

ORGAN SYSTEMS (Ch. 6-12)

1. INTEGUMENTARY SYSTEMS

functions - protect from external environment

- prevent water loss or gain
- also sensory and respiratory

protozoa - cell membrane

verts - epidermal & dermal layers

- dermal scales (fishes)
- epidermal scales (reptiles)
- mucus (amphibians)
- feathers (birds)
- hair (mammals)

2. SKELETAL SYSTEMS

functions - support vs gravity or water pressure

- protect & attach internal organs

protozoa - microtubules

inverts - hydrostatic (H₂O pressure)

- exoskeleton (shell)
- endoskeleton (internal crystals)

verts - endoskeleton (cartilage vs true bone)

- axial - skull, vertebrae, rib cage
- appendicular - fore & hind limbs
- pectoral & pelvic girdles

3. MOTILITY / MUSCULAR SYSTEMS

functions - movement & locomotion

protozoa - pseudopods, cilia, flagella

verts - muscle (skeletal, smooth, cardiac)

4A. NERVOUS SYSTEMS

functions - immediate regulation

- electrochemical impulse
- integrate senses, effect muscles & glands

neurons - dendrites, cell body, axon, synapse

inverts - ganglion vs brain

verts - brain stem (basic functions)

- cerebellum (subconscious movement)
- cerebrum (emotion & intellect)

4B. SENSE ORGANS

function - convert info into nerve impulses

olfaction - taste vs smell

vision - photoreception vs image-forming

- simple vs compound eye

audition - hearing & sonar (echolocation)

mechanoreception - pressure & touch

temperature - hot vs cold, infrared

equilibrium - gravity

proprioception - body position in joints

5. ENDOCRINE SYSTEMS

function - long-term regulation, chemical hormones

glands - no ducts, pituitary & gonads

6. CIRCULATORY / CARDIOVASCULAR SYSTEMS

functions - transport & homeostasis

inverts - diffusion (esp. small & flat)

- open system (incomplete vessels)

verts - closed system (artery, capillary, vein)

- blood (hemoglobin bind O₂ & CO₂)
- 4-chambered heart (birds & mammals)

7. LYMPHATIC / IMMUNE SYSTEMS

functions - lymphocytes protect against disease
- antibodies neutralize toxins

lymph nodes & vessels

8. RESPIRATORY SYSTEMS

functions - inspire O₂ & expire CO₂
- also vocalization (birds & mammals)

inverts - diffusion (esp small or flat)
- anaerobic (O₂ debt, mud & parasitic)

verts - gills vs lungs

9. DIGESTIVE SYSTEMS

functions - break down & absorb food for energy
- eliminate undigested waste
- mechanical vs chemical digestion

nutrients - carbohydrates & lipids (energy)
- proteins (structure & enzymes)
- vitamins & minerals

autotrophs - photosynthesis (protozoa)
- also symbiotic green algae

heterotrophs

- herbivore
- carnivore
- omnivore
- decomposer

10. EXCRETORY / URINARY SYSTEMS

function - excrete metabolic waste & H₂O

protozoa - vacuoles

verts - kidneys & sweat glands
- ammonia, urea, or uric acid

11. TEMPERATURE REGULATION

functions - resist external fluctuations (0-40°C)
- govern metabolic reactions (cold vs hot)

ectotherms - conform to environment, behavior

endotherms - mammals 37°C, birds 41°C
- flight, escape predators, nocturnal
- insulation (feathers & hair)
- inactivity (hibernation & torpor)