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MAHARANA PRATAP UNIVERSITY OF AGRICULTURE & TECHNOLOGY UDAIPUR



15th JOINT ENTRANCE TEST-2006

Information Bulletin & Application Form

For Admission To :

B.Sc. Agriculture (Honours)
B.Sc. Home Science (Honours)
B.Sc. (Horticulture)
B.Sc. (Forestry)

Udaipur court alone shall have jurisdiction to determine all disputes pertaining to the interpretation of provisions of JET

(TO BE RETAINED BY THE CANDIDATE)

Co-ordinator, JET/Pre PG 2006, MPUAT, Rajasthan College of Agriculture, Udaipur-313 001
Phone/ Fax: 0294-2423119 Website: www.mpuat.ac.in

FACULTY WISE TOTAL NUMBER OF SEATS

1. Agriculture (560)

(i)	S.K.N. College of Agriculture, Jobner, Distt. Jaipur	80
(ii)	Rajasthan College of Agriculture, Udaipur	80
(iii)	College of Agriculture, Bikaner	40
(iv)	S.K. College, G.V., Sangaria, Distt. Hanumangarh	60
(v)	Dayanand College, Ajmer	60
(vi)	Govt. P.G. College, Sawaimadhopur	60
(vii)	B.B.D. Govt. P.G. College, Chimanpura (Shahpura) Distt. Jaipur	60
(viii)	Parmanand Degree College, Gajsinghpur, Distt. Sriganganagar	120

2. Home Science (106)

(i)	College of Home Science, Udaipur	46
(ii)	College of Home Science, Bikaner	60

3. Horticulture and Forestry (40) (College of Horticulture & Forestry, Jhalawar)

(i)	B.Sc. Horticulture	25
(i)	B.Sc. Forestry	15

- Note :**
1. The reservation of seats for various categories will be as per rules of Govt. of Rajasthan, ICAR, Rajasthan Agricultural University, Bikaner and Maharana Pratap University of Agriculture & Technology, Udaipur, notified from time to time. One seat is reserved in the memory of Sh. Karan Narendra Singh at Jobner (Founder Quota) in B.Sc. Ag.(Hons.)
 2. In University constitute colleges 15% seats are reserve for ICAR quota.
 3. Admission to B.Sc. Home Science (Hons.) is restricted to girl candidates only.
 4. One seat in each college is reserved for the wards of Kashmiri migrants and the admission will be made on the basis of merit. Application be submitted through Secretary Government of India, Ministry of HRD, Department of Secondary education/Higher education, New Delhi, or Secretary Higher education, Government of Rajasthan, Jaipur.

INSTRUCTIONS

FOR THE ADMISSION TO THE UNDERGRADUATE COURSE PROGRAMME IN AGRICULTURE/HOME SCIENCE/HORTICULTURE/FORESTRY

- ★ Candidates can download Application form along with Admit Card and Duplicate Admit Card and submit to the Coordinator along with demand draft of Rs. 500 /- for General/ OBC category and Rs. 250/- for SC/ST/PH category payable in favour of the Comptroller, MPUAT, Udaipur.
- ★ Candidates are required to complete the application form and transmit the same for appearing in Joint Entrance Test to the Co-ordinator JET/PRE-PG-2006, Maharana Pratap University of Agriculture & Technology, Rajasthan College of Agriculture, Udaipur 313 001.
- ★ The application form shall not be entertained in any case if received after 5.00 PM on 25st May, 2006 or incomplete, in the office of the Co-ordinator JET/PRE-PG-2006, Maharana Pratap University of Agriculture & Technology, Rajasthan College of Agriculture, Udaipur & the photograph pasted on it, is not attested by the Principal of School/College last attended.
- ★ The candidates applying for admission to more than one programme shall submit only one application form.
- ★ Candidate awarded supplementary in qualifying examination, even if standing in merit of JET, will not be considered for admission.
- ★ The examination shall be held on Tuesday 27th June, 2006 from 9.00 AM to 11.00 AM at the centres specified by the University (Bikaner, Jobner, Udaipur, Jaipur, Ajmer).

