

**FEDERAL PUBLIC SERVICE COMMISSION**  
**COMPETITIVE EXAMINATION FOR RECRUITMENT TO POSTS**  
**IN BPS-17 UNDER THE FEDERAL GOVERNMENT, 2001.**

**ZOOLOGY, PAPER-I**

**TIME ALLOWED: THREE HOURS**

**MAXIMUM MARKS: 100**

**NOTE:** Attempt FIVE questions in all, including question No.7 which is **COMPULSORY**. Select at least **TWO QUESTIONS** from each of the **SECTIONS 'A' AND 'B'**. All questions carry **EQUAL** marks.

**SECTION 'A'**

- |      |     |   |   |
|------|-----|---|---|
| Q.1. | (a) | Briefly describe four different methods of ASEXUAL REPRODUCTION met in the PROTOZOA.                        | 7 |
|      | (b) | Give a brief account of different types of spicules found in PORIFERA.                                      | 7 |
|      | (c) | Define POLYMORPHISM. Discuss the phenomenon with reference to order SIPHONOPHORA (COELENTRATA).             | 6 |
| Q.2. | (a) | Write a short essay on affinities of CTENOPHORA.  | 6 |
|      | (b) | Discuss the general adaptation of parasitic mode of life with special reference to phylum PLATY HELMINTHES. | 7 |
|      | (c) | Give an account of two broad types of NEPHRIDIA found in POLYCHAETA.  | 7 |
| Q.3. | (a) | Define METAMORPHOSIS and discuss the phenomenon with reference to INSECTS.                                  | 7 |
|      | (b) | Write a short essay on TORSION in GASTROPODA.   | 7 |
|      | (c) | Discuss REGENERATION with special reference to ECHINODERMS.   | 6 |

**SECTION 'B'**

- |      |                                     |   |                       |
|------|-------------------------------------|---|-----------------------|
| Q.4. | (a)                                 | Discuss the possible origin of the CHORDATES.   | 7                     |
|      | (b)                                 | Give a brief account of the evolutionary changes in HEART indifferent classes of CHORDATES. | 7                     |
|      | (c)                                 | Write a short note on anatomy of the MAMMALIAN KIDNEY.                                      | 6                     |
| Q.5. | (a)                                 | Describe the two basic types of CLEAVAGE with reference to CHORDATES.                       | 7                     |
|      | (b)                                 | Write on essay on PLACENTATION IN MAMMALS.  | 6                     |
|      | (c)                                 | Develop an outline on adaptation of FLIGHT IN BIRDS.  | 7                     |
| Q.6. | Write short notes on the following: |   | 20                    |
|      | (a)                                 | CAUDAL FINS IN FISH   | (b) NOTOCHORD         |
|      | (c)                                 | VIVIPARITY  | (d) FEATHERS IN BIRDS |

**COMPULSORY QUESTION**

- Q.7. Write only the correct answer in the Answer Book. Do not reproduce the questions.
- (A) Which of the four options make the following statements correct. On your answer books just write the question number and one of the serial alphabets.



- (1) Insects are characterized by:
- (a) 3 pairs of legs (b) Two pairs of antennae  
(c) Wings on body (d) Large sized eggs  
(e) None of these.
- (2) Body is metamerically segmented in:
- (a) Porifera (b) Annelida  
(c) Coelentrata (d) None of these
- (3) Which of the following arthropod are totally aquatic:
- (a) Crustaceans (b) Insects  
(c) Millipedes (d) None of these
- (4) Dorsal tubular nerve cord is characteristic of:
- (a) some chordates (b) some non chordates  
(c) all non chordates (d) all chordates  
(e) None of these.
- (5) Opposable thumbs are characteristic feature of:
- (a) Lagomorpha (b) Primates  
(c) Edentata (d) None of these
- (6) Differences in the scales of fishes and reptiles lies in their being:
- (a) Endodermal and dry (b) Epidermal and dry  
(c) Epidermal and wet (d) Endodermal and wet  
(e) None of these.
- (7) Which of the following has oxygenated blood: \*
- (a) Renal veins (b) Pulmonary veins  
(c) Pulmonary artery (d) Hepatic portal veins  
(e) None of these.
- (8) Scapula is the bone of:
- (a) Skull (b) Pelvic girdle  
(c) Pectoral girdle (d) Vertebral column  
(e) None of these.
- (9) All the digestive are formed in vertebrates by:
- (a) Ectoderm only (b) Endoderm only  
(c) Mesoderm only (d) None of these
- (10) Ammonia is chief excretory product in:
- (a) Reptiles (b) Turtles  
(c) Mammals (d) Fish  
(e) None of these.
- (B). Check which of the following statements are true (T) or false (F). on your answer sheets just write the question number and T or F.
- (11) Coelome is lined by ectodermal epithelium.  
(12) Non-chordates are dissected from dorsal side.  
(13) All snakes are poisonous.  
(14) Mouth in sharks is located on anterior tips.  
(15) Frogs have 3 cervical vertebrae.  
(16) Contractile vacuole in protozoa is basically an excretory organ.  
(17) Nerve cord in chordates is Endodermal in origin.  
(18) Whale is the largest mammals living in sea.  
(19) Both male and female mosquitoes bite and carry parasite.  
(20) The gammules are produced in coelentrates.

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FEDERAL PUBLIC SERVICE COMMISSION

COMPETITIVE EXAMINATION FOR RECRUITMENT TO POSTS  
IN BPS-17 UNDER THE FEDERAL GOVERNMENT, 2001.

**ZOOLOGY, PAPER-II**

TIME ALLOWED: THREE HOURS

MAXIMUM MARKS: 100

NOTE: Attempt FIVE questions in all, including question No.8 which is  
COMPULSORY. All questions carry EQUAL marks.

