

West Bengal Board of Secondary Education, Nivedita Bhaban, DJ-8, Sec : II, Karunamoyee,  
Salt Lake, Kolkata : 700091

## **LIFE SCIENCE**

**[English Version]**

**NEW SYLLABUS**

For **Regular Candidates**, the questions of group 'A', 'B', 'C' and 'D' will have to be answered.

### **Special Instruction for Sightless Candidates**

In Group 'D' instead of Question No. 4.1, 4.1(A) will have to be answered.

For **External Candidates**, the questions of Group 'E' will also have to be answered in addition to Group 'A', 'B', 'C' and 'D'.

Instructions regarding the number of questions to be attempted have been indicated at the beginning of each group.

Group - A (Multiple Choice Questions)  
(Answer to all questions is Compulsory)

Total marks  $1 \times 15 = 15$

**1. Write the answer in complete sentence by choosing the correct answer for each question with respective serial number. Mark for each question is 1.**

1.1 The leaves of **Mimosa** plant drops down if touched. This is

- (a) Chemonasty
- (b) Seismonasty
- (c) Phototropism
- (d) Phototactic movement

Sample answer of MCQ :

1.1.(b) : The leaves of **Mimosa** plant drops down if touched. This is Seismonasty.

1.2 Which hormone is secreted at a faster rate while a person is frightened

- (a) GH
- (b) GTH
- (c) Thyroxine
- (d) Adrenaline

Sample answer of MCQ :

1.2.(d) : Adrenaline hormone is being secreted at a faster rate while a person is frightened.

1.3 The part of the brain associated with maintaining balance of the body is

- (a) Medulla Oblongata
- (b) Thalamus
- (c) Cerebellum
- (d) Cerebrum

1.4 You have not observed the formation of any spindle fibre during the division of a cell. This type of division is called

- (a) Amitosis
- (b) First Meiotic Division
- (c) Second Meiotic Division
- (d) Mitosis

1.5 For propagation in lesser time of a plant having prolonged period of dormancy of seed, which of the following processes you will adopt

- (a) Sexual reproduction
- (b) Fragmentation
- (c) Regeneration
- (d) Micropropagation

- 1.6 The phase of human development when memory and vision start to become weaker normally, is
- (a) Childhood
  - (b) Adolescence
  - (c) Old age
  - (d) New born
- 1.7 Who of the following scientists discovered the laws of heredity by using breeding experiment
- (a) Jean Baptist de Lamarck
  - (b) Gregor Johann Mendel
  - (c) Charles Darwin
  - (d) Stanley Miller
- 1.8 How many types of gametes are formed from guineapig having genotype Bbrr
- (a) 2
  - (b) 3
  - (c) 1
  - (d) 4
- 1.9 What would be the probability of a thalassemic child born to a couple who are both carrier for Thalassemia
- (a) 100%
  - (b) 25%
  - (c) 75%
  - (d) 50%
- 1.10 Which of the following sequence is correct in the evolution of horse
- (a) Eohippus → Merychippus → Equus → Pliohippus → Mesohippus
  - (b) Equus → Pliohippus → Merychippus → Mesohippus → Eohippus
  - (c) Merychippus → Mesohippus → Eohippus → Equus → Pliohippus
  - (d) Eohippus → Mesohippus → Merychippus → Pliohippus → Equus
- 1.11 Which of the following is the feature of homologous organs
- (a) Differ in origin
  - (b) Completely different in structure
  - (c) Differ in function but of common origin
  - (d) Indicates convergent evolution
- 1.12 The cause of Camel's ability to withstand excess loss of water is
- (a) Their RBC is elongated
  - (b) Their faeces and urine contain very little water
  - (c) Their body bears many sweat glands
  - (d) Their hump stores water