ELIGIBILITY

1. **Age :** The maximum age limit is 25 years as on 1-1-2006 (Those born on or before 1-1-1981 are not eligible).
2. **Educational requirement:**

The candidates who have passed the Senior Higher Secondary (10+2) examination conducted by the Board of Secondary Education, Rajasthan, Ajmer or any other Statutory Board or any examination recognized equivalent to it by Maharana Pratap University of Agriculture & Technology, Udaipur, in the following subjects are eligible to appear in JET :

Course programme	10+2 Examination-Subject Group
Agriculture, Horticulture and Forestry	Agriculture (Academic stream) Physics/Chemistry/Biology Physics/Chemistry/Mathematics, Physics/Chemistry/Mathematics/Biology

Course programme	10+2 Examination-Subject Group
Home Science (Only for female candidates)	Home Science group (Home Science as one subject with other two subjects of Arts will not be eligible) (Academic Stream) Agriculture (Academic Stream) Physics/Chemistry/Biology Physics/Chemistry/Mathematics Physics/Chemistry/Mathematics/Biology

A candidate must have secured atleast 50% marks in the aforesaid examinations (10+2). A relaxation of 5% marks would be allowed to candidate belonging to SC/ST/OBC category.

Candidates who have appeared at any of the aforesaid qualifying examinations but whose results have not been declared before the commencement of the JET shall provisionally be allowed to appear at the JET.

3. Residential Requirement:

A candidate must fulfil the following conditions for admission to the various faculties:

The candidate must have studied for last three years of qualifying examination continuously as a regular candidate in a recognised Institution in Rajasthan.

OR

Natural Father/Mother of the candidate has been continuously residing in Rajasthan for a period of last 10 years and the candidate has studied for atleast 5 years during this period in a recognised educational Institution in Rajasthan.

OR

The candidate must be a bonafide resident of Rajasthan. He/She may be presently studying in any of the states other than Rajasthan.

OR

The candidate is a Son/Daughter of a serving or retired employee of (a) Government of Rajasthan including Officer of All India Services Borne on the State Cadre of Rajasthan or (b) Undertaking/Corporation/Improvement Trust/Municipal Bodies duly constituted by the Government of Rajasthan by an act of Law or (c) any of the Universities in Rajasthan or Secondary Board of Education, Rajasthan provided that employee has worked in Rajasthan for three years preceding the last date of submission of the application.

OR

Candidate is a Son/Daughter of a permanent or retired employee of Indian Defence Service and the employee is either of Rajasthan Origin irrespective of his place of posting or is posted in Rajasthan at the time of last date of the application for admission provided that in case the Defence Personnel is of the Rajasthan origin, a Certificate has to be submitted by him from the employer to the effect that his State of origin is Rajasthan at the time of his entry in to service.

The eligible candidate shall be admitted as per following priorities-cum-merit of the JET Examination:

Priority-I : Widows/Wards of Defence Personnel killed in action.

Priority-II : Wards of serving personnel and ex-serviceman disabled in action.

Priority-III : Widows/Wards of Defence Personnel who died in peace time with death attributable to military service.

Priority-IV : Wards of Defence Personnel disabled in peace time with disability attributable to military service.

Priority-V : Wards of ex-servicemen and serving personnel who are in receipt of following Gallantry Awards :-

- | | |
|--------------------------------|------------------------------------|
| (1) Param Vir Chakra | (7) Vir Chakra |
| (2) Ashok Chakra | (8) Shaurya Chakra |
| (3) Sarvottam Yuddh Seva Medal | (9) Yuddh Seva Medal |
| (4) Maha Vir Chakra | (10) Sena, Nausena, Vayusena Medal |
| (5) Kirti Chakra | (11) Mention-in-despatches |
| (6) Uttam Yuddh Seva Medal | |

Priority-VI : Wards of ex-servicemen.

Priority-VII : Wards of serving personnel.

OR

Candidate is a son/daughter of permanent (serving/retired) employee of Para-Military Forces of India and the employee is either of Rajasthan origin irrespective of his place of posting or is posted in Rajasthan at the time of last date of application for admission provided that in case of Para-Military Personnel from the Rajasthan origin, a certificate has to be submitted by him from the employer to the effect that his State of origin is Rajasthan at the time of his entry into service.

OR

Candidate is a son/daughter of a Judge of Rajasthan High Court subject to that he/she submits an undertaking/affidavit stating that such benefit is not claimed or availed by them in any other State.

Note:

1. The relevant certificates which are the basis of eligibility of the candidate will have to be furnished by the candidate at the time of counselling.
2. The certificate of bonafide resident of Rajasthan will have to be duly signed by the District Magistrate of the concerned District or officer authorised by him.
3. In case of serving personnel, where service conditions have resulted into eligibility, a certificate of the employer will have to be submitted by the candidate.

