

## Preparatory Test Series in BIOLOGY for Class XII

## Chapters 1-2

Time: 90 min

Max. Marks: 40

**General Instructions:** This paper contains 19 questions. All questions are compulsory. There is no choice for any question. Q1-6 carry 1 mark each, Q7-13 carries 2 mark each, Q14-18 carries 3 mark each and Q19 carries 5 marks. Write answers as per marks allotted. Look for answers to the questions on page numbers marked after every question (after the exam is over).

- |     |  |   |                                 |
|-----|--|---|---------------------------------|
| 1.  | Name the asexual reproductive structure in<br>a) <i>Penicillium</i><br>b) Sponge   | $\frac{1}{2} + \frac{1}{2}$                           | P6<br>P7                        |
| 2.  | In diploid organisms, the gamete mother cells are called _____   | 1   | P11                             |
| 3.  | Coconut water in tender coconut is actually _____ (endosperm / early cotyledon / fruit)  | 1   | P35                             |
| 4.  | What are vegetative propagules? Name any one.  | $\frac{1}{2} + \frac{1}{2}$                           | P7                              |
| 5.  | Mention the function of filiform apparatus.  | 1   | P33                             |
| 6.  | Cleistogamous flowers produce assured seed set even in absence of pollinators. How?  | 1   | P28                             |
| 7.  | Write difference between menstrual cycle and Oestrus cycle.  | 1+1   | P9                              |
| 8.  | Match the following:<br>a) Homothallic<br>b) Heterothallic   | 1+1   | P11                             |
|     | i) Dioecious<br>ii) Monoecious   |   |                                 |
| 9.  | In <i>Chara</i> , the female sex organ is _____ and the male sex organ is _____.   | 1+1   | P12                             |
| 10. | a) Why are off-springs of oviparous animals at greater risk than off-springs of viviparous animals?<br>b) What is common between Turkey (bird) and honey bee which is unusual in sexually reproducing animals. | 1+1   | P16<br>P14                      |
| 11. | a) Pollen grains are tolerant to strong acids and high temperatures. What made it so?<br>b) Which area in the coat of the pollen grain this tolerance is absent?   | 1+1   | P23                             |
| 12. | How is Geitonogamy different from autogamy and Xenogamy?   | 1+1   | P27                             |
| 13. | Discuss on the devices which plants have developed to encourage cross pollination. (any two)   | 1+1   | p                               |
| 14. | Draw the structure of an anatropous ovule and label 6 parts.   | $\frac{1}{2} \times 6$                                | P25                             |
| 15. | a) Enlist the characteristics of flower favouring wind pollination.<br>b) Name two plants pollinated by wind.  | $\frac{1}{2} \times 4$<br>$\frac{1}{2} + \frac{1}{2}$ | P29                             |
| 16. | Write the steps you would follow to artificially hybridize your crop plants.   | 1X3   | P33                             |
| 17. | What happens to the following after fertilization:<br>Egg, Polar nuclei, Antipodal cells, Synergids, ovule, ovary  | $\frac{1}{2} \times 6$                                | P34                             |
| 18. | a) Explain the development of microspores in angiosperms.<br>b) Are microspores the male gametes? Justify?   | 2+1   | P22                             |
| 19. | Explain the following terms:<br>a) Polyembryony<br>b) Scutellum<br>c) Perisperm<br>d) Apomixis<br>e) Triple fusion   | 1X5   | P39<br>P35<br>P36<br>P38<br>P34 |

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DR. ABHIJIT SAHA

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## Preparatory Test Series in BIOLOGY for Class XII

