

**BOTANY, PAPER-II**

**FEDERAL PUBLIC SERVICE COMMISSION  
COMPETITIVE EXAMINATION FOR  
RECRUITMENT TO POSTS IN BPS-17 UNDER  
THE FEDERAL GOVERNMENT, 2010**

Roll Number

**BOTANY, PAPER-II**

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|----------------------|---|-------------------------|
| <b>TIME ALLOWED:</b> | <b>(PART-I) 30 MINUTES</b>                | <b>MAXIMUM MARKS:20</b> |
|                      | <b>(PART-II) 2 HOURS &amp; 30 MINUTES</b> | <b>MAXIMUM MARKS:80</b> |

- NOTE: (i) First attempt PART-I (MCQ) on separate Answer Sheet which shall be taken back after 30 minutes.**  
**(ii) Overwriting/cutting of the options/answers will not be given credit.**

**PART – I (MCQ)**  
**(COMPULSORY)**

**Q.1. Select the best option/answer and fill in the appropriate box on the Answer Sheet. (20)**

- (i) NADH from the Krebs cycle is approximately equal to:  
 (a) 2 ATP (b) 3 ATP (c) 4 ATP  
 (d) 6 ATP (e) None of these
- (ii) In mitochondrial electron transport chains, the final electron acceptor is:  
 (a) H<sub>2</sub>O (b) H<sub>2</sub>O<sub>2</sub> (c) NAD<sup>+</sup>  
 (d) FAD (e) None of these
- (iii) The movement of water from cell to cell via plasmodesmata is called:  
 (a) Symplastic (b) Transmembrane (c) Apoplastic  
 (d) Facilitated (e) None of these
- (iv) In maize plant, the CO<sub>2</sub> fixation mechanism is called:  
 (a) C<sub>3</sub> pathway (b) C<sub>4</sub> pathway (c) CAM pathway  
 (d) C<sub>3</sub> – C<sub>4</sub> intermediate (e) None of these
- (v) Salt-loving plants are known as:  
 (a) Glycophytes (b) Halophytes (c) Xerophytes  
 (d) Mesophytes (e) None of these
- (vi) With the addition of solute to a liquid system, the water potential of the system:  
 (a) Increases (b) Decreases (c) Remains stable  
 (d) Remains variable (e) None of these
- (vii) The conversion of pyruvate into acetyl CoA is called:  
 (a) Glycolysis (b) Fermentation (c) Oxidative carboxylation  
 (d) B-Oxidation (e) None of these
- (viii) Between adenine and thymine, there are:  
 (a) Two hydrogen bonds (b) 3 hydrogen bonds (c) One hydrogen bond  
 (d) 4 hydrogen bonds (e) None of these
- (ix) The stage of meiosis in which pairing of homologous chromosomes starts is called:  
 (a) Leptotene (b) Zygotene (c) Diplotene  
 (d) Pachytene (e) None of these
- (x) The site of chromosome on which a gene is located is called:  
 (a) Allele (b) Locus (c) Site  
 (d) Trait (e) None of these
- (xi) In a dihybrid cross, the ratio of F<sub>2</sub> generation is:  
 (a) 9:3:3:1 (b) 3:1 (c) 1:2:1  
 (d) 1:1 (e) None of these
- (xii) When a single gene has multiple effects, the phenomenon is called:  
 (a) Codominance (b) Epistasis (c) Pleiotropy  
 (d) Genostasis (e) None of these
- (xiii) Lamarck's theory of evolution was published in:  
 (a) 1807 (b) 1808 (c) 1809  
 (d) 1810 (e) None of these
- (xiv) The book "Origin of Species" was written by:  
 (a) Linnaeus (b) Lamarck (c) Mendel  
 (d) Darwin (e) None of these

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- (xv) The interaction between algae and fungi to form lichen is called:
  - (a) Parasitism
  - (b) Mutualism
  - (c) Commensalism
  - (d) Amensalism
  - (e) None of these
- (xvi) The actual location or place where an organism lives is called:
  - (a) Habitat
  - (b) Ecosystem
  - (c) Niche
  - (d) Biome
  - (e) None of these
- (xvii) Which of the biomes has been increased in area by human activities?
  - (a) Savanna
  - (b) Grassland
  - (c) Desert
  - (d) Coniferous forest
  - (e) None of these
- (xviii) Which zone of the lake ecosystem consists of phyto-and zoo-planktons?
  - (a) Littoral zone
  - (b) Limnetic zone
  - (c) Profundal zone
  - (d) Water deep layers
  - (e) None of these
- (xix) Which of the following is a biotic component of an ecosystem?
  - (a) Producers
  - (b) Consumers
  - (c) Decomposers
  - (d) All of these
  - (e) None of these
- (xx) A sequence of changes in the community structure of an ecosystem over a period of time is called:
  - (a) Natural selection
  - (b) Succession
  - (c) Neo-Darwinism
  - (d) Lamarckism
  - (e) None of these

**PART – II**

|              |  |
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| <b>NOTE:</b> | <ul style="list-style-type: none"> <li>(i) <b>PART-II</b> is to be attempted on the separate <b>Answer Book</b>.</li> <li>(ii) Attempt <b>ONLY FOUR</b> questions from <b>PART-II</b>. All questions carry <b>EQUAL</b> marks.</li> <li>(iii) Extra attempt of any question or any part of the attempted question will not be considered.</li> </ul> |
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- Q.2.** (a) What is Oxidative phosphorylation? How does it take place on the mitochondrial membrane and how is it associated with the synthesis of metabolic energy? **(10)**
- (b) What is pigment? Give the structures and chemical composition of all plant pigments involved in photosynthesis. **(10)**
- Q.3.** Describe the structure, transport, biosynthesis and mode of action of Auxins. **(20)**
- Q.4.** (a) Differentiate between Dark Respiration and Photo-respiration. **(10)**
- (b) Describe the salient effects of water-logging on plants. **(10)**
- Q.5.** What is Ecosystem? How is its composition affected by different environmental factors? **(20)**
- Q.6.** Write notes on the following: **(10 x 2)**
  - (i) Genetic code
  - (ii) Gene transformation
- Q.7.** (a) What are major factors which affect the evolution of a trait? **(10)**
- (b) Describe Ecological Energetics. **(10)**
- Q.8.** Write short notes on **ANY TWO** of the following: **(2 x 10)**
  - (i) Photoperiodism
  - (ii) Ultra-structure of chloroplast
  - (iii) Conservation of Natural resources

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