



SAI PAT/ICAR CLASSES

DHAMTARI / RAIPUR

कृषि के लिए उपयोगी विज्ञान एवं गणित तत्व

(Elements of Science Mathematics Useful for Agriculture) Ag 1 (80 Marks)

I. AGRIL PHYSICS:- (20 Marks)

1. Principle of Archimedes, Floating bodies density and relative density, determination of R.D. by Hydrometers.
2. Atmospheric pressure. Fortins barometer and its relation to weather conditionmanometer.
3. Pumps-Force and Vacuum pumps, syphon suction pumps.
4. Friction-Laws of Friction, angle of friction, coefficient of friction and its determination, advantages and disadvantages of friction.
5. Machines- simple machines such as plas, lever, pully, Simple wheel, their construction, and working mechanical advantages, Velocity ratio efficiency o
6. Gravitation and gravity: Relation between 'G' and 'g' simple, Harmonic motion Simple pendulum, law of gravitation.
7. Unit of heat, Specific heat, thermal capacity, water .equivalent of heat, determination of Specific heat of solid and liquid, latent heat, determination of latent heat of ice and steam.
8. Transmission of Heat-Conduction, Convection and Radiation, Conductivity, good and bad conductor, Newtons law of cooling-simple idea.
9. Light, Rectilinear, propagation of light, Shadow and eclipse, pinhole camera, reflection through Prism, Dispersion of light, dispersive power spectrum, their type, spectrometer.
10. Optical instruments. Human eye, its defects, photographic camera, simple andcompound microscope, Telescope.
11. Magnetism, Magnetic field, intensity of magnetic field, lines of forces: neutral point, couple acting on magnet placed in a uniform magnetic field. Magnetic movement of magnet. Tangent law and its limitation.
12. Electric charge - Electric potential, electric field and its intensity due to a point, potential inside a conductor.
13. Electrical capacity, its unit, its value for a Spherical conductor, principle of condensers capacity of spherical and parallel plate condenser.
14. Ohms law. Resistance, grouping of resistance, Electromotive 'force and potential difference, potentiometer its principle, comparison of EMF of two cells by potentiometer.
15. Elementary idea of heating effect of Current, Joule's law, Determination of 'j' by Joule's Calorimeter, elementary idea of the house wiring electric iron, Electric power and energy.

II AGRIL. CHEMISTRY :- (20 Marks)

1. Atomic Structure : Bohr's atomic model Distribution of Electrons according to Bohr - Bory Rules, Radio activity and atomic disintegration.
2. Chemical Bonds: Characteristic of electrolyent, Covalent and co-ordinate Bonds.
3. Ionic Theory : Uses of ionization, Solubility product, Hydrolysis, neutralization, Ionic product of water, Determination of pH. Buffer Solution. Nutritional Importance of Soil pH.
4. Colloids: Lyophilic and Lyophobic, properties of colloids, colloids, colloidal solutions, protective colloids, Gold number, soil colloids clay and humus.
5. Introduction of important minerals present in soil and their chemical composition.
6. Chemical Fertilizers Manufacture of different Fertilizers of N.P.K. and their utilization. Micronutrients.
7. Volumetric analysis Strength of solution, normality, Molarity, determination of equivalent weight of acid, base and salt.
8. Introduction to Organic Chemistry, Determination of empirical, molecular and structural formula of simple organic compounds.
9. Classification and nomenclature of organic compounds, Isomerism.
10. Saturated and unsaturated Hydrocarbons, Methane, Ethylene, Acetylene, Chemistry of Gobar Gas.
11. Fermentation, Ethyl alcohol. Aliphatic carboxylic acid-Acetic acid, urea.
12. Oil and fats, Extraction, Composition and properties. Manufacture of soap, Vanaspati ghee, use of oil in paints.
13. Elementary Biochemistry, Carbohydrates. Proteins, Lipids, Vitamins and Enzymes.

III AGRIL MATHEMATICS :- (20 Marks)

1. Arithmetic progression : Definition, formula to find the nth term. Formula to find, sum off n terms. Definition of arithmetic mean. Insertion of given number of means between two given quantities. Finding of remaining quantity when any three of S, a, d, n are given.
2. Geometric Progression : Definition, Formula to find the nth term, geometric mean insertion of geometric means between two given Quantities-Finding of remaining quantity when any three of k, s, a, n, are given.
3. Logarithms and Common Logarithms : Definition logarithm of product division of number raised to any power, characteristics of the logarithm of any number greater than unity. Characteristics of the Logarithm of decimal fraction.
4. Trigonometrical functions of angles of any size and sign. Trigonometrical ratios of an, angle (90+)(180+)
5. Trigonometrically ratio of the sum and difference of two angles. Geometrical proof for Sin (AB) Cos (AB) product formula for Sin C, Sin D, Cos C, Cos D
6. Statistics : Calculation of mean, mode median and standard deviation, variance and mean deviation for grouped data using various formula

