

**PUNJAB PUBLIC SERVICE COMMISSION**  
**COMBINED COMPETITIVE EXAMINATION FOR**  
**RECRUITMENT TO THE POSTS OF**  
**PROVINCIAL MANAGEMENT SERVICE -2019**

**SUBJECT: ZOOLOGY (PAPER-I)**

**TIME ALLOWED: THREE HOURS**

**MAXIMUM MARKS: 100**

**NOTE:** **Attempt FIVE Questions at least TWO Questions from each Section.**  
**Attempt in Urdu or English.**

**SECTION-I**

- Q. No. 1:** a) Discuss diverse types of parasite of economic importance in protozoans.  
b) Elaborate types of canal system in porifers with example of each.  
**(10+10=20 Marks)**
- Q. No. 2:** a) Explain the reasons for the success of arthropods.  
b) Discuss diversity in gastropods along with torsion and foot modifications.  
**(10+10=20 Marks)**
- Q. No. 3:** a) Describe the life cycle Liver Fluke (*Fasciola hepatica*)  
b) Write a note on the larval forms and evolutionary significance of echinoderms  
**(10+10=20 Marks)**
- Q. No. 4:** **Write short note on any Four of the following:** **(4x5=20 Marks)**  
a. Spicules      b. Ascaris-life cycle      c. Pseudo-coelomate body plan  
d. Metamerism      e. Annelid-phylogenetic relationship

**SECTION-II**

- Q. No. 5:** a) Define amplexus. Discuss reproduction in Frog.  
b) Explain Anatomical modifications in birds.  
**(10+10=20 Marks)**
- Q. No. 6:** a) Discuss poisonous apparatus and biting mechanism in poisonous snake.  
b) Write a note regarding different modifications in mammals to live in different environments.  
**(10 + 10=20 Marks)**
- Q. No. 7:** a) Explain the thermoregulatory adaptations and strategies of mammals.  
b) Give a comparative account of the evolution of heart in vertebrates.  
**(10 + 10=20 Marks)**
- Q. No. 8:** **Write short note on any Four of the following:** **(4x5=20 Marks)**  
a. Dentition      b. Stomach in vertebrates      c. Migratory birds  
d. Swim bladder      e. Dinosaurs-causes of evolution and extinction