JOINT ENTRANCE TEST

All candidates applying for JET will have to appear at the examination to be conducted by the Maharana Pratap University of Agriculture and Technology, Udaipur. Application forms for JET for admission to the B.Sc. Ag. (Honours), B.Sc. Horticulture, B.Sc. Forestry, and B.Sc. Home Science (Honours), after being duly filled in by the candidates must be sent directly to the Co-ordinator. **The eligible candidates will be admitted in order of merit in all cases. Only one application form is sufficient for all programmes.**

Candidates securing equal number of marks in JET will be admitted in the following order of preference:

- (i) One who has secured more marks in Senior Higher Secondary (10+2) or its equivalent examination.
- (ii) Among candidates securing equal number of marks in (10+2) or its equivalent examination also, those who have passed in lesser number of attempts will be given

preference. If there is a further tie, candidates securing more marks in Secondary Examination or the equivalent examination will be given preference.

The Maharana Pratap University of Agriculture & Technology, Udaipur reserves the right to reject admission of any candidate, if there are reasons to do so and detected even after test is held.

SEAT ALLOTMENT

Candidates eligible for admission in Agriculture, Horticulture, Forestry, and Home Science shall be allotted seats as per their category through Option Form based on merit and order of option given by the candidate.

Candidates must submit option forms along with DD of Rs. 4000/- payable to **Comptroller, Maharana Pratap University of Agriculture and Technology, Udaipur** on or before date and time mentioned on the back cover page. Forms received after this date and time will not be considered.

After first seat allotment and reporting of candidates in the respective Colleges on stipulated date, the vacant seats of different categories will be filled by upward assessment and other candidates stand in the merit.

Similar system will be followed for third seat allotment. No further allotment will be made even the seats remain vacant.

UPWARD ASSESSMENT (Transfer/change of subject of higher choice)

The admitted candidates reported in the college are eligible. The upward assessment will be made on the basis of Option Form already submitted by the candidate. No new option will be allowed. They should submit application to the Head of the Institution for upward assessment along with fees of Rs. 200/- (This fees is transferable to Co-ordinator). Only those candidates will be considered for upward assessment whose name reach the Co-ordinator on or before stipulated date and time. After new allotment they will loose their claim on the previous sheet. Thereafter no request for change will be entertained.

Candidates who fail to report in respective college on the stipulated date will not have any claim for admission and their total fees will be forfeited.

All the original documents of candidates have to be thoroughly checked as well as tallied with information provided by the coordinator by respective College Principal/Dean. False information/certificate will liable to cancel the admission and fees will be forfeited.

All candidates provisionally admitted will be examined by the Medical Board appointed by the Dean/Principal of concerned College regarding their general and physical fitness. The candidates found unsuitable will be rejected. The decision of the Board in this respect will be final.

PROVISION FOR REAPPEARING IN JET

For candidates already studying in any said programme in the State of Rajasthan, desiring to appear again in current JET, application form must be forwarded through the concerned Dean/Principal. The qualified candidates of these programmes or appearing in Final Year are not eligible.

Note: Any Person other than the parents of the candidate can become guardian, only if the parents of the candidate are not alive or have been declared insane.

SCHEME OF EXAMINATION

1. In the very nature of competitive examination, no syllabus can be prescribed. However, it is an exercise to pick up the best. There would be a single question paper for all the candidates appearing in JET-2006 for seeking admission in the Undergraduate programme in Agriculture/ Home Science/Horticulture/Forestry.
2. The Question Paper would be divided into six subjects:
 - (i) Physics
 - (ii) Chemistry
 - (iii) Mathematics
 - (iv) Agriculture
 - (v) Biology
 - (vi) Home Science

The candidates desiring admission in Agriculture/ Horticulture/Forestry would have to attempt any three subjects except Home science while female candidates desiring admission in Home Science can attempt any three subjects out of all above six.

3. The question paper will consist of multiple choice type questions (pick up the most suitable answer).
4. The question paper will be in the form of a test booklet containing different subjects:

Physics, Chemistry, Mathematics, Agriculture, Biology and Home Science each is having 40 questions. There would be four suggested answers [(1), (2), (3), (4)] to each question.
5. The candidates are required to choose the correct answer and blacken the corresponding circle with the pen in the answer sheet (Details for filling answer sheet is given on side 1st of sample answer sheet). The test booklet may be used by the students for rough work and the squares printed in it may be used for deciding the correct alternative answer. It will be collected from them at the end of examination alongwith the answer sheet. Assessment will be made only on the basis of the answer sheet.