1. Give an account of the following:
  - (a) Meiosis and its significance. (Marks 12)
  - (b) The role of Nucleic Acid in Protein Synthesis. (Marks 08)
2. Write short notes on: (Marks 5+5+5+5)
  - (a) Nucleolus.
  - (b) Lysosome.
  - (c) Chromosomal aberrations.
  - (d) Gene concept.
3. Give in detail the account of functions of various hormones produced by different lobes of Pituitary gland. (Marks 20)
4. Discuss in detail the relationship between ontogeny and Phylogeny. (Marks 20)
5. Give an account of sources, effects and control of Air Pollution. (Marks 20)
6. Give an account of: (Marks 12+8)
  - (a) Sex – linked inheritance.
  - (b) Linkage and crossing over.
7. Write short notes on: (Marks 5+5+5+5)
  - (a) Nitrogen cycle.
  - (b) Lateral line system.
  - (c) Respiratory pigments found in Animals.
  - (d) Erythrocytes.

**COMPULSORY QUESTION**

8. Write only the correct answer in the Answer Book. Don't reproduce the questions.
  - (1) Life originated during:
    - (a) Pre-cambrian period.
    - (b) Mesozoic era.
    - (c) Coenozoic era.
    - (d) Proterozoic era.
    - (e) None of these.
  - (2) Pancreas secrete:
    - (a) Pepsin
    - (b) Only hormones.
    - (c) Only enzymes.
    - (d) Both (b) and (c).
    - (e) None of these.
  - (3) Louis – Pasteur is known for:
    - (a) Germ theory of disease
    - (b) Germ plasm theory
    - (c) Mutation theory
    - (d) Cell theory
    - (e) None of these.

- (4) Life originated:  
(a) In Air (b) On land  
(c) In water (d) In all (a), (b) and (c).  
(e) In none of these.
- (5) Viruses are:  
(a) Unicellular (b) Acellular.  
(c) Multicellular (d) Free living.  
(e) None of these.
- (6) Wings of Insects and bats are examples of:  
(a) Homologous organs. (b) analogous organs  
(c) both (a) and (b). (d) vestigial organs.  
(e) None of these.
- (7) Archeopteryx is a connecting link between:  
(a) Amphibians and reptiles (b) Reptiles and birds  
(c) Birds and Mammals (d) Amphibians and birds  
(e) None of these.
- (8) Lamarck's theory of Evolution is based upon:  
(a) Effect of environment (b) Use and disuse of body parts.  
(c) Inheritance of Acquired characters (d) All of these  
(e) None of these.
- (9) Absorption of digested food occurs mainly in:  
(a) Colon (b) Small Intestine  
(c) Large Intestine (d) Stomach.  
(e) None of these.
- (10) A renal portal system is found in:  
(a) Man (b) Horse  
(c) Rabbit. (d) Frog.  
(e) None of these.
- (11) Tangoreceptors respond to:  
(a) Heat (b) Smell  
(c) Chemicals (d) Touch.  
(e) None of these.
- (12) Third ventricle is found in:  
(a) Brain of Rabbit. (b) Heart of Rabbit.  
(c) Kidney of Frog (d) Heart of Frog.  
(e) None of these.
- (13) Blood from glomerulus returns by:  
(a) Afferent renal arteriole. (b) Efferent renal arteriole.  
(c) Both of these. (d) Renal vein  
(e) None of these.
- (14) Vital morphological and Physiological units of Mammalian kidney are:  
(a) Ureters (b) Seminiferous tubules  
(c) Uriniferous tubules (d) All of these.  
(e) None of these.

- (15) Which of the following secrete Oxytocin:  
(a) Adrenals (b) Pituitary  
(c) Thyroid (d) Ovaries  
(e) None of these.
- (16) Longest cells in animals are:  
(a) Nerve cells (b) Egg cells  
(c) Kidney cells (d) Liver cells  
(e) None of these.
- (17) Function of centromere is to:  
(a) Initiate cell division (b) Inhibit cell division  
(c) Provide site for cell division (d) Do all of these  
(e) Do none of these.
- (18) Which of the following has extranuclear DNA:  
(a) Mitochondria. (b) Lysosomes  
(c) Golgi complex (d) All of these.  
(e) None of these.
- (19) Who gave laws of segregation and Dominance:  
(a) Mendel (b) Morgan  
(c) Darwin (d) Muller  
(e) None of these.
- (20) Adrenal glands are found in close association with:  
(a) Testes (b) Spleen  
(c) Liver (d) Ovaries  
(e) None of these.

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COMPETITIVE EXAMINATION FOR RECRUITMENT TO POSTS  
IN BPS-17, UNDER THE FEDERAL GOVERNMENT, 2002.

ZOOLOGY, PAPER-I

TIME ALLOWED: THREE HOURS

MAXIMUM MARKS: 100

Note: Attempt any FIVE questions in all, including Question No.7 which is  
COMPULSORY. Select two questions from each Section. All questions carry  
EQUAL marks.

SECTION - A

1. (a) Describe various modes of LOCOMOTION in PROTOZOA. (6)  
(b) Describe CONJUGATION in PARAMECIUM and its  
significance (8)  
(c) Give economic importance of SPONGES (6)
2. (a) Write down the economic importance of CORAL REEFS. (5)  
(b) Describe the life history of LIVER FLUKE by giving suitable  
Diagrams. (10)  
(c) Explain METAMERISM and its significance in ANNELIDA. (5)
3. (a) Give the diagnostic features of ARTHROPODS. (6)  
(b) Describe the adaptive modifications of FOOT in GASTROPODS. (7)  
(c) Give an account of WATER VASCULAR SYSTEM IN  
ECHINODERMATES. (7)

SECTION - B

4. (a) Describe the various types of SCALES in FISHES. (5)  
(b) Enumerate the functions of the skin and also tell the structures  
derived from it. (10)  
(c) Write briefly about the POUCHED MAMMALS. (5)
5. (a) Describe the mechanism of RESPIRATION IN MAMMALS. (8)  
(b) Give an account of DENTITION IN MAMMALS. (6)  
(c) Write about the economic importance of birds. (6)
6. (a) Describe the structure and function of MAMMALIAN KIDNEY. (8)  
(b) Write about MIGRATION in birds. (6)  
(c) Snakes are useful creatures. Discuss. (6)

COMPULSORY QUESTION

7. Write only the correct answer in the Answer Book. Do not reproduce the  
question.
  - (A) Which of the four options makes the following statements correct. Just  
write the question number, and one of the serial alphabets on your Answer  
Book. (10)
    - (1) The mode of nutrition in AMOEBA is:
 

