(R)** is false.

(4) **(A)** is false, but **(R)** is true.

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16. DNA replication takes place in which stage of cell cycle ?

(1) G_2 Phase (2) S Phase (3) G_1 Phase (4) M Phase

---

17. Which of the following is the **correct** statement regarding the enzyme activity ?

(1) Enzymes lowers the activation energy

(2) Enzymes increases the activation energy

(3) Enzymes do not change the activation energy

(4) Increase free energy

---

18. Read the following statements.

(a) Plants cannot synthesize ten essential amino acids.

(b) Stem cells alone are capable of converting to other cell types in animal cells.

(c) During cytokinesis in plants, a cell plate is constructed.

(d) Plasmodesmata mediate movement of molecules and communication signals between individual animal cells.

Choose the **correct** statements.

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

---

19. Which of the following statement is **false** regarding proteins and their function ?

(1) GLUT - 4 enables glucose transport into cells

(2) Collagen forms intercellular ground substance

(3) Trypsin is an enzyme

(4) All proteins are enzymes

---

20. **Correct** order of layers (from outer to inner) present in transverse section of gut is :

(1) Muscularis, Serosa, Sub-mucosa, Mucosa

(2) Serosa, Muscularis, Mucosa, Sub-mucosa

(3) Serosa, Muscularis, Sub-mucosa, Mucosa

(4) Mucosa, Sub-mucosa, Muscularis, Serosa

---

21. Ciliated epithelium is found in :

(1) Bronchioles (2) Oesophagus (3) Skin (4) Urinary bladder

---

22. Fleshy flattened and fleshy cylindrical stem modifications are seen respectively in :

(1) Opuntia and Asparagus (2) Asparagus and Euphorbia

(3) Opuntia and Euphorbia (4) Euphorbia and Asparagus

---

23. Match the following lists :

	List - I		**List - II**
(a)	Mangifera	(i)	Spadix
(b)	Jasmine	(ii)	Hypanthodium
(c)	Colocasia	(iii)	Cyathium
(d)	Ficus	(iv)	Receme
		(v)	Cymule

Choose the **correct** answer :

	(a)	**(b)**	**(c)**	**(d)**
(1)	(iii)	(v)	(i)	(iv)
(2)	(ii)	(iii)	(iv)	(i)
(3)	(i)	(ii)	(v)	(iii)
(4)	(iv)	(v)	(i)	(ii)

---

24. **Assertion (A) :** Photophosphorylation is the synthesis of ATP from ADP and inorganic phosphate due to a light driven electron transport.

Reason (R) : The terminal electron accepter in respiratory electron transport is oxygen.

Choose the **correct** answer :

(1) Both **(A)** and **(R)** are true and **(R)** is the correct explanation of **(A)**.

(2) Both **(A)** and **(R)** are true, but **(R)** is not the correct explanation of **(A)**.

(3) **(A)** is true, but **(R)** is false.

(4) **(A)** is false but **(R)** is true

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25. Which one is total root parasite ?

(1) *Loranthus* (2) *Santalum* (3) *Orobanche* (4) *Viscum album*

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26. Glycolytic reaction catalyzed by which of the following enzyme results in the formation of ATP ?

(1) Hexokinase (2) G-3-P dehydrogenase

(3) Phosphoglycerokinase (4) Enolase

---

27. Match the following :

	List - I (Crop variety)		**List - II (Resistance to disease)**
(a)	Wheat (Himagiri)	(i)	Bacterial blight
(b)	Brassica (Pusa swarnim)	(ii)	Leaf and stripe rust
(c)	Cowpea (Pusa komal)	(iii)	Tobacco mosaic virus and leaf curl
(d)	Chilli (Pusa sadabahar)	(iv)	White rust
		(v)	Black rot

Choose the **correct** answer :

	(a)	**(b)**	**(c)**	**(d)**
(1)	(ii)	(i)	(iv)	(v)
(2)	(ii)	(iv)	(i)	(iii)
(3)	(iii)	(ii)	(v)	(i)
(4)	(i)	(iii)	(ii)	(iv)

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28. **Assertion (A) :** Inactive Bt Prototoxin becomes active form of toxin in the insect gut.