IV AGRIL. BOTANY ZOOLOGY:- (20 Marks)

1. Plant anatomy, (i) Root-Structure and Functions (ii) Stem-Structure and Functions (iii) Leaf Structure and Functions.
2. Agril Botany Zoology : Classification of plants. (i) Outline of classification of plants, (ii) study of the Following families, (a) Compositeae (b) Leguminoseae (c) Cucurbitae (d) Solanaceae. (e) Malvaceae (f) Cruciferae (g) Gramineae.
3. Plant Breeding and genetics, (i) Definition of Genetics and plant breeding and role of Genetics in plant breeding (ii) Cell-its structure and cell division (iii) Principle of inheritance, (iv) Self and cross pollinated crops, (v) Methods of breeding field crops.
4. Plant Physiology - (i) Respiration, types Function, (ii) Photosynthesis (iii) Transpirations (iv) Plant growth arid development. Animal Kingdom- (i) Classification of animal kingdom, (ii) Useful and harmful - insects of agriculture- Silk-worm, Honey bee, LAC insect, Termites, Grass hopper, grass caterpillar Anatomy and physiology Elementary internal anatomy of grass hopper, earthworm and cockroach with reference to digestive, Respiratory and reproductive system.

पशुपालन एवं कुक्कुट पालन के तत्व

Elements of Animal Husbandry and poultry Farming (Ag-3) (60 Marks)

(A) 1 . Introduction - (i) Importance of Live stock in Indian Economy (ii) Body Parts of cow and buffalo and description of important systems; respiratory digestive, reproductive, secretion of milk.

2. Improved Cattle Breeds - (i) Cow (ii) Buffalo (iii) Goat and (iv) Sheep.

3. Care and management of Cattle - (i) Animal Hygiene (ii) Cattle housing - sheds for bullocks, bull milch cattle etc. (iii) Special attention for rearing of calves, pregnant and milch cattle, working bullocks and bull.

4. Breeding of cattle - (i) Breeding : Line breeding and cross breeding, Mendel's laws of breeding.(ii) Artificial insemination in cattle with examples.

5. Dairy Farming - (i) General idea regarding dairy farming as a business in village and town conditions, requirement of land, labour, capital, management techniques (ii) Scope of dairy farming - white revolution in India.

6. Milk production- (i) Different methods of milking, (ii) Principles of clean milk production, (iii) Factors affecting quality of milk.

7. Composition of milk- (i) Definition of Milk (ii) Milk constituents, (iii) composition of Milk Factors affecting composition of milk.

8. Physical properties of milk - (i) Temperature (ii) Boiling Freezing point (iii) pH (iv) Density (v) Sp. Gravity, Use of lactometer (vi) Gerber's method for fat test.

9. Feed and Feeding (i) principles of Feeding of dairy cattle, (ii) Different types of feeds and fodders and their nutritive values-kharif and Rabi fodders; Hay and Silage crops (iii) Preservation of , fodders : making of silage, hay silopits. (iv) Computation of balanced ration of cows, buffaloes, bullocks, bulls goats and sheep.

10. Judging of Cattle (i) Importance of Judging, (ii) Judging method. Score card method and on the basis of body parts, (iii) Judging the age of cattle by rings on the horn and by the teeth development.

11. Dairy appliances - (i) Construction of appliances and their cleanliness (ii) working of cream separator and its parts. Butter churner, Butter worker.

12. Milk products - (i) Preparations of Cheese, Gream, Ravri, Dahi, flutter, Ghee, Condensed milk, Milk powder and their composition.

13. Common diseases of Cattle- (i) Symptoms of sick Animals, (ii) Symptoms of different diseases. Rinderpest. Foot and Mouth disease, Blackquarter, Haemorrhagic Septicaemia, Anthrax and piroplasmosis; (iii) Their prevention and control measures.

14. Poultry Farming- (i) Introductory, (ii) Scope and limitation of Poultry Farming (iii) Important breeds of poultry for eggs, meat, (iv) Hatching of eggs and uses of incubator.

15. Housing and ration for poultry birds- (i) Poultry sheds, layout model sheds, (ii) Ration of poultry bird Chicken, Grower, Layers and Broilers.

16. Diseases of Poultry - (i) Preventive control measures, (ii) Bacillary. White diarrhoea, Ranikhet, Coccidiosis, Fowl Pox, Fowl, cholera, Ecto and endoparasites.

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