(a) Holozoic	(b) Saprozoic
(c) Saprophytic	(d) None of these
    - (2) The Coelom in PLATYHELMINTHYES is:
 

(a) Pseudocoel	(b) Haemocoel
(c) Metacoel	(d) None of these

- (3) EXCRETORY organs in earthworms are:  
 (a) Nephron (b) Flame Cells  
 (c) Malpighian Tubules (d) Nephridia  
 (e) None of these
- (4) Foot is used as an organ of locomotion in which of the following animals:  
 (a) Freshwater mussel (b) Octopus  
 (c) Sepia (d) None of these
- (5) Which group of animals out of the following is DIPLOBLASTIC:  
 (a) Platyhelminthes (b) Echinodermata  
 (c) Coelenterata (d) None of these
- (6) Which of the following animals has the maximum mixing of oxygenated and de-oxygenated blood in the ventricle of its heart:  
 (a) Fish (b) Frog  
 (c) Crocodile (d) None of these
- (7) Reptiles are:  
 (a) Oviparous (b) Viviparous  
 (c) Ovo-viviparous (d) All of these
- (8) The urea formation in mammals takes place in:  
 (a) Kidneys (b) Spleen  
 (c) Liver (d) None of these
- (9) Vertebrates in which placenta is formed during the development of foetus are:  
 (a) Reptiles (b) Aves  
 (c) Mammals (d) None of these
- (10) Lymph most closely resembles with:  
 (a) Plasma (b) interstitial fluid  
 (c) blood (d) None of these
- (B) Check which of the following statements are True(T) or False(F). Simply write question number and T or F on your Answer Book. (10)
- (11) Archaeopteryx is a missing link between birds and reptiles.  
 (12) Skin of frog has well-developed sweat glands.  
 (13) True Coelom develops from endoderm.  
 (14) Archenteron develops during blastula stage.  
 (15) The Trypanosoma causes the disease called "sleeping sickness".  
 (16) Snakes can listen and enjoy music.  
 (17) Echidna is an egg-laying mammal.  
 (18) Herbivores have more pointed teeth than carnivores.  
 (19) Reptiles are warm-blooded animals.  
 (20) The body-cavity in arthropods is a haemocoel.

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FEDERAL PUBLIC SERVICE COMMISSION

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COMPETITIVE EXAMINATION FOR RECRUITMENT TO POSTS  
IN BPS-17, UNDER THE FEDERAL GOVERNMENT, 2002.

ZOOLOGY, PAPER-II

TIME ALLOWED: THREE HOURS

MAXIMUM MARKS: 100

Note: Attempt FIVE questions in all, including Question No. 8 which is COMPULSORY. All questions carry EQUAL marks.

1. (a) Define POLYPLOIDY and explain its role in the origin of new species. (15)  
(b) Explain TEST CROSS and give its significance. (5)
2. (a) Describe the structure and function of PLASMA MEMBRANE. (10)  
(b) Explain the factors that affect the rate of ENZYME ACTION. (5)  
(c) Define INHIBITORS and give its types. (5)
3. (a) Write what you know about the theory of NATURAL SELECTION. How does it differ from MUTATION THEORY? (15)  
(b) Briefly discuss the EMBRYOLOGICAL EVIDENCE of animal evolution. (5)
4. (a) Write about NITROGEN CYCLE in detail. (8)  
(b) Write short notes on the following: (12)  
(i) GREEN HOUSE EFFECT (ii) PARASITISM (iii) PREDATION
5. (a) What is SYNAPSE? How nerve impulse is transmitted from one NEURON to another? (8)  
(b) What is FEED BACK MECHANISM with respect to HORMONES? Explain with examples. (5)  
(c) Write about the transport of oxygen in man and mention the factors which affect the capacity of hemoglobin to combine with oxygen. (7)
6. Write an essay on GENETIC ENGINEERING. (20)
7. Write notes on the following: (20)  
(a) CHROMOSOME MAP (b) RII-factor  
(c) MITOCHONDRIA (d) FOOD WEB

COMPULSORY QUESTION

8. Write only the correct answer in the Answer Book. Do not reproduce the question.
  - (1) Many humans become ill by consuming milk products because they lack:  
(a) bacteria in their intestines (b) remmin  
(c) hydrochloric acid (d) Lactase  
(e) None of these
  - (2) Which of the following processes cause substances to move across membranes without the expenditure of cellular energy:  
(a) endocytosis (b) active transport  
(c) diffusion (d) None of these
  - (3) Respiratory pigment present in muscles is called:  
(a) haemoglobin (b) myoglobin  
(c) haemocyanins (d) globin  
(e) None of these
  - (4) Which one of the following is not a viral disease:  
(a) mumps (b) small-pox  
(c) cowpox (d) Tetanus  
(e) None of these
  - (5) Animals obtain Carbohydrates mainly from:  
(a) sucrose (b) glycogen  
(c) starch (d) glucose  
(e) None of these



