ZOOLOGY

Unit 1: Human Physiology

Nutrition - introduction - carbohydrates - proteins - lipids - vitamins mineral - water - balanced diet - calorie value - (ICBM standard) - obesity - hyperglycemia - hypoglycemia - malnutrition. Digestion - enzymes and enzyme action - brief account of following - dental caries - root canal therapy - peptic ulcer-Hernia-Appendicitis - Gallbladder stone - Liver cirrhosis - Hepatitis.

Bones and joints (major types) fractures - Dislocations - Arthritis - Rickets and Osteomalasia - orthopaedies - Gout.

Muscles - muscle action - muscle tone - Rigor mortis - muscle pull (hernia) isometric and aerobic exercises (body building) myasthenia gravis.

Respiration - Process of pulmonary respiration - Inspiration Expiration - Exchange of gases at alveolar level - control of respiration - pneumonia - pleurisy - tuberculosis - bronchitis - breathing exercise.

Circulation - functioning of heart origin and conduction of heart beat - artificial pacemaker - coronary blood vessels and its significance - myocardial infraction - angina pectoria - angiogram - angioplasty and coronary bypass surgery - atherosclerosis - heart attack - heart block - ECG and echo cardiography-heart valves-rheumatic heart disease (RHD) ICCU-arterial and venous systems-blood pressure pulse rate-heart transplantation - resuscitation in heart attack (First aid) blood components - functions - plasma-corpuscles - blood clottinganti coagulants-thrombosis-embolism-blood related diseases like polycythemia - leukemia - lymph fluid.

Physiological Co-ordination System: Brain-functioning of different regions - memory-sleep-stroke-Alzheimer's disease - meningitis - Brain fever - conditioned reflex electro encephalography- right brain left brain concept - spinal cord - functioning - reflex action - CSF - chemical coordination -pituitary (Hormones of adeno hypophysis and their regulation) thyroid - parathyroid hormones -insulin and glucogon - hormones of adrenal cortex and medulla - Reproductive hormones - problems related to secretion, non secretion of hormones.

Receptor Organs: Eye - focussing mechanism and photo chemistry of retina - short sightedness - longsightedness - optometry - retinopathy- cataract - Lens replacement - nectalopia - eye infection-conjunctivities - glaucoma - eye care - ear-hearing mechanism - organ of corti - hearing impairments and aids - noise pollution and its importance - skin - melanin functions - Effect of solar radiation / UV skin grafting - dermatitis - tongue - gustatory reception.

Excretion: Ureotelism - urea-biosynthesis (ornithine cycle) nephron ultrafiltration - tubular reabsorption and tubular secretion - renal failure - dialysis kidney stone formation kidney transplantation - diabetes.

Reproductive System: Brief account of spermatogenesis and oogenesis - menstrual cycle - in vitro fertilization - birth control

Unit 2: Microbiology

Introduction - history of medical microbiology - The influence of Pasteur, Koch and Lister - virology - structure genetics culture and diseases - AIDS and its control-bacteriology structure, genetics and diseases - protozoan microbiology - Diseases oriented - pathogenecity of micro organism-anti microbial resistance chemotherapy. Single cell protein. Microbial culture technique and its applications - strain Isolation and Improvement - Isolation of microbial products.

Unit 3: Immunology

Innate immunity (Non specific) - anatomical barriers - physiological barriers - phagocytic barriers lymphoidal organs - thymus - bursa of fabricius - peripheral lymphoid organs - lymph nodes - spleen - antibodiesimmuno globulins - regions of polypeptide chain - Transplantation immunology - classification of grafts - genetic basis of organ transplantimmune system disorder.

Unit 4: Modern Genetics and Animal Biotechnology

Introduction - scope - human genetics karyotyping chromosome gene mapping - recombinant DNA technology and segmenting - genetic diseases - human genome project - cloning - transgenic organisms - Genetically Modified Organism(GMO) - gene therapy - animal cell culture and its applications - stem cell technology - bioethics of genetic engineering in animals. Bio informatics application DNA sequencing and protein structure - biological database.

Unit 5: Environmental Science

Human population and explosion-issue - global warming crisis - green house effect - ozone layer depletion - waste management - biodiversity conservation (biosphere reserve) government and non-governmental organization involved - energy crisis and environmental impact - poverty and environment - freshwater crisis and management.

Unit 6: Applied Biology

Livestock and management dairy - breed of cattle - miltch breed - drought breed dual purpose -common diseases and control - exotic and cross breeds - techniques adapted in cattle breeding. Poultry - farming techniques - breeds-farming method - poultry diseases - economic value Pisciculture - fish farming - edible fishes of Tamil Nadu. Medical lab techniques - stethescope-sphygmomonometer Haemocytometer - urine sugar analysis - ECG - PQRST Wave CT Scan - Endoscopic (laproscopic) techniques artificial pace maker - auto analyzer.

Unit 7: Theories of Evolution

Lamarckism – Darwinism - Neodarwimsm/Modern concept of natural selection - species of concept - origin of species and isolating

Model Questions - B.Tech and Health Sciences UG programs

Part1: Physics

1. The mean time period of a simple pendulum is 1.92 s. Mean absolute error in the time period is 0.05 s. To express the maximum estimate of error, the time period should be written as:
   (a) T = (1.92 ±0.01)s (b) T = (1.92 ±0.25)s
   (c) T = (1.92 ±0.05)s (d) T = (1.92 ±0.10)s

2. An aeroplane travelling at a speed of 500 kmph tilts at an angle of 30o as it makes a turn. What is th radius of the curve?
   (a) 341 km (b) 3.41 km
   (c) 0.341 km (d) 34.1 km

3. A bullet of mass 10gm moving with a speed of 500 m/s gets embedded in a tree after penetrating 5cm into it. Calculate the average retarding force exerted by the wood on the bullet and the work done by the wood in bringing the bullet to stop.
   (a) 25 N, 12.50 joule (b) 250 N, 1250 joule
   (c) 25 KN, 1.250 joule (d) 25 KN, 1250 joule

4. In which one of the following cases will the liquid flow in a pipe be most stream lined?
   (a) Liquid of high viscosity and high density flowing through a pipe of small radius.
   (b) Liquid of high viscosity and low density flowing through a pipe of small radius.
   (c) Liquid of low viscosity and low density flowing through a pipe of large radius
   (d) Liquid of low viscosity and high density flowing through a pipe of large radius

5. For the same pressure and density, the speed of sound is highest in a
   (a) Monoatomic gas (b) Diatomic gas
   (c) Triatomic gas (d) Polyatomic gas

Part 2 – Chemistry

6. Azidothymidine drug is used for treating _____ patients
   (a) Diabetes (b) AIDS
   (c) Jaundice (d) Tuberculosis

7. What is the value of gas constant R in $Jmol^{-1}\ K^{-1}$
   (a) 82.1 (b) $8.314x10^{2}$
   (c) 8.314 (d) 0.0821

8. Which is an example of effusion?
   (a) air slowly escaping from a pinhole in a tire
   (b) the aroma of a cooling pie spreading across a room
   (c) helium dispersing in to a room after a ballon pops
   (d) oxygen and gasoline fumes mixing in an automobile carburetor

9. The most electronegative and electropositive elements of the first period is/are
   (a) H and He (b) Na and Cl
   (c) Li and F (d) H and H

10. Mean distance between atoms is in the range of
    (a) 25 nm (b) 2.5 nm
    (c) 0.25 nm (d) 0.025 nm