Reason (R) : Acidic pH of the Insect-gut solubilises and thus activates Bt toxin.

Choose the **correct** answer :

(1) Both **(A)** and **(R)** are true and **(R)** is the correct explanation of **(A)**.

(2) Both **(A)** and **(R)** are true, but **(R)** is not the correct explanation of **(A)**.

(3) **(A)** is true, but **(R)** is false.

(4) **(A)** is false, but **(R)** is true.

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29. Which of the following plant hormone kills dicotyledonous weeds, but does not affect mature monocotyledonous plants ?

(1) Gibberellic acid (GA_3)

(2) 2, 4 - dichlorophenoxy acetic acid

(3) Ethephon

(4) Cytokinin

---

30. Which one of the following photosynthetic pigments is **not** an accessory pigment ?

(1) Chlorophyll b

(2) Xanthophylls

(3) Carotenoids

(4) Chlorophyll a

---

31. **Assertion (A) :** The immediate cause of opening or closing of the stomata is a change in the turgidity of the guard cells.

Reason (R) : Thin and elastic inner wall of guard cells and longitudinal orientation of cellulose microfibrils in the cell wall of the guard cells aid in stomatal opening and closing.

Choose the **correct** answer :

(1) Both **(A)** and **(R)** are true and **(R)** is the correct explanation of **(A)**.

(2) Both **(A)** and **(R)** are true, but **(R)** is not the correct explanation of **(A)**.

(3) **(A)** is true, but **(R)** is false.

(4) **(A)** is false, but **(R)** is true.

---

32. Match the following :

	List - I		**List - II**
(a)	epipetalous	(i)	citrus
(b)	polyadelphous	(ii)	brinjal
(c)	epiphyllous	(iii)	china rose
(d)	monoadelphous	(iv)	lily
		(v)	pea

Choose the **correct** answer :

	(a)	**(b)**	**(c)**	**(d)**
(1)	(ii)	(iv)	(i)	(iii)
(2)	(v)	(ii)	(iii)	(iv)
(3)	(iv)	(iii)	(v)	(i)
(4)	(ii)	(i)	(iv)	(iii)

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33. Which one of the following insectivorous plant use its modified leaves to trap insects for their nitrogen requirement ?

(1) Cacti (2) Acacia (3) Nerium (4) Dionea

---

34. Match the following :

	List - I		**List - II**
(a)	Holozoic	(i)	*Trypanasoma*
(b)	Parasitic	(ii)	*Rhincomonas*
(c)	Coprozoic	(iii)	*Amoeba*
(d)	Holophytic	(iv)	*Euglena*

Choose the **correct** answer :

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

---

35. The events during erythrocytic cycle of plasmodium are given below :

(a) gametocyte formation (b) ameboid stage (c) trophozoite

(d) signet ring stage (e) shizont stage

The **correct** order of sequence is :

(1) (c) - (d) - (e) - (b) - (a) (2) (d) - (c) - (e) - (a) - (b)

(3) (c) - (d) - (b) - (e) - (a) (4) (a) - (b) - (c) - (e) - (d)

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36. Match the following :

	List - I		**List - II**
(a)	Rhizopodium	(i)	Difflugia
(b)	Filopodium	(ii)	Gromia
(c)	Axopodium	(iii)	Elphidium
(d)	Lobopodium	(iv)	Actinophrys

Choose the **correct** answer :

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

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37. How many floating ribs are found in human ?

(1) Three pairs (2) Two pairs (3) One pair (4) Four pairs

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38. Study the following characteristic features.