- (6) Mesosomes are internal extensions of:  
 (a) Cell Wall (b) Cell membrane  
 (c) Chromatin body (d) None of these
- (7) Sugar in each nucleotide of DNA is:  
 (a) deoxyglucose (b) ribose  
 (c) glucose (d) deoxyribose  
 (e) None of these
- (8) Species is the basic unit of:  
 (a) genetics (b) Zoology  
 (c) ecology (d) universe  
 (e) None of these
- (9) Which one of the following is false about AIDS:  
 (a) HIV (b) HAV  
 (c) T-lymphocytes (d) host specific  
 (e) None of these
- (10) Which statement about plastids is true:  
 (a) They are power house of cell (b) They contain DNA and ribosomes  
 (c) They are found in all organisms (d) They are surrounded by a single membrane  
 (e) None of these
- (11) Which of the following is not found in all bacterial cells:  
 (a) a nucleoid (b) capsule  
 (c) cell membrane (d) ribosomes  
 (e) None of these
- (12) A virion is a:  
 (a) viral protein (b) viral gene  
 (c) virus (d) viral lysozyme  
 (e) None of these
- (13) The study of fossils and their relationship to the evolution of life on earth is called:  
 (a) fossilization (b) Palaeontology  
 (c) Palaeozoology (d) None of these
- (14) A connecting and supporting tissue in animal is:  
 (a) muscle (b) bone  
 (c) nerve (d) Connective  
 (e) None of these
- (15) Interstitial fluid closely resembles to:  
 (a) rain water (b) sea water  
 (c) lake water (d) pond water  
 (e) None of these
- (16) The amount of lactic acid in muscles increases when they are lacking in:  
 (a) CO<sub>2</sub> (b) C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>  
 (c) energy (d) oxygen  
 (e) None of these
- (17) If a person eats more protein than are needed, this causes increased production of:  
 (a) hormones (b) urea  
 (c) lactic acid (d) CO<sub>2</sub>  
 (e) None of these
- (18) The growth of human population is most rapid in:  
 (a) Asia (b) Europe  
 (c) North America (d) None of these
- (19) Which type of tissue forms glands:  
 (a) Connective (b) nervous  
 (c) muscle (d) epithelial  
 (e) None of these
- (20) Carbon combines with nitrogen in amino acid linkages to form:  
 (a) ester bonds (b) peptide bonds  
 (c) ionic bonds (d) None of these

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**FEDERAL PUBLIC SERVICE COMMISSION**

COMPETITIVE EXAMINATION FOR RECRUITMENT TO POSTS  
IN PBS-17, UNDER THE FEDERAL GOVERNMENT, 2003

**ZOOLOGY-I****TIME ALLOWED: THREE HOURS****MAXIMUM MARKS: 100**

**NOTE:** Attempt **FIVE** questions in all, including **Question No. 7** which is **COMPULSORY**. Select **TWO** questions from **each SECTION**. All questions carry **EQUAL** marks. Write clearly.

**SECTION - I**

1. (a) Discuss the phenomenon of Autogamy with special reference to PARAMECIUM. (07)
- (b) Give a brief over view of PARASITIC ADAPTATIONS in PLATYHELMINTHES. (07)
- (c) "SPONGES have a DIPLOBLASTIC organization". Discuss the statement. (06)
2. (a) Define POLYMORPHISM, and explain with reference to COELENTRATA. (08)
- (b) Describe RESPIRATORY SYSTEM in insects. (07)
- (c) "The skeletal support though gives protection, yet make MOLLUSCS inefficient". Comment on the statement. (05)
3. (a) "The ANNELIDS are METAMERICALLY SEGMENTED organisms". Discuss the statement. (10)
- (b) Discuss the WATER VASCULAR system in ECHINODERMS. (10)

**SECTION - II**

4. (a) Discuss RETROGRESSIVE METAMORPHOSIS with reference to Ascidian. (10)
- (b) "AMPHIOXUS is an ideal CHORDATE". Comment. (10)
5. (a) Discuss the evolutionary changes in the structure of heart in different CHORDATE groups. (10)
- (b) Write a brief essay on MIGRATION in birds. (10)
6. (a) Give an account of development of chick upto the development of three GERMINAL LAYERS. (12)
- (b) Name the ten CRANIAL NERVES found in SCOLIODON. (08)

**COMPULSORY QUESTION**

7. (A) Write only the correct answer in the Answer Book. Do not reproduce the question.
  - (1) Contractile vacuole in PROTOZOA is basically concerned with:
 

(a) Excretion	(b) Osmoregulation
(c) Respiration	(d) None of these
  - (2) GAMMULES are produced in:
 

(a) Annelida	(b) Arthropoda
(c) Porifera	(d) None of these
  - (3) Scales in REPTILES Originate from:
 

(a) Ectoderm	(b) Mesoderm
(c) Endoderm	(d) None of these

**ZOOLOGY-I**

- (4) The CHORDATES are dissected from:
  - (a) Dorsal side
  - (b) ventral side
  - (c) Lateral sides
  - (d) Both (a) and (b) above
  - (e) None of these
  
- (5) Open type of blood vascular system is present in:
  - (a) Echinoderms
  - (b) Chordates
  - (c) Molluscs
  - (d) None of these
  
- (6) Frog has the following number of NECK VERTEBRAE:
  - (a) Seven
  - (b) Nine
  - (c) Four
  - (d) Zero
  
- (7) Insects have not adapted to the environment:
  - (a) Aquatic
  - (b) Fresh water
  - (c) Marine
  - (d) All of these
  
- (8) The true jaw is not present in:
  - (a) ELASMOBRANCHS
  - (b) BONEY FISH
  - (c) AGNATHA
  - (d) None of these.
  
- (9) SEA HORSE is included in:
  - (a) PISCES
  - (b) Mammals
  - (c) Insects
  - (d) Mollusca
  - (e) None of these
  
- (10) A house fly has the following number of legs:
  - (a) Four
  - (b) Eight
  - (c) Six
  - (d) None of these

(B) Check the following statements as true(T) and false(F). Simply write the question number and T and F on the Answer Book.

- (11) Some sponges are found in freshwater also.
- (12) CHOANOCYSTS are found in COELENTRATES.
- (13) Coral reefs are present in the sandy coasts of Karachi.
- (14) All the internal body cavities are not COELOME .
- (15) Mouth parts in ARTHROPODES are modified appendages.
- (16) The appearance of different stages in the embryonic development of a mammal is called as METAMORPHOSIS.
- (17) The major part of the CHORDATE Body is MESODERMAL in origin.
- (18) The ECHINODERMS and CHORDATES are ENTEROCOELIC.
- (19) Giraffe and goat are similar in having seven neck vertebrae.
- (20) The mammals are characterized by having Mammary glands.

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**FEDERAL PUBLIC SERVICE COMMISSION****COMPETITIVE EXAMINATION FOR RECRUITMENT TO POSTS  
IN PBS-17, UNDER THE FEDERAL GOVERNMENT, 2003****ZOOLOGY-II****TIME ALLOWED: THREE HOURS** **MAXIMUM MARKS: 100****NOTE:** Attempt **FIVE** questions in all, including **Question No. 8** which is **COMPULSORY**. All questions carry **EQUAL** marks. Write clearly.

