

# MOHANLAL SUKHADIA UNIVERSITY, UDAIPUR

## B. Sc. BIOTECHNOLOGY II YEAR TDC (2016-17)

### Paper VI : *Plant and Animal Physiology*

#### Unit-I

Plant–water relations : Importance of water to plant life, physical properties of water, diffusion and osmosis, absorption, transport of water and transpiration, physiology of stomata. Mineral nutrition : essential macro and micro-elements and their role, mineral uptake, deficiency and toxicity symptoms.

**15 Credit hours**

#### Unit-II

Growth and development in plants. Definitions, phases of growth and development, kinetics of growth, seed dormancy, seed germination and factors of their regulation, plant movements, the concept of photoperiodism, physiology of flowering, florigen concept, biological clocks, physiology of senescence, fruit ripening, plant growth regulators– auxins, gibberellins, cytokinins, abscissic acid and ethylene, history of their discovery, biosynthesis and mechanism of action.

**15 Credit hours**

#### Unit-III

Photomorphogenesis, phytochrome and cryptochromes-discovery, physiological role and mechanism of action. Stress physiology – stress, plant responses to stress, water stress, temperature stress, salt and metal stress. Heat shock proteins. Reactive oxygen molecules.

General and cellular basis of animal physiology. Digestion and absorption of food-in stomach and small intestine; circulation of body fluid, blood vessels, blood flow and blood cells, ABO blood groups and Rh factor, mechanism of blood clotting.

**15 Credit hours**

#### Unit-IV

Respiration – mechanism of respiration; vital capacity of lungs; transport of gases; dissociation curve of oxyhaemoglobin and control of respiration. Excretion – Formation of ammonia, urea and uric acid; structure and functions of nephron; control of renal functions – role of kidney in the regulation of water and salt. Muscle and movement – ultrastructure and physiology of muscle contraction. Nerve physiology – ultrastructure of a neuron, synapse, propagation of nerve impulse.

**15 Credit hours**

#### Unit-V

Structure and functions of endocrine glands (pituitary, adrenal, thyroid and parathyroid). Neuro-endocrine regulation, secondary messenger concept.

Reproductive physiology – reproductive mechanisms, functional morphology of reproductive organs, gametogenesis, reproductive cycle, hormonal control.

**15 Credit hours**

### **Suggested Readings**

1. Guyton, A.C. and Hall, J.E. A Text Book of Medical Physiology (10<sup>th</sup> Edition). W.B. Saunders company.
2. Ganong, H. Review of Medical physiology. McGraw Hill.
3. Fluer, S. Physiology (a regular system approach). McMillan Pub. Co.
4. Shier, Jakie, Butler and Lewis. Human Anatomy and Physiology. WCB, USA.
5. Berry, A.K. Animal physiology.
6. Hopkins, W.G. Introduction to plant physiology. John Wiley and Sons.
7. Salisbury, F.B. and Ross, C.W. Plant physiology. Wadsworth Publishing Co. California, USA.
8. Mohr, H. and Schopfer, P. Plant physiology. Springer Verlag, Berlin, Germany.
9. Taiz, L. and Zeiger, E. Plant Physiology (2<sup>nd</sup> Edition) . Sinauer Associates, Inc., Publishers, Massachusetts, USA.