## Chapters 3-4

Time: 90 min

Max. Marks: 40

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- |     |   |                             |        |
|-----|---|-----------------------------|--------|
| 1.  | a) Name the part of the fallopian tube closest to the ovary.  | $\frac{1}{2} + \frac{1}{2}$ | P45    |
|     | b) What are the finger like projections called?   |                             |        |
| 2.  | Why is timely detection and treatment of STDs uncommon in our country?  | 1                           | P63    |
| 3.  | What is lactational amenorrhea?   | 1                           | P60    |
| 4.  | Name two hormones produced by women only during pregnancy   | $\frac{1}{2} + \frac{1}{2}$ | P53    |
| 5.  | Why can't a second sperm fertilise the ovum?  | 1                           | P51    |
| 6.  | Why should human testis descend into the scrotum?   | 1                           | P43    |
| 7.  | What can be the possible ill effects of excessive use of contraceptives?  | 1+1                         | P62    |
| 8.  | a) What is MTP? How long is it safe?  | 1+1                         | P62    |
|     | b) Why has it been legalized in India?  |                             |        |
| 9.  | Explain the roles of hormone Oxytocin in human body?  | 1+1                         | P54    |
| 10. | Levels of Estrogen and Progesteron varies during the different phases of menstrual cycle. Show it graphically.    | 1+1                         | P50    |
| 11. | Explain the terms: Menarche, Antrum   | 1+1                         | P49,48 |
| 12. | Write serially the ducts in the mammary gland starting from Mammary lobes to lactiferous duct.                    | $\frac{1}{2} \times 4$      | P47    |
| 13. | Discuss the role played by the Government to create awareness among the people about reproduction related aspects | $\frac{1}{2} \times 4$      | P58    |
| 14. | Describe in brief the components of the male reproductive system in human.  | $\frac{1}{2} \times 6$      | P43    |
| 15. | Classify IUDs. Explain how they act?  | 1x3                         | P60    |
| 16. | State the important development which occurs during the following:  |                             |        |
|     | a) 2 <sup>nd</sup> month of pregnancy   |                             |        |
|     | b) 1 <sup>st</sup> trimester  | 1X3                         | P54    |
|     | c) 2 <sup>nd</sup> trimester  |                             |        |
| 17. | Explain the development of the zygote till implantation.  | $\frac{1}{2} \times 6$      | P53    |
| 18. | Draw and label the sectional view of seminiferous tubule  | 1+2                         | P47    |
| 19. | Explain the different methods (techniques) in ART. Why is it still not so common in our country?                  | 4+1                         | P64    |

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## Preparatory Test Series in BIOLOGY for Class XII

## Chapter 5: Principles of Inheritance and Variation

Time: 90 min

Max. Marks: 40

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1. If a dwarf plant (DD) is dominant over a tall plant, what will be the genotype of the tall plant? 1
2. Independent assortment can be observed in Monohybrid cross. Yes or No? 1
3. Name the organism which Morgan used for his experiments in genetics. 1 P83
4. What is the contribution of Alfred Sturtevant in Genetics? 1 P83
5. Substitution of Glutamic acid by \_\_\_\_\_ causes Hb<sup>S</sup> peptide in Sickle cell anaemia 1 P89
6. What is X- body? Who named it? ½+½ P85
7. What is the difference between Incomplete dominance and Co-dominance? 1+1
8. Mr. Ram has 'A' blood group and his wife is 'B'. Can their son be 'O'? Explain? 1+1
9. Name the scientists who rediscovered Mendel's Laws. 1+1
10. What similarities can you establish between the behavior of chromosomes during meiosis and Mendelian factors during inheritance? 1+1 P82
11. Geeta was solving some questions on Pedigree analysis. On one of her problems she remarked the inheritance to be 'autosomal and recessive' type. What justification did she give? 1+1
12. What is the cause of Klinefelter's syndrome? Write two major symptoms. 1+1 P91
13. In grass hopper, sex determination is XX-XO type. What does it mean? 1+1 P85
14. A Yellow round seeded (YyRr) pea plant is crossed with green wrinkled pea plant. 1X3
  - a) Name the type of cross.
  - b) What will be the phenotypic ratio?
  - c) Show the cross with a diagram.
15. a) Skin colour in human is a polygenic trait. What does it mean? 1X3 P287  
 b) What is the relation between Linkage and Recombination? P83  
 c) Analysing a cross it was observed that the frequency of recombination between genes A and B was 98%. Comment upon the distance between the two genes. P83
16. A couple having normal vision gave birth to a son having colour blindness (sex linked disease). On investigation, it was discovered that the gene was inherited from the child's grandparent (mother side). Justify showing a proper cross. 1X3 P289
17. Explain why Mendel's laws were not acknowledged during presentation of the results of his experiments. 1x3 P81
18. Explain how ABO blood grouping in human can be an example of Multiple allelism and co-dominance? 2+1 P77
19. a) What is a pleiotropic gene? 1X5 P288  
 b) Write the genotypes of possible gametes formed from YyRR.  
 c) What are mutagens? Name one mutagen. P87  
 d) Write the symbol to show consanguineous mating in a pedigree chart. P88  
 e) Explain Trisomy-21 P91