Three marks will be awarded for every correct answer and one mark will be deducted for every wrong answer. **Thus, there will be negative marking.**

The merit list will be prepared on the basis of the aggregate marks obtained by the candidates, either appearing in one/more than one programme.

SYLLABUS FOR JET

PHYSICS

(40 Questions)

Unit - A

(8 questions to be set from this section)

Dynamics of a particle:

Conservative and non-conservative forces, Motion of a particle under different types of forces or potentials : constant, linearly varying and variable conservation of linear momentum and energy. Application, direct and oblique collision between particles, elastic and inelastic collisions. Static and dynamical problems involving forces and conservation laws.

Rotational motion:

Centre of mass and its calculation for a two or more particle system and for rigid body. General motion of a rigid body, nature of rotational motion, rotational motion of single particle in a plane, torque, angular momentum and its geometrical and physical meaning, conservation of angular momentum. Examples of circular motion : car on a level circular road, car on a banked road, pendulum or particle swinging in a vertical plane. Rigid body rotation and conservation of its angular momentum. Comparison of linear and rotational motions. Definition of moment of inertia, parallel axis theorem. Perpendicular axis theorem for a plane lamina. Calculation of M.I. in case of ring disc, cylinder and sphere. Motion of a rigid body on an inclined plane.

Unit - B

(8 question to be set from this section)

Heat & Thermodynamics:

Heat & Temperature, Zeroth law of thermodynamics, mechanical equivalent of heat, First law of thermodynamics, thermodynamics state isothermals and adiabatics. Pressure temperature and pressure volume indicator diagrams. Work done during isothermal and adiabatic process, equilibrium process and phase changes, Evaporation. Thermal expansion, variation of volume and pressure of a gas with temperature, Transfer of heat conduction, convection and radiation.

Thermodynamics:

Reversible and irreversible thermodynamics processes, Carnot cycle, Second law of thermodynamics, efficiency of heat engine. Heat engines; steam and internal combustion engines (description only).

Radiation:

Nature of heat radiation emissive and absorptive powers of body, black body, emissivity, Kirchhoffs law with illustrations. Stefan's law and Newton's law of cooling, distribution of energy in Black body spectrum. Wiens displacement Law, idea of Plank's law of radiation.

Unit - C

(8 question to be set from this section)

Waves:

Wave motion, longitudinal and transverse waves, wave length, frequency, time period, amplitude of a wave. Sound waves, velocity of sound waves. Equation of a simple harmonic wave, displacement, velocity and acceleration of a particle during propagation of a wave. Reflection and refraction of a wave. Superposition of waves, interference of sound waves, beats, stationary waves, nodes and antinodes. Stationary waves in pipes and strings, Resonance tube. Elementary ideas of musical scale and acoustic of buildings. Doppler effect in sound waves.

Wave Optics:

Interference phenomenon; conditions of sustained interference. Young's double slit experiment, Fresnel's Bi-Prism, Fringe-width and determination of wave length, Diffraction : diffraction phenomena : Fresnel's and Fraunhofer class of diffraction, Fresnel's half period zone theory. Diffraction due to a circular obstacle and circular aperture on axial points. Diffraction due to a single slit (qualitative). Resolving power of telescope and microscope. Polarisation : polarised and unpolarised waves. Plane polarised, circularly polarised and elliptically polarised light. Identification of polarised and unpolarised light by-polaroid. Methods for obtaining the plane polarising length.

Relativity:

Necessity of the theory of relativity. Postulates of special theory of relativity, consequences, qualitative information about length contraction, time dilation and mass energy relation.

Unit - D

(16 question to be set from this section)

Electrostatics:

Electric field vector. Free and bound charges in conductors and insulators. Behaviour of electric field and potential inside and on the surface of a conductor and a dielectric flux, Gauss Law and its applications in calculating electric field at any point due to a uniformly charged spherical shell, spherical conductor, sphere made up of volume distribution of charge, sheet of uniform charge density of infinite dimensions made up of a dielectric or of a conducting material, a line charge of infinite length. Force on the surface of a charged conductor Energy density in an electric field. Capacity; capacity of a spherical conductor, sharing of charges between two conductors, condenser, capacity of a parallel plate and spherical condenser, condensers in series and parallel. Energy of a charged condenser.