1. (a) Draw neat diagrams representing important stages of meiosis in an organism having the diploid chromosomal number of 4. (12)  
(b) Define Excretion and briefly discuss the main excretory products in animals. (8)
2. (a) Define and explain Genetic Linkage. What are the cytological bases of linkage? (8)  
(b) How will you explain the production of long neck in Giraffe under Darwinian Theory. (12)
3. (a) Give a detailed account of PHOSPHORUS cycle. (10)  
(b) What do you understand from energy subsidy. (5)  
(c) Define hormones. How does these differ from enzyme. (5)
4. (a) Discuss the mechanism of transport of oxygen from lungs to the tissues. (10)  
(b) Write a brief note on PARACENTRIC INVERSION. (10)
5. (a) Give a brief account of ORTHOGENESIS. (8)  
(b) Discuss the basic structure and chemical composition of MITROCHONDRION. (12)
6. (a) Define pollution. Discuss air pollution with reference to Pakistan. (8)  
(b) Define and explain EPISTASIS. How does it differ from Genetic dominance? (12)
7. Write short notes on the following:  
(a) GOLGI COMPLEX (b) GLOBAL WARMING  
(c) Possible first living organism (d) Linkage

**COMPULSORY QUESTION**

8. Write only the correct answer in the Answer Book. Do not reproduce the question.
  - (1) The main division of the chromosomes occurs in:  
(a) Prophase (b) Metaphase  
(c) Anaphase (d) Telophase (e) None of these
  - (2) The protein synthesis occurs in:  
(a) Mitochondrion (b) Endoplasmic reticulum  
(c) Ribosomes (d) Acrosome (e) None of these
  - (3) Blood antigens are present in:  
(a) Blood serum (b) RBC's  
(c) WBC's (d) Platelets (e) None of these
  - (4) Sex linked genes are the genes located on:  
(a) x-chromosome only (b) y-chromosome only  
(c) Both x and y chromosomes (d) x or y chromosomes  
(e) None of these

- (5) Transcription is the phenomenon associated with:  
 (a) Synthesis of new DNA (b) Formation of mRNA from DNA  
 (c) Formation of tRNA (d) None of these
- (6) Segregation of alleles of a gene occurs in:  
 (a) Diploid individual (b) Homozygous individual  
 (c) Heterozygous individual (d) All of the above  
 (e) None of these
- (7) Sodium-Potassium pump is located in:  
 (a) Liver (b) Heart cell  
 (c) Nerve cell (d) All of these  
 (e) None of these.
- (8) Pepsin is an enzyme responsible for breaking:  
 (a) Proteins (b) Lipids  
 (c) Fats (d) None of these
- (9) Pace maker is located in:  
 (a) Liver (b) Brain  
 (c) Heart (d) Muscle (e) None of these
- (10) Follicle stimulating hormone are produced in:  
 (a) Pituitary (b) Ovaries  
 (c) Thyroid (d) Kidney (e) None of these
- (11) Genetic dominance is strongly associated with:  
 (a) Personality dominance (b) Adaptive value  
 (c) Population distribution (d) None of these
- (12) Crossing over is the physical exchange between chromosomes:  
 (a) Homologous (b) Non-Homologous  
 (c) Both (a) and (b) above (d) None of these
- (13) XXY individual in man is phenotypically a:  
 (a) Male (b) Female  
 (c) Inter sex (d) None of these
- (14) Amino acids are the organic compound behaving like:  
 (a) Acid (b) Base  
 (c) Both (a) and (b) above (d) None of these
- (15) Which of these can be the first living organism on the earth:  
 (a) Protozoan (b) Algae  
 (c) virus (d) None of these
- (16) Ontogeny represents the history of an organism:  
 (a) Evolutionary (b) Embryonic  
 (c) Both (a) and (b) above (d) None of these
- (17) Nuclear membrane has a structure similar to:  
 (a) Cell membrane (b) Mitochondrion  
 (c) Endoplasmic reticulum (d) All of these
- (18) Osmosis is the movement of solutes through a membrane:  
 (a) Permeable (b) Semi-permeable  
 (c) Both (a) and (b) above (d) None of these
- (19) Sickle Cell Anemia is the condition where the RBC's deflate:  
 (a) Under Oxygen (b) Absence of Oxygen  
 (c) Both (a) and (b) above (d) None of these
- (20) Pond is an example of ecosystem:  
 (a) Complete (b) Incomplete  
 (c) Almost complete (d) None of these

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# FEDERAL PUBLIC SERVICE COMMISSION

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## COMPETITIVE EXAMINATION FOR RECRUITMENT TO POSTS IN BPS-17 UNDER THE FEDERAL GOVERNMENT, 2004.

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### ZOOLOGY, PAPER-I

**TIME ALLOWED: THREE HOURS**

**MAXIMUM MARKS: 100**

**NOTE:** Attempt FIVE questions in all, including QUESTION NO. 7 which is **COMPULSORY**. Select TWO questions from each of the SECTIONS I AND II. All questions carry EQUAL marks. Write clearly.

#### SECTION - I

1. (a) Give a brief account of Pathogenic Protozoa. (7)  
(b) Describe different types of Canal System found in Sponges. (7)  
(c) "In Tapeworm True Segmentation is absent". Comment. (6)
2. (a) "Polyp and Medusa are strictly homologous structures". Justify the statement. (7)  
(b) Tracheal apparatus of insects and those of Arachnids are essentially different. Discuss the above statement. (6)  
(c) Give an account of Podium in Mollusca. (7)
3. Write short notes on the following: (5 each)  
(a) Schizocoel (b) SECONDARY Segmentation  
(c) Echinoderm Larvae (d) Water Vascular System in Echinoderms

#### SECTION - II

4. (a) "Hemichorda" should not be included in Chordata. Justify the statement. (8)  
(b) "Amphioxus" is certainly related to Ancestral vertebrates. Comment upon the statement. (12)
5. (a) Discuss the Evolution of Aortic Arches in different vertebrate groups. (8)  
(b) Discuss Birds as a flying Machine. (12)
6. (a) Briefly describe the structure, formation and function of "Placenta" in Mammals. (12)  
(b) Amplify the statement that Monotremes show a mixture of Mammalian and Reptilian characters. (8)