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## Preparatory Test Series in BIOLOGY for Class XII

## Chapter 6: Molecular basis of Inheritance

Time: 90 min

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- |     |  |                           |        |
|-----|--|---------------------------|--------|
| 1.  | How RNA is different from DNA in terms of Nitrogenous bases present in them?               | 1                         | P96    |
| 2.  | What is semi-conservative DNA replication?   | 1                         | P104   |
| 3.  | Name the amino acids whose codons are AUG, UAG   | $\frac{1}{2}+\frac{1}{2}$ | P112   |
| 4.  | How are nucleosides in a polynucleotide linked?  | $\frac{1}{2}+\frac{1}{2}$ | P96    |
| 5.  | Define Okazaki fragments.  | 1                         |        |
| 6.  | Name the largest known human gene. How many bases does it have?                            | $\frac{1}{2}+\frac{1}{2}$ | P120   |
| 7.  | How is the 3' and 5' end of a polynucleotide determined?                                   | 1+1                       | P97    |
| 8.  | Draw and label the structure of a Nucleosome.  | 1+1                       | P99    |
| 9.  | The length of DNA double helix of a typical mammalian cell is 2.2m. How was it calculated? | 1+1                       | P99    |
| 10. | How is Transcription different from Replication of DNA?                                    | 1+1                       | P106-7 |
| 11. | Explain the process of gene splicing.  | 1+1                       | P110   |
| 12. | Mention the roles of Sigma factor and Rho factor in transcription.                         | 1+1                       | P109   |
| 13. | How does Hersey & Chase's experiment confirm DNA as genetic material?                      | 1+1                       | P102   |
| 14. | Genetic code is a triplet of bases. How was it established?                                | 1x3                       | P111   |
| 15. | One of the DNA strand is written as 3'ATGCATTAGCTTAGGCATGGTA5'                             | 1+2                       |        |
|     | a) How many amino acids will it code for?  |                           |        |
|     | b) What will be the sequence of bases on the mRNA?   |                           |        |
| 16. | Mention the criteria that one should possess to be a genetic material.                     | 1X3                       | P103   |
| 17. | Explain how Lac Operon operates.   | $\frac{1}{2}$ X6          | P117   |
| 18. | Match the following: Draw lines without making one common point of crossing                | $\frac{1}{2}$ X6          |        |
- | Group-A            | Group-B                           |
|--------------------|-----------------------------------|
| Friedrich Miescher | X ray crystallography             |
| Wilkins & Franklin | Amino acid sequencing             |
| Chargaff           | Triplet codon                     |
| Messelson & Stahl  | Base pairing rule                 |
| George Gamow       | Semi conservative DNA Replication |
| Sanger             | Nuclein                           |
- |     |  |     |      |
|-----|--|-----|------|
| 19. | f) Genetic code is degenerate. What does it mean?  | 1X5 | P112 |
|     | g) Why is DNA a better option than RNA as genetic material?  |     | P103 |
|     | h) What is the difference between Euchromatin and Heterochromatin.   |     | P100 |
|     | i) Write two applications of DNA fingerprinting.   |     | P121 |
|     | j) In Griffith's experiment, why did the mouse injected with mixture of heat killed bacteria with living R type die? |     | P100 |

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## Preparatory Test Series in BIOLOGY for Class XII

