[ENGLISH VERSION]

(Special Instruction for Visually Challenged Candidates)

*Answer Question No. **4.1(A)** instead of Question No. **4.1** in Group D.*

Instruction on the number of questions to be attempted from each group is provided in the beginning of each group.

Group 'A'

(All questions are compulsory)

1. **Write the correct alternative answer for each question in the answer script along with its serial no.** **1×15=15**

1.1 Which of the following pairs is incorrect ?

(a) Cerebrum – memory
(b) Hypothalamus – control of body temperature
(c) Medulla oblongata – control of balance
(d) Pons – control of micturition

1.2 The optic, vagus and trochlear nerves, by nature of their function are, respectively

(a) mixed, motor, sensory
(b) sensory, mixed, motor
(c) motor, sensory, mixed
(d) mixed, sensory, mixed

1.3 Match the words in Column A with the phrases in Column B. An extra phrase has been provided in Column B.

Column A	Column B
i. Photonastic movement	a. The leaves of touch me not plant *(Mimosa pudica)* droop when touched
ii. Thermonastic movement	b. Sunflowers bloom in bright light
iii. Seismonastic movement	c. The hairs of the sundew leaves bend and capture insects under the influence of chemicals from the insects
iv. Chemonastic movement	d. Tulips bloom in warmer temperature
	e. The roots of a plant move towards water

(a) i – d, ii – a, iii – c, iv – b
(b) i – c, ii – b, iii – a, iv – e
(c) i – b, ii – d, iii – a, iv – c
(d) i – e, ii – c, iii – d, iv – b

(Contd.)

1.4 Which of the following events is observed in the telophase of mitosis in an animal cell ?

(a) The nuclear membrane and the nucleolus disappear
(b) The daughter chromosomes move towards the poles
(c) The nuclear membrane and the nucleolus reappear
(d) The chromosomes are arranged on the equatorial plane of the cell

1.5 Which of the following statements is correct regarding self pollination ?

(a) No agent is needed
(b) Pollens are wasted in a large number
(c) New characters appear in the offsprings
(d) Seeds germinate in a large proportion

1.6 How many of the following statements regarding the telomere is/are correct ?

- The terminal part of each arm of a chromosome is called a telomere.
- No other chromosome can attach to this part.
- The spindle fibres attach to this part.
- This part participates in the formation of the nucleolus.

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

1.7 Which one is a dominant trait in case of the pea plant ?

(a) Height of the stem – dwarf
(b) Position of the flower – terminal
(c) Shape of the mature seed – round
(d) Colour of the mature cotyledon – green

1.8 One possible genotype for a Guinea Pig with a phenotype of white and rough hair is bbRr. What is its other possible genotype ?

(a) BbRr
(b) Bbrr
(c) bbrr
(d) bbRR

1.9 Which of the following statements is correct ?

(a) Colour blindness is an X-linked dominant genetic disease
(b) Thalassemia is an X-linked recessive genetic disease
(c) Haemophilia is an X-linked recessive genetic disease
(d) Thalassemia is an autosomal dominant genetic disease

(Contd.)

1.10 A few postulates regarding evolution are mentioned below :

- Law of use and disuse
- Survival of the fittest
- Inheritance of acquired characters
- Natural selection
- Struggle for existence
- Prodigality of reproduction (or production).

How many of these are tenets of Darwin's Theory ?

(a) 4 (b) 2
(c) 6 (d) 3

1.11 Which basic component of the living body was produced in the experiment of Miller and Urey ?

(a) Formaldehyde (b) Hydrogen Cyanide
(c) Ribose sugar (d) Amino acid

1.12 Which changes are observed in the front and hind legs of the modern horse in its evolutionary course ?

(a) Hoof absent, two toes in each leg (b) Hoof absent, three toes in each leg
(c) Hoof present, three toes in each leg (d) Hoof present, one toe in each leg

1.13 The natures of the reserved forests of West Bengal – Jaldapara, Bethuadahari and the Sunderbans are, respectively

(a) Sanctuary, Biosphere reserve, Sanctuary
(b) Biosphere reserve, National park, Sanctuary
(c) National park, Sanctuary, Biosphere reserve
(d) Sanctuary, National park, Sanctuary

1.14 The causes of the Himalayan Musk deer and Sarpagandha (Indian Snake root) being endangered are, respectively

(a) Climatic changes due to global warming, Pollution
(b) Poaching, overexploitation
(c) Invasion of exotic species, Habitat destruction
(d) Habitat destruction, Poaching

1.15 An effect of soil pollution is

(a) Deafness (b) Global warming
(c) Bronchitis (d) Biomagnification

(Contd.)