- 1.13 The identifying feature of the step called nitrification in the nitrogen cycle is
- Formation of ammonia by decomposition of proteins in dead organisms
  - Conversion of ammonia initially into nitrite and later into nitrate
  - Formation of nitrogen from nitrate
  - Formation of ammonia from nitrogen
- 1.14 The location of Sundaland biodiversity hotspot is at
- The state of Meghalaya and Arunachal Pradesh in North-East India
  - The islands of Andaman-Nicobar along with Sumatra and Java
  - The densely forest covered mountain region along the West Coast of India
  - In the region of Sikkim, Darjeeling and Terai
- 1.15 The cause of endangeredness of Swarpagandha is
- Global warming and climate change
  - Invasion of exotic species
  - Over-exploitation
  - Pollution

### **Group - B (Very Short Answer type Questions)**

**Total marks 1×21=21**

- 2. Answer any twenty one questions out of twenty six questions given below as instructed. The mark for each question is 1**

**Fill-up the blanks with proper words in the following sentences (Any five) 1×5=5**

- 2.1 The length of internode of genetically dwarf plant increases due to the action of \_\_\_\_\_ hormone.
- 2.2 The example of Pyrimidine nitrogenous base is \_\_\_\_\_.
- 2.3 Alternative forms of a gene are called \_\_\_\_\_.
- 2.4 Evolution occurs only when \_\_\_\_\_ are present in a population.
- 2.5 Maximum biodiversity rich region is called as \_\_\_\_\_.
- 2.6 Excessive increase of nutrients in water bodies is called \_\_\_\_\_.

**Decide whether the following statements are true or false (any five) 1×5=5**

- 2.7 Node of Ranvier is formed due to discontinuation of neurilemma in nerve cell.
- 2.8 Spindle fibres are formed from astral rays during animal cell division.
- 2.9 Homozygote is produced from the union of (T) and (t) gametes.
- 2.10 Ammonia, Hydrogen and Methane were used in the experiment on the bio-chemical origin of life by Miller and Urey.

- 2.11 SO<sub>2</sub> and NH<sub>3</sub> are two greenhouse gases.  
 2.12 Flexor muscles help to come two adjacent bones closer.

**Match the words in column A with those which are most appropriate in column B and re-write the correct pairing mentioning the serial no. of both column (Any five) 1×5=5**

Column A	Column B
2.13 Binocular vision	(a) Struggle between deer and tiger
2.14 Microtubule	(b) Bronchitis
2.15 Incomplete dominance	(c) Need of pollinating agent
2.16 Inter specific struggle	(d) Both the eyes are used to see the same object
2.17 Air Pollution	(e) Wastage of pollen grains is quite less
2.18 Cross Pollination	(f) forms spindle fibre during cell division
	(g) 1 : 2 : 1

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

- 2.19 Choose the odd one and write it : ADH, Glucose metabolism, Constriction of blood vessels, Reabsorption of water in renal in tubules.
- 2.20 What type of lens is used for correction of defect in case of Myopia?
- 2.21 Given below a pair of related terms. Write suitable word in the gap of second pair, following the relationship in the first pair.  
 Bryophyllum : Leaf bud : : Water hyacinth : .....
- 2.22 Why woman is called homogametic sex?
- 2.23 What is the relation between phenotype and genotype?
- 2.24 Write any one of the roles air sacs play in the aerial adaptation of pigeon.
- 2.25 Among the following four terms one includes the other three. Find out that term and write it :  
 Sanctuary, *In-situ* Conservation, National Park, Biosphere reserve
- 2.26 Write the name of a denitrifying bacteria.

### Group - C (Short Answer type Questions)

**Total marks 2×12=24**

- 3. Answer in 2-3 sentences any 12 questions out of 17 questions given below . The mark for each question is 2.**
- 3.1 Write two differences between hormone and nervous system regarding their mode of functions.
- 3.2 Write two uses of synthetic artificial plant hormones in agriculture.
- 3.3 How the thyroxine hormone influences the blood vascular system and BMR in human body?