#### COMPULSORY QUESTION

7. Write only the correct answer in the Answer Book. Do not reproduce the question.
  - (1) Despite the structural diversities they are characterized by having soft body protected by calcareous shell developing from the mantle layer.  
(a) Corals (b) Foraminiferous  
(c) Molluses (d) None of these
  - (2) The members of the phylum are exclusively Marine:  
(a) Porifera (b) Coelenterata  
(c) Echino-dermata (d) None of these
  - (3) How many paired legs are present in Arachnids:  
(a) 2 pairs (b) 3 pairs (c) 4 pairs (d) None of these
  - (4) A true Coelom is absent in:  
(a) Platy helminthes (b) Mollusca  
(c) Insecta (d) None of these
  - (5) A single aperture is present in:  
(a) Nematoda (b) Cnidaria (c) Annelida (d) None of these

- (6) The following represents Enterocoelous phylum:  
 (a) Annelida (b) Mollusca  
 (c) Echinodermata (d) None of these
- (7) It is exclusively a Parasitic group:  
 (a) Ciliata (b) Mastigophora (c) Phizopoda (d) Sporozoa  
 (c) None of these
- (8) Most species of Animal Kingdom belong to this Class:  
 (a) Acazina (b) Hexapoda (c) Crustacea (d) None of these
- (9) Insect mouth parts are serially homologous:  
 (a) Claspers (b) Sting apparatus (c) Cerci  
 (d) legs (e) None of these
- (10) The only groups of animals which are diploblastic in nature:  
 (a) Platy helminthes (b) Coelentrata  
 (c) Porifera (d) None of these
- (11) The phenomenon in which larva becomes sexually mature:  
 (a) Retrogressive Metamorphosis (b) Neoteny  
 (c) Both (a) and (b) (d) None of these
- (12) Amphibians have the following number of chambers in their heart:  
 (a) Two (b) Three (c) Four (d) Five  
 (e) None of these
- (13) The Young are born in less developed condition:  
 (a) Monotremes (b) Marsupials  
 (c) Placentals (d) None of these
- (14) Limbs of Sea Cows and Sea loins are the product of:  
 (a) Convergent Evolution (b) Divergent Evolution  
 (c) Parallel Evolution (d) None of these
- (15) In these animals the teeth are reduced to molars without enamel or no teeth are present:  
 (a) Moles (b) Bats (c) Sloths (d) None of these
- (16) Only hind limbs are lost in:  
 (a) Snakes (b) Whales (c) Bats (d) None of these
- (17) Among the following which snake is non-poisonous:  
 (a) Krait (b) Python (c) Viper (d) None of these
- (18) Which one is excluded from the Phylum Chordata:  
 (a) Urochordata (b) Hemichordata  
 (c) Cephalochordata (d) None of these
- (19) The earliest known species of birds is:  
 (a) Archaeopteryx (b) Hesperornis  
 (c) Ichthyornis (d) None of these
- (20) A muscular diaphragm helps to move air into and out of the lungs in:  
 (a) Amphibians (b) Reptilians  
 (c) Avians (d) Mammalians  
 (e) None of these

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COMPETITIVE EXAMINATION FOR RECRUITMENT TO POSTS IN BPS-17  
UNDER THE FEDERAL GOVERNMENT, 2004.

ZOOLOGY, PAPER-II

TIME ALLOWED: THREE HOURS

MAXIMUM MARKS: 100

NOTE:

Attempt FIVE questions in all, including QUESTION NO. 8 which is COMPULSORY. All questions carry EQUAL marks. Write clearly.

1. (a) Give a diagrammatic representation of the structure of the mitochondrion and its molecular skeleton to show its association with ELECTRON TRANSPORT and OXIDATIVE PHOSPHORYLATION. (12)
- (b) Define "Respiration", and "EXTERNAL" and "INTERNAL" RESPIRATION. HOW THE AIR CONDUCTING PASSAGE WAYS and the Respiratory MEMBRANES function to achieve these goals. (8)
2. (a) How 'GENETIC MAPS' OF CHROMOSOMES are constructed in *Drosophila*. What techniques should be used in man for this purpose? (12)
- (b) Could "NATURAL SELECTION" alone produce "SPECIATION" in natural populations. (8)
3. (a) Differentiate between physical and chemical regulation of body temperature (8)
- (b) Explain the meaning of "Conduction", "Convection" and radiation in relation to the loss of heat from the body. (12)
4. (a) Is there any truth in "NEO LAMARCKISM"? HOW 'BALDWIN EFFECT' fits in this concept? (12)
- (b) Briefly describe Polyploidy as a method of origin of species. (8)
5. (a) Differentiate between Immunity against a disease and Resistance against a pesticide in natural populations. (12)
- (b) Define "INDUSTRIAL MELANISM. Explain why in a polluted area near Birmingham, U.K., most of the specimens of peppered moth are melanic but in countryside these are typical light coloured. (8)
6. (a) Define "PESTICIDAL POLLUTION". In how many ways does it effect the human health? (8)
- (b) Show as to how complementary interactions of two independent pairs of ALLELES in seed colour in corn or coat colour in RODENTS modify the "MENDELIAN RATIO" of independent assortment. Do these modified ratios in fact disprove "Mendelian Second Law of Independent Assortment? (12)
7. Write short notes on the following: (5 each)
  - (a) Genetic drift
  - (b) Aggressive Mimicry
  - (c) Acid rain
  - (d) Chemogeny

COMPULSORY QUESTION

8. Write only the correct answer in the Answer Book. Do not reproduce the question.
  - (1) "Chiasma" formation could be seen first time in the following stage/sub stage of Meiosis:
    - (a) Leptotene
    - (b) Zyototene
    - (c) Pachytene
    - (d) Diplotene
    - (d) None of these
  - (2) In protein synthesis each triplet code binds itself with one:
    - (a) Phosphate molecule
    - (b) enzyme
    - (c) amino acid molecule
    - (d) lipid molecule
    - (d) None of these



