

**BOTANY, PAPER-I**

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

Roll Number

**BOTANY, PAPER-I**

<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) The Green Algae belongs to:  
 (a) Cyanochloranta (b) Chlorophycophyta (c) Charophyta  
 (d) Cryptophycophyta (e) None of these
- (ii) If the gametes and gametangia in Fungi are of unequal size, they are termed as:  
 (a) Heterothallic (b) Homothallic (c) Isogametes  
 (d) Anisogametes (e) None of these
- (iii) Chlorophyll 'd' exists in:  
 (a) Pyrrophyta (b) Phaeophyta (c) Cryptophyta  
 (d) Rhodophyta (e) None of these
- (iv) Which of the type of chlorophyll is rare in Xanthophyceae and has been determined in only two of its genera:  
 (a) chlorophyll 'a' (b) chlorophyll 'e' (c) chlorophyll 'b'  
 (d) chlorophyll 'd' (e) None of these
- (v) The Axoneme in an algal filament is composed of \_\_\_\_\_ fibrils:  
 (a) five (b) seven (c) eleven  
 (d) one (e) None of these
- (vi) An antibiotic called "Chlorellin" is derived from:  
 (a) Chara (b) Spirogyra (c) Volvox  
 (d) Chlorella (e) None of these
- (vii) In Pakistan, Volvox is found abundantly in water ponds during the months of:  
 (a) March and April (b) May and June (c) November and December  
 (d) January and February (e) None of these
- (viii) Because of extracting \_\_\_\_\_ from water and depositing it in their walls different species of Chara are referred to as "Stone Worts":  
 (a) Sodium chloride (b) Calcium carbonate (c) Potassium sulphate  
 (d) Potassium nitrate (e) None of these
- (ix) Puccinia graminis causes \_\_\_\_\_ in wheat:  
 (a) Yellow or stripe rust (b) Brown or orange leaf rust (c) Black or stem rust  
 (d) Loose green smut (e) None of these
- (x) The zero and one stages of Puccinia graminis are produced on:  
 (a) Triticum aestivum (b) Hordeum Vulgare (c) Sorghum Vulgare  
 (d) Barberis Vulgaris (e) None of these
- (xi) A stable self-supporting association of a \_\_\_\_\_ is termed as lichen:  
 (a) bryophyte & a pteridophyte (b) mycobiont & a phycobiont (c) plant & animal  
 (d) gymnosperm & angiosperm (e) None of these
- (xii) Equisetum is the only living genus that belongs to:  
 (a) Sphenopsida (b) Caphalida (c) Chlorophycophyta  
 (d) Pteropsida (e) None of these
- (xiii) The genus Equisetum comprises about 25 species distributed world-over except in:  
 (a) Eurasia (b) North America (c) South America  
 (d) Australasia (e) None of these
- (xiv) The members of class Filicinae in pteridophyta date back to \_\_\_\_\_ era:  
 (a) Mesozoic (b) Paleozoic (c) Cenozoic  
 (d) Cambrian (e) None of these

## **BOTANY, PAPER-I**

- (xv) Marsilea quadrifolia belongs to the group of plants known as:  
(a) Lichens (b) Sedges (c) Ferns  
(d) Shrubs (e) None of these
- (xvi) \_\_\_\_\_ show marked affinities with both Pteridophytes and angiosperms:  
(a) Bryophytes (b) Hydrophytes (c) Gymnosperms  
(d) Epiphytes (e) None of these
- (xvii) \_\_\_\_\_ has five leaves in the spur:  
(a) Pinus longifolia (b) Pinus excelsa (c) Pinus roxberghii  
(d) Pinus wallichiana (e) None of these
- (xviii) The resting period between pollination and fertilization in Taxus baccata may be:  
(a) Five to ten months (b) Two to three months (c) One to two months  
(d) Ten to eleven months
- (xix) In Ephedra, the oospore undergoes repeated divisions to produce eight-celled:  
(a) Zygote (b) Zygosphere (c) Endosperm  
(d) Pro-embryo (e) None of these
- (xx) Double fertilization is a characteristic of:  
(a) Gymnosperms (b) Bryophytes (c) Angiosperms  
(d) Pteridophytes (e) None of these

### **PART – II**

<b>NOTE:</b>	<p>(i) <b>PART-II</b> is to be attempted on the separate <b>Answer Book</b>. (ii) Attempt <b>ONLY FOUR</b> questions from <b>PART-II</b>. All questions carry <b>EQUAL</b> marks. (iii) Extra attempt of any question or any part of the attempted question will not be considered.</p>
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- Q.2.** (a) Classify different groups of algae based on their habitat and pigmentation. (10)  
(b) Write a note on the Economic Importance of Chlorophyta. (10)
- Q.3.** Fungi have great impact on our national economy. Explain their constructive and destructive roles with a special emphasis on agriculture sector. (20)
- Q.4.** What are lichens? Explain how lichens are not only beneficial for humans but also for the entire universe? (20)
- Q.5.** (a) Explain the general characteristics of Bryophytes. (10)  
(b) Write a detailed note on mode of reproduction in Marchantia. (10)
- Q.6.** (a) Discuss the structure of strobilus and sporangia of Equisetum. (10)  
(b) Explain the major resemblances and differences between Gymnosperms and Pteridophytes. (10)
- Q.7.** Explain the mechanism of pollination, fertilization and development of seed as well as seed dispersal in Angiosperms. (20)
- Q.8.** Write short notes on **ANY TWO** of the following: (2 x 10)  
(i) Rules of botanical nomenclature  
(ii) Chemo – taxonomy and Numerical taxonomy  
(iii) Concept of Speciation

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**BOTANY, PAPER-II**

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**BOTANY, PAPER-II**

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**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**

<b>NOTE:</b>	<p>(i) <b>PART-II</b> is to be attempted on the separate <b>Answer Book</b>. (ii) Attempt <b>ONLY FOUR</b> questions from <b>PART-II</b>. All questions carry <b>EQUAL</b> marks. (iii) Extra attempt of any question or any part of the attempted question will not be considered.</p>
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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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