## Chapters 7, 8

Time: 90 min

Max. Marks: 40

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- |     |  |      |      |
|-----|--|------|------|
| 1.  | Name the reptile which went back into water and evolved into fish like reptile.  | 1    | P140 |
| 2.  | Name the pathological test to confirm that a patient is suffering from typhoid.  | 1    | P147 |
| 3.  | Mention two genera of fungi causing ringworm in human.   | ½+½  | P149 |
| 4.  | Name two essential compatibility tests to be performed before undertaking any organ grafting or transplantation.             | ½+½  | P152 |
| 5.  | What are interferons?  | 1    | P151 |
| 6.  | Give example of analogous organs in plants.  | 1    | P131 |
| 7.  | How did Pasteur dismiss the concept of 'Spontaneous generation' once and for all?  | 1+1  | P127 |
| 8.  | What does 'fitness' mean to Darwin? Explain.   | 1+1  | P129 |
| 9.  | Differentiate between primary and secondary lymphoid organs.   | 1+1  | P154 |
| 10. | Write the ill effects of drug abuse on women health.   | ½ X4 | P162 |
| 11. | Homology indicates common ancestry. How?   | 1+1  | P130 |
| 12. | What are 'Darwin's Finches'? What relation does it have with adaptive radiation?   | 1+1  | P133 |
| 13. | What is allergy? Name the drugs which can quickly reduce the effect of allergy.  | 1+1  | P153 |
| 14. | Explain in brief the concept of origin of life as explained by Oparin and Haldane.   | ½ X6 | P127 |
| 15. | How does 'Industrial melanism' support Natural selection?  | 1X3  | P132 |
| 16. | Show the steps (in flow chart preferably) how HIV establishes inside human body  | ½ X6 | P156 |
| 17. | Draw a brief outline showing the life cycle of Plasmodium causing malaria in human.  | ½ X6 | P146 |
| 18. | Fill in the blanks:  | ½ X6 |      |
|     | a) Heroin is commonly called _____ and its chemical name is _____  |      | P158 |
|     | b) Cocaine is obtained from _____ and is usually _____ (how used).   |      | P159 |
|     | c) Certain drugs like LSD and Morphine also used as medicines. The full form of LSD is _____ while morphine is used as _____ |      | P159 |
| 19. | k) How does Darwinism differ from De Vries theory on the role of mutation in evolution of life?                              | 1X5  | P135 |
|     | l) What is genetic drift?  |      | P137 |
|     | m) State 'Hardy-Weinberg Principle.  |      | P136 |
|     | n) How far are genes responsible for causing cancer?   |      | P157 |
|     | o) Name the two types of acquired immune response in human body.   |      | P151 |

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## Preparatory Test Series in BIOLOGY for Class XII

## Chapters 9, 10

Time: 90 min

Max. Marks: 40

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1. Large holes are found in Swiss cheese. Why? 1 P181
  2. Name the common Indian species of bee reared in apiculture? 1 P169
  3. Resistance to yellow mosaic virus in bhindi was transferred from its wild variety to produce a new variety of bhindi. Name the variety. 1 P174
  4. What are biofertilizers? 1 P188
  5. How was *Hisardale* (sheep) developed? 1 P168
  6. Define micropropagation. 1 P177
  7. As a manager of a dairy farm, mention any four important of dairy management which you would give top priority. ½X4 P166
  8. Why continuous inbreeding results into depression or loss of vigour? 1+1 P167
  9. Ravi's father was upset with their cow giving less milk. Ravi a student of Biology suggested his father to undertake a breeding programme. The next calf was a superior one. What type of cross did he suggest? Explain. 1+1 P168
  10. As a part of a plant breeding programme, the teacher suggested the group to begin with Germplasm collection. What does it mean? 1+1 P171
  11. What is Biofortification? Why is the term Single cell protein a misnomer? 1+1 P176
  12. Give examples of pest and diseases controlled by Biological means. 1+1 P187
  13. Classify the following as Distilled and non- distilled alcoholic beverages: ½ X4 P182  
Wine whisky, beer, Brandy
  14. Write the steps of MOET. ½ X6 P168
  15. Explain the secondary treatment of sewage in STP. What is the use of activated sludge? 2½ + ½ P184
  16. a) What is the difference between Pisciculture and aquaculture? 2+1  
b) Who is the father of Green revolution?
  17. a) Write the advantages of artificial insemination.  
b) Give an example of interspecific hybridization. ½ X6
  18. Complete the following table: 2+1 P183
- | Organism                  | Product        | Use                              |
|---------------------------|----------------|----------------------------------|
| <i>Streptococcus</i>      | A              | Clot buster                      |
| B                         | Cyclosporin -A | Immunosuppressant                |
| <i>Monascus purpureus</i> | C              | Blood cholesterol lowering agent |
19. a) Why are bottled fruit juice clearer than the domestic one? 1X5 P183  
b) Why detergent companies claim today the ability of their detergent to remove oily stains? P183  
c) How does LAB increase nutritional quality of food by converting milk into curd? P181  
d) Why cattle dung is commonly used to produce biogas? P185  
e) How mycorrhiza acts as biofertilizer? P188