Group 'B'

2. **Answer 21 questions out of the 26 questions given below as instructed.** **1×21=21**

Fill in the blanks with proper words in the following sentences (any five) : **1×5=5**

2.1 The _____ is the effector organ in the reflex arc.

2.2 Chromatin reticulum and chromosomes are different states of spiralisation of _____ molecule.

2.3 Of the two types of earlobe – free and attached, the _____ earlobe is the dominant trait.

2.4 According to Scientist Oparin, Earth's atmosphere before the origin of life was of _____ nature in respect of its oxidative or reductive power.

2.5 An avian species of the southern polar region, endangered due to global warming and climatic changes is _____.

2.6 *Nitrosomonas* and *Nitrobacter* participate in the _____ step of the Nitrogen cycle.

Write whether the following sentences are true or false (any five) : **1×5=5**

2.7 Choroid minimises reflection of light, and thus helps in the formation of a sharp image on the retina.

2.8 In asexual reproduction offsprings can be produced from a single parental organism.

2.9 The percentage of dwarf pea plants among the offsprings born of hybridisation between a hybrid tall pea plant and a dwarf pea plant is 100.

2.10 Homologous organs indicate convergent evolution.

2.11 The snow leopard is an endangered animal of the Sundaland Hotspot.

2.12 Gibberellins break the dormancy of buds and seeds.

Match the words in the Column A with the most appropriate respective words in the Column B, and write the correct pair along with their respective serial numbers (any five). **1×5=5**

Column A	Column B
2.13 Adductor muscle	a. Prevention of hereditary diseases
2.14 Meiosis	b. Greenhouse gas
2.15 Genetic counselling	c. Keeping chromosome number constant
2.16 Red gland	d. Releasing gas in fish's swim bladder
2.17 Nitrous oxide	e. Latissimus dorsi
2.18 Cell differentiation phase of growth	f. Formation of tissues and organs
	g. Piriformis

(Contd.)

Answer in a single word or in a complete sentence (any six) : **1×6=6**

2.19 Find and write the odd word –

Prolactin, Vasopressin, Acetylcholine, Insulin.

2.20 Write a function of the neuroglia cell.

2.21 Find the relationship of the first pair of words, and write an appropriate word in the gap of the second pair :

Purine : Adenine : : Pyrimidine : _____.

2.22 In case of a cross between two organisms bearing the genotypes BBRR and bbrr respectively, the genotypes BBRR and BbRr appear in the ratio of 1 : 4 among the F_2 generation offsprings. What would be the ratio of the genotypes BBRr and BbRR in that generation ?

2.23 Which feature of the pea flower allows self pollination and if needed, cross pollination ?

2.24 Give an example of struggle for existence between two different species of birds for the same food.

2.25 One of the following four terms includes the other three. Find and write it.

Agricultural waste, microbes, water pollution, eutrophication.

2.26 Name one such substance other than insecticides and weedicides present in the environment which can cause cancer.

Group 'C'

3. **Answer any 12 questions each in 2-3 sentences out of the 17 questions given below.** **2×12=24**

3.1 Mention any one location of Cerebro Spinal Fluid and write one of its functions.

3.2 Write one function each of the following two parts of the eyeball –

- Cornea
- Iris

3.3 What role does Progesterone play when pregnancy is initiated ?

3.4 What are the purposes of sneezing and coughing respectively in our daily life ?

3.5 Write the successive stages of sporophytic and gametophytic phases in the alternation of generation of fern in a table.

3.6 Present the process of sexual reproduction of flowering plants with the help of a word diagram.

3.7 Show the chemical components of chromosome with the help of a table.

(Contd.)