- (3) For the rapid production of antibody in the precipitance test involving a rabbit one of the following animals could be used:  
 (a) Frog (b) Lizard (c) Fowl (d) None of these
- (4) In *Drosophila* very rarely father transmit his sex-linked trait to his normal son (in a cross of white-eyed female with red-eyed male):  
 (a) in the case of primary non-disjunction.  
 (b) in the case of secondary non-disjunction  
 (c) in the case of a normal cross  
 (d) None of these
- (5) 13 : 3 Ratio in "F<sub>2</sub>" is obtained in the case of:  
 (a) Complementary genes for colours in corn (b) Coat colours in rodents  
 (c) In epistatic genes (d) None of these
- (6) Crossing over rarely or never takes place in the male of:  
 (a) mice (b) poultry (c) man  
 (d) *Drosophila* (e) None of these
- (7) XXY individual in *Drosophila* is phenotypically:  
 (a) Male (b) Female (c) Inter sex (d) None of these
- (8) Fossils of which of these first living organisms were found:  
 (a) Protozoan (b) Algae (c) Virus (d) None of these
- (9) Which of these are exclusively functional proteins:  
 (a) Hormones (b) Enzyme (c) Plasma (d) None of these
- (10) Phylogeny represents the history of an organism:  
 (a) Evolutionary (b) Embryonic  
 (c) Both (a) and (b) above (d) None of these
- (11) Sickle Cell trait is found in:  
 (a) Homozygous (b) Heterozygous  
 (c) Both (a) and (b) above (d) None of these
- (12) The first living and respiring organism on earth were:  
 (a) aerobes (b) anaerobes  
 (c) Both (a) and (b) above (d) None of these
- (13) The major portion of digestion takes place in the:  
 (a) Stomach (b) In the small intestine  
 (c) In the large intestine (d) None of these
- (14) Practically all absorption of digested food occurs in:  
 (a) large intestine (b) small intestine  
 (c) Both (a) and (b) above (d) None of these
- (15) Sibling species are produced as a result of:  
 (a) Allopatric speciation (b) Sympatric speciation  
 (c) Both (a) and (b) above (d) None of these
- (16) In the days just after its formation the earth had:  
 (a) Reducing atmosphere (b) Oxidative atmosphere  
 (c) Both (a) and (b) above (d) None of these
- (17) Zygotes containing "XY" are females in:  
 (a) *Drosophila* (b) in moths  
 (c) in grasshoppers (d) None of these
- (18) The "Y" Chromosome is sexually neutral in:  
 (a) man (b) in *Drosophila*  
 (c) in moth (d) None of these
- (19) Marsupials are found in:  
 (a) Only Australian region (b) in Near arctic and Neotropical regions  
 (c) in both (a) and (b) above (d) None of these
- (20) In which stage of Meiosis Centromeres of each dyad divides:  
 (a) Metaphase I (b) Metaphase II  
 (c) Anaphase I (d) Anaphase II  
 (e) None of these

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**FEDERAL PUBLIC SERVICE COMMISSION**  
**COMPETITIVE EXAMINATION FOR RECRUITMENT TO POSTS**  
**IN BPS-17, UNDER THE FEDERAL GOVERNMENT, 2005**

**ZOOLOGY, PAPER-I**

TIME ALLOWED: THREE HOURS MAXIMUM MARKS: 100

NOTE: Attempt FIVE questions in all, including QUESTION NO.7, which is COMPULSORY. Select any two questions each from SECTION-I and SECTION-II. Give neat diagrams wherever required.

**SECTION - I**

1. (a) Write a brief account of conjugation in Protozoa. (7)  
(b) "Porifera is a group falling at just above the colonial level of organization". Comments. (7)  
(c) "Corals are distributed over a wider range, yet coral reefs are present in selected areas." Discuss. (6)
2. (a) "Parasitism leads to development of some characters and withdrawal of some other characters." Discuss the statement with reference to platyhelminthes. (7)  
(b) Write a brief account of shell in Mollusca. (6)  
(c) "Water Vascular system is the life line in Echinodermata." Comment the statement. (7)
3. Write short notes on the following:- (5 each)  
(a) Metameric segmentation (b) Respiration in Arthropoda  
(c) Pseudocoelome (d) Enterocoelomates

**SECTION - II**

4. (a) Discuss retrogressive metamorphosis with reference to Ascidians. (8)  
(b) "Amphioxus is an ideal chordate." Discuss the statement. (12)
5. (a) "Skeleton in petromyzon is at very initial stage of development." Justify the statement. (10)  
(b) "Heart gradually evolved into a more efficient pumping organ in different chordate groups." Explain the statement. (10)
6. (a) Write an essay on migration in birds, with special reference to Pakistan. (9)  
(b) Discuss the different types of eggs found in different chordate groups. (11)

**COMPULSORY QUESTION**

7. Write only the correct answer in the Answer Book. Do not reproduce the question.
  - (1) Coelome is the body cavity originating from:  
(a) Ectoderm (b) Mesoderm  
(c) Endoderm (e) None of these
  - (2) Cytopyranx is a structure present in:  
(a) Amoeba (b) Paramecium  
(c) Euglena (d) Foraminifers (e) None of these
  - (3) Gametes are the reproductive structure, produced in:  
(a) Sponges (b) Annelids  
(c) Arthropods (d) Coelenterates
  - (4) Comb plates are very specific structures of:  
(a) Coelenterate (b) Arthropoda  
(c) Ctenophore (d) None of these
  - (5) Nerve net is present in coelenterates at:  
(a) In Endodermis (b) Below the upper epidermis  
(c) In Mesoglea (d) Not present in coelenterate