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## Preparatory Test Series in BIOLOGY for Class XII

## Chapters 11-12

Time: 90 min

Max. Marks: 40

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- |     |   |                           |      |
|-----|---|---------------------------|------|
| 1.  | Name the two core techniques that gave birth to modern biotechnology.   | $\frac{1}{2}+\frac{1}{2}$ | P193 |
| 2.  | What are molecular 'scissors'?  | 1                         | P195 |
| 3.  | Name the organism also known as Natural Genetic Engineer.   | 1                         | P200 |
| 4.  | Why can't DNA polymerase be used in PCR?  | 1                         | P203 |
| 5.  | Expand ELISA.   | 1                         | P212 |
| 6.  | Transgenic animals are developed to obtain biological products. Name any two such products.   | $\frac{1}{2}+\frac{1}{2}$ | 213  |
| 7.  | What would be the fate of a piece of DNA when somehow transferred into an alien organism?   | 1+1                       | P194 |
| 8.  | ECorI is a Restriction Endonuclease. Explain how RE are named and justify its application in this enzyme.   | $\frac{1}{2} \times 4$    | P195 |
| 9.  | Draw diagram to show a) sticky end and b) Blunt end in a DNA cut by Restriction enzymes.  | 1+1                       | P196 |
| 10. | What is the principle which enables separation of DNA fragments in gel electrophoresis?   | 1+1                       | P198 |
| 11. | What is a bioreactor? Name two types of bioreactors studied.  | 1+1                       | P204 |
| 12. | How does Bt toxin (insecticidal protein) act on bollworms?  | 1+1                       | P208 |
| 13. | Initially scientists faced a lot of problem in obtaining the mature form of insulin through biotechnology methods. What was the problem? How was it solved? | 1+1                       | P211 |
| 14. | Draw a flow chart showing steps in Recombinant DNA technology   | $\frac{1}{2} \times 6$    | P197 |
| 15. | How is an alien DNA inserted into a cell?   | 1X3                       | P200 |
| 16. | Name the steps in PCR mentioning the major events in each step.   | 1X3                       | P202 |
| 17. | Explain the concept of RNA interference which was used to control <i>Meloidogyne</i> in tobacco roots.  | $\frac{1}{2} \times 6$    | P209 |
| 18. | Taking SCID (ADA deficiency) as an example, explain Gene therapy.   | $\frac{1}{2} \times 6$    | P211 |
| 19. | a) What is a plasmid?   | 1X5                       | P198 |
|     | b) Why should 'ori' be present in a vector?   |                           | P199 |
|     | c) What is the role of selectable marker in a plasmid?  |                           | P199 |
|     | d) Why multiple cloning sites are not conducive for a cloning vector?   |                           | P199 |
|     | e) Define 'Insertional inactivation'.   |                           | P200 |

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## Preparatory Test Series in BIOLOGY for Class XII

## Chapters 13-14

Time: 90 min

Max. Marks: 40

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1. The age pyramid of this state shown declining pyramid. What does it represent? 1 P227
  2. What can be reason for success of mammals to thrive in any environment on earth? 1 P224
  3. Most of the fresh water animals cannot survive in sea water. Why? 1 P222
  4. In a village there were 20 children last year. This year the total rose to 28. Calculate the birth rate.  $\frac{1}{2} \times \frac{1}{2}$  P227
  5. Define: Competitive Exclusion principle. 1 P235
  6. What is Net Primary productivity? 1 P243
  7. Heat loss or heat gained in a function of surface area. How can you apply this concept over animals found in polar regions? 1+1 P224
  8. Explain a) Allen's rule b) Altitude sickness 1+1 P226
  9. What is Competitive release? Cite Connell's field experiment as an example. 1+1 P235
  10. Under what conditions can ecological pyramids be inverted? 1+1 P249
  11. Mediterranean Orchid *Ophrys* employs 'Sexual deceit'. Why? 1+1 P238
  12. Predators play an important role in ecosystem other than being conduits of energy transfer. Explain. 1+1 P233
  13. Mention the four basic processes which causes change in population size.  $\frac{1}{2} \times 4$  P228
  14. Explain the process of decomposition.  $\frac{1}{2} \times 6$  P243
  15. With a schematic diagram show the phosphorus cycle in terrestrial ecosystem.  $\frac{1}{2} \times 6$  P255
  16. Differentiate between Exponential and Logistic growth. Draw graph and mathematical interpretations. 1X3 P229-231
  17. Match the following: Type of Interaction with examples.  $\frac{1}{2} \times 6$  P232
- | Type of Interaction | Examples   |
|---------------------|--|
| Mutualism           | Tiger and deer   |
| Competition         | A bacteria producing antibiotic to kill other bacteria |
| Predation           | Abingdon tortoise and goat                             |
| Parasitism          | Fungi and roots in higher plants                       |
| Commensalism        | Human and <i>Plasmodium</i>                            |
| Amensalism          | Cattle egret and grazing cattle                        |
18. Describe the steps in succession occurring in a pond.  $\frac{1}{2} \times 6$  P252
  19.
    - a) What is Resource partitioning? 1X5 P235
    - b) What is 10% law in ecology terms? P247
    - c) What is 'Standing State' the term used in nutrient cycling? P253
    - d) What do you mean by Pioneer species? P251
    - e) What is a climax community? P250