(a) Diploblastic body wall (b) Radial symmetry

(c) Coelenteron body cavity (d) Extra and intra cellular digestion

(e) Asexual mode of reproduction (f) Holoblastic cleavage

The above features are present in the phylum :

(1) Platihelminthes (2) Cnidaria (3) Polifera (4) Annelida

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39. Hirudinaria (Leech) contains x pairs of testes and y pairs of nephridia.

(1) x - 14; y - 19 (2) x - 5; y - 2 (3) x - 11; y - 17 (4) x - 10; y - 13

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40. CO_2 transported in blood mainly in the form of :

(1) Dissolved in plasma (2) Bicarbonate

(3) Carbonates (4) Carbamino Compounds

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41. In amniocentesis amniotic fluid is collected for the diagnosis of :

(1) Viral infection (2) Bacterial infection

(3) Physiological abnormalities (4) Chromosomal abnormalities

---

42. Match the following :

	List - I		**List - II**
(a)	Myopia	(i)	loss of power of accommodation of lens
(b)	Presbyopia	(ii)	near-sightedness
(c)	Hypermetropia	(iii)	non- uniform curvature of cornea
(d)	Astigmatism	(iv)	far-sightedness

Choose the **correct** answer :

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

---

43. Podocytes are found in :

(1) Proximal convoluted duct (2) Bowman's Capsule

(3) Ascending loop of Henley (4) Descending loop of Henley

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44. Match the following cell types with their corresponding secretions :

	Cell type		**Secretions**
(a)	Goblet cells	(i)	Pepsinogen
(b)	Chief cells	(ii)	HCl
(c)	Oxyntic cells	(iii)	Mucus
(d)	Beta cells	(iv)	Insulin

Choose the **correct** answer :

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

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45. The following national act provided legal framework on 'Induced abortion' :

(1) Medical Termination of Foetus Act (MTFA), 1990.

(2) Medical Termination of Pregnancy Act, 1964.

(3) Medical Termination of Pregnancy Act, 1971.

(4) Medical Pregnancy Act, 1974.

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46. Maximum absorption of the end products of digestion occurs in :

(1) Duodenum (2) Stomach (3) Small Intestine (4) Large Intestine

---

47. Each haemoglobin molecule can carry a maximum of how many molecules of oxygen ?

(1) 2 (2) 3 (3) 4 (4) 1

---

48. The structure of the sporozoite of *plasmodium vivax* was studied by :

(1) Ernst Haeckel (2) Garnham

(3) Sir Ronald Ross (4) Camillo Golgi

---

49. Match the following :

	List - I **(Species)**		**List - II** **(Type of malaria)**
(a)	*Plasmodium vivax*	(i)	mild tertian malaria
(b)	*Plasmodium falciparum*	(ii)	benign tertian malaria
(c)	*Plasmodium ovale*	(iii)	quartan malaria
(d)	*Plasmodium malariae*	(iv)	malignant tertian malaria

Choose the **correct** answer :

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

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50. The middle ear of a human contains three ossicles called :

(1) External auditory meatus, tymparum, cochlea

(2) Scala vestibuli, scala media, scala tympani

(3) Malleus, incus, stapes

(4) Ampulla, saccule, utricle

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51. The lens of the eye held in position by :

(1) Inferior oblique muscles (2) Superior oblique muscles

(3) Suspensory ligaments (4) Medial rectus muscles

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52. The following pump plays an important role in the opening and closing of stomata :

(1) Sodium pump (2) Potassium pump

(3) Na^+/k^+ pump (4) Proton pump

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53. Organs of Corti is situated in :

(1) Reissner's membrane (2) Scala tympani

(3) Basilar membrane (4) Tectorial membrane

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54. Snake venom contains all the following except :

(1) Disintegrins (2) Toxic proteins

(3) Toxic carbohydrates (4) Sarafotoxins

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55. A diet high in saturated fats can be linked to which of the following ?