- (6) Circulatory system in insects is:  
(a) closed type (b) open type  
(c) lymphic type (d) All of these
- (7) Silk is produced by Silkworm :  
(a) Larwa (b) Adult  
(c) Pupa (d) All of these
- (8) The basic function of a flame cell is:  
(a) Excretion (b) Osmoregulation  
(c) Digestion (d) None of these
- (9) The scales in fishes are:  
(a) Ectodermal (b) Endodermal  
(c) Mesodermal (d) Different in different fishes
- (10) The neck of a camel has vertebrae:  
(a) 14 (b) 9  
(c) 7 (d) 20 (e) None of these
- (11) Spiders are Arachnids and they have legs:  
(a) 6 (b) 8  
(c) 9 (d) None of these
- (12) Gill slits in chordates are present in:  
(a) Mouth (b) Pharynx  
(c) Oesophagus (d) All of these
- (13) Birds are flying and have ovaries:  
(a) one on right side (b) Both on right and left side  
(c) one on any side (d) one on left side
- (14) Adult Echinoderm has symmetry:  
(a) Bilateral (b) Radial  
(c) Both (a) and (b) (d) None of these
- (15) The typical characters of all mammals is:  
(a) Mammary gland (b) Brain  
(c) Hair (d) All of these
- (16) Mouth in sharks is located:  
(a) Dorsal (b) Ventral  
(c) Anterior end (d) None of these
- (17) The number of ribs in frog are:  
(a) 4 (b) 6  
(c) 8 (d) None of these
- (18) Earthworm are dissected from side:  
(a) Dorsal (b) Ventral  
(c) Both (a) and (b) (d) lateral
- (19) Duck billed platypus is a:  
(a) Bird (b) Placental Mammal  
(c) Monotreme (d) Marsupial
- (20) Silver fish is a member of:  
(a) Pisces (b) Insects  
(c) Echinodermata (d) None of these

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**FEDERAL PUBLIC SERVICE COMMISSION**  
**COMPETITIVE EXAMINATION FOR RECRUITMENT TO POSTS**  
**IN BPS-17, UNDER THE FEDERAL GOVERNMENT, 2005**

**BOTANY, PAPER-II**

TIME ALLOWED: THREE HOURS MAXIMUM MARKS: 100

**NOTE:** Attempt **FIVE** questions in all, including **QUESTION NO.8**, which is **COMPULSORY**. All questions carry **EQUAL** marks.

1. (a) Discuss the role of light and the transformation of CO<sub>2</sub> in Photosynthesis. (8)  
(b) Define respiration. What is meant by respiratory quotient. (4)  
(c) What is dormancy? Describe methods of breaking dormancy. (8)
2. (a) Define ecology. Describe applications of ecology in detail. (10)  
(b) What is plant succession? Give detailed account of process of plant succession starting in a lake. (10)
3. (a) Give an account of methods for reclamation of Waterlogged soil. (10)  
(b) Write an essay on natural resources of Pakistan. (10)
4. (a) What is soil erosion? What are its causes? How we can control it? (10)  
(b) Environmental Pollution is the result of Urbanization and Industrializations. Comment. (10)
5. Write notes on the following:- (20)  
(a) Plant Hormones (b) Vernalization and its significance  
(c) Food Web (d) Methods of Sampling vegetations
6. Describe the structure and functions of following cell organelles. (20)  
Draw diagram where necessary:-  
(a) Mitochondria (b) Cell Wall (c) Golgibodies  
(d) Endoplasmic reticulum (e) Ribosomes
7. (a) What do you know about theory of natural selection. (5)  
(b) What is mutation? Describe its different types? (5)  
(c) Give an account of crossing over and Polyploidy. (10)

**COMPULSORY QUESTION**

8. Write only the correct answer in the Answer Book. Do not reproduce the question. (20)
  - (1) The membrane of vacuole is known as:  
(a) Tonoplast (b) Chromoplast  
(c) Leucoplast (d) None of these
  - (2) The RNA which helps in decoding of triplet codon is known as:  
(a) r RNA (b) t RNA  
(c) m RNA (d) None of these
  - (3) Transfer of material from higher concentration to lower concentration across semipermeable membrane is called:  
(a) mass flow (b) Diffusion  
(c) Osmosis (d) None of these
  - (4) Loss of water in the form of vapours from living surface of plants is termed as:  
(a) Evaporation (b) Sublimation  
(c) Evapotranspiration (d) None of these
  - (5) The movement of material within the plant body is known as:  
(a) absorption (b) ascent of sap  
(c) Translocation (d) None of these

- (6) The oxygen produced during photosynthesis comes from:  
(a) air (b) water  
(c) CO<sub>2</sub> (d) ATP
- (7) The study of plant community is called:  
(a) Ecology (b) Autecology  
(c) Plant Geography (d) None of these
- (8) The bending movement of plant in response to light is known as:  
(a) Thigmotropism (b) transotropism  
(c) Phototropism (d) Chemotropism
- (9) The occurrence of vegetation in layers is known as:  
(a) Pattern (b) Stratification  
(c) Scarification (d) Physiognomy
- (10) The plants which prefer to grow in moderate habitats are called as:  
(a) Xerophytes (b) Hydrophytes  
(c) Heliophytes (d) None of these
- (11) A particular place where the organism lives is termed as:  
(a) environment (b) Nich  
(c) Habitat (d) None of these
- (12) Pioneerspecies of xerosere are:  
(a) Crustose lichens (b) Foliose lichens  
(c) Fungi (d) Grasses
- (13) The strip of vegetation planted to check the velocity of wind is called as:  
(a) Timberline (b) flag formation  
(c) Shelter belt (d) None of these
- (14) The factors which are concerned with soil are called as:  
(a) climatic factor (b) Edaphic factors  
(c) Topographic factors (d) Physiographic factors
- (15) The chromosomes are composed of:  
(a) Protein (b) DNA  
(c) Protein and-DNA (d) None of these
- (16) Test cross is a cross between:  
(a) F<sub>1</sub> and F<sub>1</sub> (b) F<sub>1</sub> and F<sub>2</sub>  
(c) F<sub>1</sub> and double recessive (d) None of these
- (17) The colorless plastids are known as:  
(a) Leucoplast (b) Chloroplast  
(c) Chromoplast (d) None of these
- (18) Genes are located on:  
(a) Nucleus (b) DNA  
(c) Ribosomes (d) Chromosomes
- (19) Division of Nucleus is termed as:  
(a) cytokinesis (b) Karyokinesis  
(c) Karyoty<sub>o</sub> (d) None of these
- (20) The cell organelle on which ribosomes are present are called:  
(a) Rough ER (b) Smooth E.R.  
(c) Cytoplasm (d) None of these

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