Kirchhoffs Laws:

Kirchhoff Laws of electrical circuits and its application to electrical circuits.

Potentiometer ; Principle of potentiometer. Measurement of EMF and small potential difference, calibration of voltmeter and ammeter and measurement of internal resistance of a primary cell.

Magnetic effects of current:

Ampere's law and its applications : Magnetic induction at any point due to a long straight current carrying wire, magnetic induction inside a long solenoid, magnetic induction inside a toroid.

Electromagnet Induction:

Magnetic flux, Induced emf. Faraday's law Lenz's law. Induced current and energy balance in a rectangular loop moving in a non uniform magnetic Induction with a constant velocity, Back emf developed when a uniform magnetic induction between them, potential difference developed across a conducting rod moving with a conducting wire moves two parallel conducting rails carrying current with a uniform velocity across a uniform magnetic induction, a conducting rod rotating in a uniform magnetic induction with a constant angular velocity and a metal disc rotating in a uniform magnetic induction with a constant angular velocity. Rectangular coil rotating in a uniform magnetic induction. Self and Mutual induction.

Alternating currents:

Direct current alternating current, fluctuating D.C. and sinusoidal currents. Instantaneous, Average and root mean square value for A.C. Phase relationship between current and emf. in sinusoidal A.C., circuit containing (i) Pure resistance (ii) a resistance and an inductance, (iii) resistance and a capacitor. Impedance, resistance, reactance and susceptance. Series - L.C.R. resonant circuit, Q factor & Band with Power in an A.C. circuit wattless current Electrical devices & machines : transformers, induction coil, A.C. and D.C. generators and motors, choke and starter.

Electromagnetic waves:

Short history of e.m. waves (Maxwell, Hertz, Bose, Marconi) Basic concepts of electromagnetic oscillations, electromagnetic spectrum (radio-microwaves, infra red, optical, ultra violet, X-rays, gamma rays).

Photo Electric Effect and Matter Waves:

Photo electric effect, Einstein's explanation. Photo electric equation, photo cells.

De Broglie's concept of matter waves Davisson and Germer experiment, Thompsons experiment.

Semiconducting Electronic Devices:

Electrons in solids, classification of metals, semi-conductors and insulators. Intrinsic and extrinsic semi-conductors. P-type and N-type semi conductors. Semi conducting p-n junction diode and its characteristic. p-n-p and n-p-n junction transistors their characteristics and parameters. Application in simple ideas and working of C.R.O. radio television and computer (explanation of working with block diagrams).

CHEMISTRY

(40 Questions)

UNIT - A

(12 question to be set from this section)

Development of Classical model of an atom: (i) Bohr model of atom: Calculation of radius of Bohr's orbit and energy of an electron. (ii) Dual nature of a matter and radiation : Quantisation of electronic energy levels. Spectral evidence for quantisation. (iii) Sommerfield's extension (no mathematical treatment). (iv) De-Broglie Relation (v) Uncertainty Principle (vi) Orbitals and quantum numbers : Shapes of orbitals spatial distribution of atomic orbitals. (vii) Distribution of extra nuclear electrons, Aufbau principle, Pauli's exclusion principle, Hund's rule, $n+1$ Rule, variation in relative energies of orbitals with increase in atomic number, electronic configuration of elements (s.p.d.f. block elements). Stability of half filled and filled sub-shells.

Periodic Table and Periodicity in Properties: (i) Electronic configuration and predictable; The long form of periodic table and s.p.d.f. block elements. Advantages over mandeleef periodic table. (ii) Electronic configuration and Periodicity in properties, periodic perspectives. (iii) Detailed study of periodicity in physical and chemical properties with special reference to : Density, Melting and boiling points of elements. Atomic and ionic radii. Ionisation potential. Electron affinity. Electronegativity, variation of effective nuclear, charge in a period, metallic character, diagonal relationship.

Chemical bond: (i) Lewis structure - Octet rule and its limitations. (ii) Ionic bond; Characteristics of ionic compounds, Solubility of ionic compounds. (iii) Covalent bond introductory concept of overlapping of orbitals and bonds, valency bond theory : Characteristics of covalent compounds. Coordinate bond, partial covalent character in ionic bond, partial ionic character in covalent bond. Fajan's rule, Polarities of covalent molecules, (iv) Bond length, bond angle and bond energy-general consideration. (v) Hybridisation of orbitals illustrated with example of compounds of first and second row elements in periodic table : Shape of common molecules - VSEPR Theory. (vi) Hydrogen bond. (vii) Vender waals forces of attraction.