(1) Muscular dystrophy (2) Bulimia

(3) Anorexia (4) Cardiovascular disease

---

56. World Health Organization is located in :

(1) New Delhi (2) Geneva (3) New York (4) London

---

57. "While the general type of vegetation is not related to temperature, the type of flora of a particular region is determined by it."

This law is called as :

(1) Liebig's law (2) Schimper's first law

(3) Law of thermal energy (4) Law of sciophytes

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58. Aquatic ecosystems are divided as fresh water and marine ecosystems. The lentic ecosystem represents the following :

(1) Ocean (2) Spring (3) Lake (4) Estuary

---

59. Whenever energy is transferred from one form to other form, the amount of useful energy decreases because of the loss in the form of heat. This is known as :

(1) Single - channel energy model (2) Free-energy

(3) Enthalpy (4) Entropy

---

60. Match the following national parks with their corresponding protected species :

	List - I		**List - II**
	National Parks		**Protected Animals**
(a)	Dachigam National Park	(i)	Birds
(b)	Keoladeo National Park	(ii)	Kashmir Stag
(c)	Rajaji National Park	(iii)	Asiatic Lion
(d)	Gir Forest National Park	(iv)	Asian Elephant

Choose the **correct** answer :

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

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61. A zone of junction or a transition area between two diverse communities where these communities integrate is known as :

(1) Community Dynamics (2) Ecotone

(3) Ecological Niche (4) Ecological Succession

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62. The sequence of general process of ecological succession involves the following steps. Choose the **correct** answer :

(1) Nudation → Aggregation → Invasion → Ecesis → Reaction → Competition → Stabilization

(2) Nudation → Invasion → Ecesis → Aggregation → Competition → Reaction → Stabilization

(3) Nudation → Ecesis → Reaction → Aggregation → Competition → Invasion → Stabilization

(4) Nudation → Aggregation → Competition → Invasion → Ecesis → Reaction → Stabilization

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63. Bhopal gas tragedy occurred due to the release of a gas from Union Carbide industry which took many lives. The gas released from the industry is :

(1) Methyl isocyanate (2) Sulphur dioxide

(3) Carbon monoxide (4) Methane

---

64. The presence of excess nutrients in ponds and lakes create a situation of excess growth of algae causing algal blooms on the surface of the water. This situation is known as :

(1) Ecological Niche (2) Edge effect

(3) Eutrophication (4) Ecological Succession

---

65. In the process of destruction of ozone, the following atom functions as a catalyst :

(1) Oxygen atom (2) Chlorine atom (3) Carbon atom (4) Hydrogen atom

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66. Minamata disease occurred at Minamata Bay on the coast of Kyushu, an island of Japan. This disease is caused due to :

(1) Cadmium (2) Copper (3) Mercury (4) Lead

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67. The National Forest Policy (1988) of India has recommended the following forest cover for the plains and for the hills respectively :

(1) 50 and 50 percent (2) 33 and 67 percent

(3) 30 and 70 percent (4) 40 and 60 percent

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68. Greenhouse effect is responsible for heating the earth's surface and atmosphere. The greenhouse effect is due to the following gases :

(1) Carbon oxides, Sulphur oxides, Nitrous oxides

(2) Carbon dioxide, Methane, CFCs

(3) Sulphur dioxide, Carbon dioxide, Nitrous oxides

(4) Nitrous oxide, Methane, Sulphur oxides

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69. The phenomenon of multiple expression of a single gene is called :

(1) Sex index (2) Polymorphism (3) Pleiotropy (4) Sex linked gene

---

70. The blood types are inherited by the interaction of three autosomal alleles of the gene located on :

(1) Chromosome 18 (2) Chromosome 9

(3) Chromosome 7 (4) Chromosome 12

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71. When a women with normal vision (homozygous) marries a colour-blind man. The sons and daughters are normal but daughters are carriers (heterozygous).

If a carrier women for colour blindness marries a man with normal vision, their offsprings will be :

(1) All the sons and daughters are colour blind.

