

**S. N. KANSAGRA SCHOOL**  
**BIOLOGY (THEORY)**  
**Prelim examination 2014-2015**

**STD12**

*(Three hours)*

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Answer all questions in Part I and six questions in Part II, choosing two questions from each of the three sections A, B and C.

All working including rough work should be done on the same sheet as, and adjacent to, the rest of the answer.

The intended marks for questions or parts of questions are given in brackets [ ].

**Part II each point carries half mark.**

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**Part I**

*Answer all questions*

**Question 1**

**A. Answer briefly** **[4]**

1. What is the importance of natural selection in evolution?
2. Why is apoplastic pathway considered as the most important pathway?
3. What is the importance of nucellus?
4. What is the central dogma?

**B. Give a scientific term for** **[4]**

1. The viruses that infect the bacteria
2. The clumping together of antigens and antibodies
3. The inflorescence where the main axis is compressed and bears stalk-less flowers
4. Drooping of shoots and leaves when water loss is more than water uptake.

**C. Name the scientists associated with.** **[4]**

1. Obtained the fossil of *Archaeopteryx lithographica*
2. Coined the term “diffusion pressure deficit”
3. Discovered double fertilization
4. First invented the CT scan.

**D. Elaborate the following:** **[4]**

1. RUBISCO
2. SCID
3. PEP
4. EEG

**E. Choose the correct option (copy and write the answer with the alphabet):** **[4]**

1. Which of the following make use of radio waves?  
a. Ultrasound                      b. MRI                      c. sonography                      d. all of these

2. The secondary immune response is due to
  - a. Memory cells
  - b. clone cells
  - c. T cells
  - d. B cells
3. A codon contains
  - a. Two bases
  - b. two base pairs
  - c. three bases
  - d. three base pairs
4. A normal woman whose father was colour blind marries a normal man. Her sons would be
  - a. 75% colour blind
  - b. 50% colour blind
  - c. all normal
  - d. all colour blind

**Part II**  
**Section A**

*Answer any two questions*

**Question 2**

1. Give two differences between homology and analogy. [1]
2. What are coacervates? [1]
3. Name the scientist who discovered and one main feature of- [3]
  - a. *Homo erectus*
  - b. *Homo neanderthalensis*,
  - c. *Cromagnon man*

**Question 3**

1. Explain, "Ontogeny repeats phylogeny". Give two examples. [2]
2. Describe the experiment conducted to prove the abiogenesis of life. [3]

**Question 4**

1. Evolution shows progressive and retrogressive trends in organisms. Explain this on the basis of evolution of horse. [2]
2. Explain natural selection with the help of examples. [3]

**SECTION B**

*Answer any two questions*

**Question 5**

1. Give four differences between the vascular bundle of monocot and dicot stem. [2]
2. What is photophosphorylation? Give two differences between cyclic and non-cyclic photophosphorylation. [2]
3. What is ascent of sap? Describe the transpirational pull theory for ascent of sap. [3]
4. Define plasmolysis. With the help of a well-labeled diagram show plasmolysis and deplasmolysis. [3]

**Question 6**

1. Describe anatomical details of monocot root. [3]
2. Name and describe two types of fleshy fruits. [2]
3. What are photosynthetic pigments? Comment on its types. [2]
4. Describe the types of endosperm formation. [3]

**Question 7**

1. Discuss embryo formation in dicots. [3]
2. Differentiate between aggregate and multiple fruits. (two points) [1]
3. Define pollination. Give the adaptations of the flower and pollen for wind pollination. [3]
4. Give a graphic representation of the C3 cycle. [3]

## SECTION C

*Answer any two questions*

### Question 8

1. Give application of – a. ECG      b. MRI [2]
2. Describe the process of protein synthesis. [4]
3. State and explain the Mendel's laws of inheritance. Discuss a deviation of one law. [4]

### Question 9

1. Explain gene expression by induction. [3]
2. Describe Griffith's experiment. [2]
3. Name two bacterial diseases give its causative agent, main symptom and prevention. [3]
4. Discuss the action of T cells. [2]

### Question 10

1. In dogs, wirehair is due to a dominant gene (W) and smooth hair is due to its recessive allele (w).
  - a. If a homozygous wire-haired dog is mated with a smooth-haired dog, what type of offspring could be produced? (genotype and phenotype). [1]
  - b. What type of offspring could be produced in the F<sub>2</sub>? (genotype and phenotype) [1]
  - c. Two wire-haired dogs are mated. Among the offspring of their first litter is a smooth-haired pup. If these two wire-haired dogs mate again, what are the chances that they will produce another smooth-haired pup? What are the chances that the pup will be wire-haired? (Show Punnett square) [1.5]
  - d. A wire-haired male is mated with a smooth-haired female. The mother of the wire-haired male was smooth-haired. What are the phenotypes and genotypes of the pups they could produce? (Show Punnett square) [1.5]
2. Describe sex-linked inheritance with an example. [3]
3. What is Rh factor incompatibility? Describe in terms of blood transfusion and pregnancy. [2]