3.8 Explain the following two terms related to heredity
- Locus
- Allele

3.9 Evaluate father's role in determining sex of the children in humans with the help of a cross.

3.10 If a female, who is a carrier of colour blindness marries a male with a normal colour vision and if one son and one daughter are born to them, show with the help of a cross the probability of colour blindness to be expressed in each of the son and daughter.

3.11 Explain the role of salt gland for salt tolerance in Sundari Plant.

3.12 Explain the following two tenets as mentioned in Darwin's Theory of Evolution –
- Prodigality of production (or reproduction)
- Natural selection

3.13 How does the honey bee express the location of the source of food in respect of the location of the beehive and of the sun through its Waggle dance ?

3.14 Write one effect of Sound Pollution each on human health and on the living world.

3.15 "One of the environmental crises affecting the Sunderbans is pollution" – Identify four sources of pollution in the Sunderbans.

3.16 Mention two problems which may arise if nitrogen cycle gets hampered.

3.17 Explain the respective strategies of conservation of each of the Crocodile and Red Panda.

Group 'D'

4. **Write all the 6 questions or their alternatives given below. Visually challenged candidates have to answer Question No. 4.1 (A) instead of Question No. 4.1. The marks allotted for each question are 5 (the division of marks is either 3+2, 2+3 or 5).** **5×6=30**

4.1 Draw a scientific diagram of human neuron and label the following parts :
(a) Schwann cell
(b) Dendrite
(c) Myelin Sheath
(d) Node of Ranvier **3+2=5**

OR

Draw a scientific diagram of an eukaryotic chromosome and label the following parts :
(a) Chromatid
(b) Primary constriction
(c) Nucleolar organizer
(d) Telomere **3+2=5**

(Contd.)

4.1 (A) **(ONLY FOR VISUALLY CHALLENGED CANDIDATES)**

Write one function each of the following parts of a neurone :

(a) Dendron
(b) Axon
(c) Myelin Sheath
(d) Node of Ranvier
(e) Schwann cell. **1×5=5**

OR

Describe one structural feature each of the following parts of an eukaryotic chromosome :

(a) Chromatid
(b) Primary constriction
(c) Nucleolar organiser
(d) Satellite
(e) Telomere. **1×5=5**

4.2 Describe five modes of asexual reproduction of living world with proper examples. **1×5=5**

OR

Write differences between Mitosis and Meiosis on the following three features :

- Site of occurrence
- Nature of division of chromosome
- Number of cells produced

How is the vegetative propagation of *Bryophyllum* accomplished ? **3+2=5**

4.3 Explain the incomplete dominance in respect of petal colour of *Mirabilis jalapa* flower. If a haemophilic female marries a normal male and two sons are born to them then what would be the percentage probability of occurrence of haemophilia among these two sons ? **3+2=5**

OR

State the law derived from the results of Mendel's dihybrid cross. If the genotype of a pure tall and round seeded pea plant is TTRR and the genotype of a pure dwarf and wrinkle seeded pea plant is ttrr, then write the phenotypes produced, their phenotypic ratio and the respective genotypes of each phenotype produced in F_2 generation. **2+3=5**

(Contd.)

4.4 Describe Miller-Urey Experiment on the biochemical origin of life and mention its significance. Explain the following two terms :

- Hot Dilute Soup
- Coacervate

3+2=5

OR

Describe two strategies of problem-solving abilities of the Chimpanzee regarding procurement of food. Explain the phenomenon of lengthening of the neck of the giraffe with the help of Darwin's Theory of Evolution. 2+3=5

4.5 Represent the nitrogen cycle with the help of a word diagram. Write two sources each of suspended particulate matter and greenhouse gases with the help of a table. 3+2=5

OR

Describe any five problems arising as a result of ever-increasing population. 1×5=5

4.6 Explain the following three causes related to the depletion of biodiversity :

- Destruction of habitat
- Poaching
- Pollution

Write the role of joint forest management in conservation of biodiversity. 3+2=5

OR

"The environmental crisis of the Sundarbans is the disruption of the numerical balance of the preys and predators". – Explain the problem with the help of three examples. Write the structural components of a biosphere reserve and give one example of biosphere reserve. 3+2=5