(2) All the daughters and half of the sons have normal vision and the other half of the sons are colour blind.

(3) All the sons and half the daughters have normal vision and the other half of the daughters are colour blind.

(4) All the daughters are colour blind and all sons have normal vision.

---

72. A recessive X - Linked genetic disorder involving lack of a functional Factor VIII and accounts for :

(1) Colour blindness (2) Duchenne muscular dystrophy

(3) Baldness (4) Haemophilia

---

73. The presence of immunogenic D antigen indicates the following condition :

(1) 'A' blood group (2) 'B' blood group (3) 'Rh' positive (4) 'ABO' blood group

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74. The sickle - cell anaemia, an autosomal recessive genetic blood disorder, is controlled by a single pair of alleles, Hb^A and Hb^s found on :

(1) Chromosome 12 (2) Chromosome 7

(3) Chromosome 11 (4) Chromosome 16

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75. Identify the **correct** sequence of DNA fingerprinting :

(a) Obtaining and fragmenting DNA

(b) Using probes to identify specific DNA

(c) Separation of DNA fragments by electrophoresis

(d) Hybridization with probes

(e) Denaturing DNA and blotting

(f) Exposure on film to make a DNA fingerprint

(1) (b) → (a) → (c) → (d) → (e) → (f) (2) (a) → (c) → (e) → (b) → (d) → (f)

(3) (e) → (a) → (b) → (c) → (d) → (f) (4) (a) → (b) → (c) → (e) → (d) → (f)

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76. A base is changed by the repositioning of a hydrogen atom altering the hydrogen bonding pattern of that base, resulting in incorrect base pairing during replication is :

(1) Tautomerism (2) Deamination

(3) Spontaneous mutation (4) Induced mutation

---

77. Because of deficiency in Homogentisate 1, 2 - deoxygenase, blocking Tyrosine degradation occurs and this results in :

(1) Albinism (2) Phenyl Ketonuria

(3) Alkaptonuria (4) Hyperphenyl alaninaemia

---

78. The following is an autosomal recessive genetic disorder results due to mutation affecting a gene in the long arm of chromosome 7 :

(1) Sickle-cell-anaemia (2) Haemophilia

(3) Cystic fibrosis (4) Leukemia

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79. Excessive degradation of red blood cells due to formation of abnormal haemoglobin molecules, because of the defects caused by genetic mutations, will result in :

(1) Edwards syndrome (2) Klinefelter's syndrome

(3) Colour blindness (4) Thalassemia

---

80. The change in the frequency of gene that occurs merely by chance and not by selection in small population is called :

(1) Speciation (2) Genetic drift (3) Genetic load (4) Gene flow

---

81. Different structures evolving for the same function and hence having similarity is known as :

(1) Biological Evolution (2) Convergent Evolution

(3) Divergent Evolution (4) Adaptive Radiation

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82. Living organisms evolved gradually through evolution involving two mechanisms i.e. Principle of use and disuse and Inheritance of acquired characters. This theory is known as :

(1) Biogenesis (2) Neo Darwinism (3) Darwinism (4) Lamarckism

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83. The golden age of reptiles in the geological time scale is :

(1) Coenozoic era (2) Palaeozoic era (3) Mesozoic era (4) Precambrian era

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84. Sudden appearance of some vestigial organs in a better developed condition is called :

(1) Analogous organs (2) Connecting link

(3) Atavism (4) Homologous organs

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85. In the Natural selection, survival of the fittest phenomenon is coined by the following scientist :

(1) Herbert Spencer (2) Alfred Russel Wallace

(3) Darwin (4) Lamarck

---

86. Read the following statements :

(a) They occur from time to time in naturally breeding populations

(b) They are discontinuous and are not accumulated over generations

(c) They are full fledged and so there are no intermediate forms

(d) They are subjected to natural selection

Which one of the following theories is better explained by the salient features given above ?