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## Preparatory Test Series in BIOLOGY for Class XII

## Chapters 15-16

Time: 90 min

Max. Marks: 40

**General Instructions:** This paper contains 19 questions. All questions are compulsory. There is no choice for any question. **Q1-6** carry **1 mark** each, **Q7-13** carries **2 mark** each, **Q14-18** carries **3 mark** each and **Q19** carries **5 marks**. Write answers as per marks allotted. Look for answers to the questions on page numbers marked after every question (after the exam is over).

- |     |   |                           |      |
|-----|---|---------------------------|------|
| 1.  | Some ponds appears green due to growth of algae. What is this phenomenon called? What is the cause for it?              | $\frac{1}{2}+\frac{1}{2}$ | P275 |
| 2.  | Name ant two sub-species of tiger which experienced recent extinction.  | $\frac{1}{2}+\frac{1}{2}$ | P263 |
| 3.  | We find vehicles on road bearing BS-III or BS-IV sticker. What does it indicate?  | 1                         | P273 |
| 4.  | How is ozone hole formed?   | $\frac{1}{2}+\frac{1}{2}$ | P283 |
| 5.  | What are e-wastes?  | 1                         | P279 |
| 6.  | Ecosan is a bio friendly toilet. How?   | 1                         | P278 |
| 7.  | What made India one of the 12 mega-diversity countries of the world?  | 1+1                       | P261 |
| 8.  | How does pattern of Biodiversity change with latitudinal gradient? Give an example.                                     | 1+1                       | P261 |
| 9.  | Explain 'Rivet popper hypothesis'   | 1+1                       | P263 |
| 10. | What are the effects of biodiversity loss in a region?  | $\frac{1}{2} \times 4$    | P264 |
| 11. | Introduction of alien species causes loss to biodiversity. Justify with example.  | 1+1                       | P265 |
| 12. | What are the criteria considered for selecting an area to be a biodiversity hotspot?                                    | 1+1                       | p    |
| 13. | Explain the principle behind working of an electrostatic precipitator.  | 1+1                       | P271 |
| 14. | Explain Species-area relationship. Provide mathematical and graphical interpretation in support of your answer.         | 1X3                       | P262 |
| 15. | What role has the Government played to preserve and conserve biodiversity?  | $\frac{1}{2} \times 6$    | P266 |
| 16. | Compare the benefits of using CNG in public vehicles over conventional fuel.  | 1X3                       | P273 |
| 17. | A factory discharges sewage at a point 'X' in the river. Explain the changes occurring in water as it flows downstream. | $\frac{1}{2} \times 6$    | P275 |
| 18. | What is Bio magnification? Explain citing aquatic food chain.   | 1+2                       | P276 |
| 19. | a) Explain how Biologists of Humboldt University designed Integrated waste water treatment process in a natural system. | 3+2                       | P277 |
|     | b) Draw a pie-chart showing relative contribution of different green- house gases to total global warming.              |                           | P281 |

Thank you for answering this question paper. Take out your NCERT text book. Look for the answers. Grade yourself and find your expected marks. Don't be disheartened if it is below your expectation. Learn answers of all the questions given above. Next time your performance will be better.

Don't GIVE UP. No one can stop you other than \_\_\_\_\_ (your name).