- 3.4 How does reflex action help in daily life of human being — Explain with two examples.
- 3.5 Show the phases of cell cycle with the help of a table or a flowchart.
- 3.6 Distinguish between mitosis and meiosis cell division based on the following features as directed :
  - Nature of chromosomal division
  - Number of daughter cells produced
- 3.7 Depict the alternation of generation in a fern with the help of a flowchart.
- 3.8 Explain inherited variations in human being with the help of two examples.
- 3.9 In the dihybrid experiment with sweet pea plants involving the characters - stem length and seed shape, F<sub>2</sub> generation produces nine tall and round seed plants. What could be the genotypes of them?
- 3.10 With the help of a cross show the way sex is determined in human being.
- 3.11 What do you mean by vestigial organ? Name one vestigial organ present in human body.
- 3.12 Mention two behavioural adaptations for problem solving in chimpanzees.
- 3.13 Mention two significances of fossils in evolutionary studies.
- 3.14 “Nitrogen Cycle is getting affected due to human activities” — State two phenomena to justify.
- 3.15 “Invasion by exotic species affects local biodiversity” – Explain with two examples.
- 3.16 Write one cause and one symptom of lung cancer in human being.
- 3.17 Propose two conservation measures that could be taken to increase the number of lions in Gir forest.

**Group - D (Long Answer type Question)**

**Total Marks 5×6=30**

**4. Write the 6 questions or their alternatives given below. Sightless candidates have to answer question no. 4.1(A) instead of question no. 4.1. The mark allotted for each question is 5 (the division of marks is either 3+2, 2+3 or 5)**

4.1 Draw a neat diagram of an ideal neuron and label the following parts :

- (a) Axon (b) Dendron (c) Myelin Sheath (d) Schwann Cell 3+2=5

**or,**

Draw the morphology of an ideal eukaryotic chromosome and label the following parts :

- (a) Chromatid (b) Centromere (c) Nucleolar Organizer (d) Telomere 3+2=5

**(For Sightless Candidates)**

4.1 (A) Write the names of structural parts of an ideal neuron. Write two differences in between axon and dendron. 3+2=5

**or,**

Write the names of structural parts found in the morphology of an ideal eukaryotic chromosome. What are the functions of centromere and telomere? 3+2=5

- 4.2 Write two differences of cytokinesis between plant cell and animal cell. Name three plant body parts where mitosis cell division occurs. 2 + 3 = 5

**or,**

Distinguish between asexual and sexual reproduction on the following three features —

- Number of Parents
- Production of gametes
- Nature of offspring

Write the names of two processes of asexual reproduction with examples. 3+2=5

- 4.3 Sometimes it is observed that both parents are normal. But they have a colour-blind son. Explain how this is possible with the help of a cross. 5

**or,**

Which three organs of human body are damaged in Thalassaemia disease? What is the role of genetic counselling in preventing hereditary diseases? 3 + 2 = 5

- 4.4 Explain with an example how a new species originate according to the theory of Darwin. 5

**or,**

What are 'hot dilute soup' and 'coacervate'? Discuss three adaptations of Sundari tree for salt tolerance. 2 + 3 = 5

- 4.5 Write one of the sources for greenhouse gases and SPM that cause air pollution. Give examples of biodiversity found in the hot spots of western ghat – Srilanka and Eastern Himalaya. 2 + 3 = 5

**or,**

Write three significances of biodiversity. Give examples of two ways over population of human affects biodiversity. 3 + 2 = 5

- 4.6 Explain the steps of Nitrogen Cycle with the help of a flow diagram. 5

**or,**

Mention two ill-effects of sound pollution on human being. Two of the environmental problems in Sunderbans are imbalance in the numbers of prey-predator and rise in the sea level. Explain their possible consequences. 2 + 3 = 5

### **Group - E**

**(Only for External Candidates)**

**(Very Short Answer type Question)**

5. **Answer any four questions.** **1×4=4**
- 5.1 Write one characteristic of life.
- 5.2 Name one animal on whom plants depend for their dispersal.
- 5.3 Give an example of a Prokaryotic Cell.

- 5.4 Write one function of Mitochondria.
- 5.5 Mention one feature of Striated muscle.

**Short Answer type Questions**

**6. Answer any three questions.**

**2×3=6**

- 6.1 Explain any one feature of living organism.
- 6.2 Write two differences between plant and animal.
- 6.3 What are the two functions of Parenchyma tissue?
- 6.4 Give two examples of connective tissue.