(1) Theory of Heridily (2) Mutation Theory

(3) Darwin's Theory (4) Lamarck's Theory

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87. A principle stating that the allelic frequencies in a population will remain constant from generation to generation under certain set conditions, is called :

(1) Natural selection (2) Gene flow

(3) Hardy - Weinberg equilibrium (4) Genetic load

---

88. The existence of deleterious genes within the population is called :

(1) Gene mutation (2) Genetic Drift (3) Genetic Load (4) Gene Flow

---

89. Match the following :

	List - I		**List - II**
(a)	anagenesis	(i)	If speciation takes place in the organisms which live in the same habitat, capable of interbreeding, but do not interbreed due to some isolation mechanism
(b)	cladogenesis	(ii)	If speciation takes place due to geographical isolation
(c)	allopatric speciation	(iii)	Evolution of a new species in a single lineage
(d)	sympatric speciation	(iv)	If one species diverges to become two or more species

Choose the **correct** answer :

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

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90. Identify the **correct** sequence of the stages of human evolution **:**

(1) Dryopithecus → Australopithecus → Homohabilis → Homoerectus → Homoneanderthalensis → Homosapiens

(2) Homohabilis → Dryopithicus → Homoneanderthalensis → Australopithecus → Homohabilis → Homosapiens

(3) Homoneanderathalensis → Dryopithecus → Australopithecus → Homoerectus → Homohabilis → Homosapiens

(4) Australopithecus → Dryopithicus → Homoerectus → Homohabilis → Homoneanderthalensis → Homosapiens

---

91. The aim of breeding animals is for the following desirable qualities

(a) Increase in the quality and quantity of milk, meat , wool etc

(b) To have new technologies

(c) Enhanced productive life by improving the genetic merit of livestock

(d) For good management of livestock

The **correct** answer is :

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

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92. Bird flu disease is caused by :

(1) H_5N_1 (2) H_2N_1 (3) N_1H_3 (4) N_1H_4

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93. The vaccines against Diphtheria and tetanus are :

(1) Attenuated whole agent vaccines (2) Serum vaccines

(3) Inactivated whole agent vaccines (4) Toxoids

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94. The first clinical gene therapy was given in 1990 to a four year girl with the following deficiency :

(1) Phenylalanine hydroxylase (2) Adenosine deaminase

(3) Homogentisate - 1, 2 - dioxygenase (4) Tyrosine - 3 - mono oxygenase

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95. Pap Smear test is done to detect the following cancer :

(1) Prostate cancer (2) Blood cancer

(3) Cervical cancer (4) Breast cancer

---

96. Match the following :

	List - I		**List - II**
(a)	Totipotent	(i)	differentiate into nearly all types of cells
(b)	Pluripotent	(ii)	can produce only one cell type, their own
(c)	Multipotent	(iii)	construct a complete viable organism
(d)	Unipotent	(iv)	can differentiate into a number of types of cells of closely related family of cells

Choose the **correct** answer :

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

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97. The first transgenic Cow, Rosie produced the following :

(1) Human alpha - lactalbumin (2) Insulin - like growth factor

(3) α - 1 - antitrypsin (4) Insulin

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98. Enzyme - Linked Immunosorbent Assay (ELISA) is a biochemical procedure to detect :

(1) Cancer (2) Genes

(3) Antibodies (4) Blood groups

---

99. Match the following :

	List - I		**List - II**
(a)	MRI	(i)	Is a non invasive procedure for recording electrical changes in the heart.
(b)	ECG	(ii)	A process of producing a two dimensional slice through a 3 - dimension object.
(c)	EEG	(iii)	Uses Magnetism, Radio waves and a Computer to produce images of body components.
(d)	CT Scan	(iv)	A process of recording the electrical activity of the brain.

Choose the correct answer :

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

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100. The following Honey bees are widely used in bee keeping in India :

(1) *Musca domestica* (2) *Blatta orientalis*

(3) *Apis cerana indica* (4) *Prolixus Rhodnius*

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