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

BOTANY, PAPER-I

Roll Number

TIME ALLOWED:	**(PART-I) 30 MINUTES**	**MAXIMUM MARKS:20**
	(PART-II) 2 HOURS & 30 MINUTES	**MAXIMUM MARKS:80**

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

(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 Taxas 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 oosphore undergoes repeated divisions to produce eight-celled:
(a) Zygote (b) Zygosphore (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

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

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

****

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

BOTANY, PAPER-II

Roll Number

TIME ALLOWED:	**(PART-I) 30 MINUTES**	**MAXIMUM MARKS:20**
	(PART-II) 2 HOURS & 30 MINUTES	**MAXIMUM MARKS:80**

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 c acceptor is:
(a) H_2O (b) H_2O_2 (c) NAD^+
(d) FAD (e) None of these

(iii) The movement of water from cell to cell via plasmadesmata is called:
(a) Symplastic (b) Transmembrane (c) Apoplastic
(d) Facilitated (e) None of these

(iv) In maize plant, the CO_2 fixation mechanism is called:
(a) C_3 pathway (b) C_4 pathway (c) CAM pathway
(d) $C_3 – C_4$ 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 solution 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 C_0. A 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_2 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

(xv) The interaction between algae and fungi to form lichen is called:
(a) Parasitism (b) Mutalism (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

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

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

****