Oxidation-Reduction (Redox reaction): (i) Concept of formal charge on ions. (ii) Oxidation number. (iii) Oxidation reduction ion-electron concept with examples. (iv) Redox reaction-examples (v) Balancing of equations by ion-electron method.

Chemical Equilibrium: (i) Concept of reversibility equilibrium constant. (ii) Law of mass action-generalized expression. (iii) Experimental method for verification of the law of mass action. Factors affecting equilibrium (concentration, pressure, temperature). (iv) Application to systems such as $N_2+3H_2 \leftrightarrow 2NH_3$, $PCl_5 \leftrightarrow PCl_3 + Cl_2$, $N_2 + O_2 \leftrightarrow 2NO$ (v) Le chetellier's Principle-Application.

Rates of Chemical Reaction : (i) Rate of reaction, (ii) Instantaneous rate of a reaction and order of reaction (I and II order) (iii) Factors affecting the rates of reaction factors affecting rate of encounter between reactant molecules effect of temperature on the reaction rate, concept of activation energy, Catalysis). (iv) Effect of light on rates of reaction. (v) How fast are chemical reaction?

Ionic Equilibria: (i) Electrolytes and non-electrolytes. (ii) Arrhenius theory : Evidence in favour of dissociation theory. (iii) Ionic product of water. (iv) Hydrolysis degree of hydrolysis, hydrolysis constant (v) Relation between Hydrolysis constant. Ionic product of water and dissociation constant. (vi) Common ion effect. (vii) Solubility product and its application to qualitative analysis.

Acids and Bases : (i) Hydrogen and hydroxyl ion in aqueous solution (ii) Brunsted-Lewis concept of acids and bases, (iii) Dissociation of acids. (iv) pH value. (v) Buffer solution. (vi) Theory of indicators of acid-alkali titrations. (vii) Choice of indicators. Energetics : (i) Energy changes during a chemical reaction. (ii) Internal energy and enthalpy (Internal energy, enthalpy and enthalpy changes. Origin of enthalpy change in a reaction, Hess's law of constant heat Summation), (ii) Heats of reactions (Heat of neutralization, heat of combustion, heat of fusion and vaporization). (iv) What decides the direction of spontaneous change in a chemical reaction (an elementary idea of entropy and free energy change).

UNIT - B

(8 question to be set from this section)

Colloidal state of matter: (i) Crystalloid and collonis (ii) Classification of colloids : Emulsion, Preparation of colloids, Lyophilie and lyophobic colloids. (iii) Cataphoresis : Electrophoresis, Dialysis, Tyndall phenomenon, Brownian movement, Coagulation-Hardy and Schulze's law, Petisation, Absorption, Applications.

Metals: (i) Nature of metallic state : Structural packing of atom in metals. Metallic Bond-Valency bond concept. (ii) Occurrence of metals in nature. (iii) General principles of metallurgy : Activity series of metals standard Electrode Potential, Metallurgical Processes. (iv) Extraction of metals : Copper, silver, Aluminum and iron.

's'-Block elements : (i) General characteristics. (ii) Trends in variation of properties in periodic table of alkali and alkaline earth metals (iii) General principles of extraction the elements. (iv) General. Chemistry of three compounds.

d-Block elements : (i) General characteristics. (ii) Elementary idea about paramagnetism and diamagnetism. (iii) Different oxidation states. (iv) Chemistry of transition elements as illustrated by different oxidation states of the following metals : Silver, Gold, Chromium, Manganese and Iron.

Note: Numerical problems on principles involved in topics included in syllabus and on the volumetric exercises would be set.

UNIT - C

(20 question to be set from this section)

Valency of carbon and Hybridisation: (i) Tetra-Valency of carbon atom, Kekule, Vant-Hoff and Le-Bell theories. (ii) Orbital representation of covalent bond, multiple bonding (sigma bond; Pi bond) (iii) Hybridisation (sp , sp^3 , sp^2 Hybridisation) (iv) Orbital structure of acetylene, ethylene and methane. (v) Concept of bond length, bond strength and bond angle. (vi) Electronegativity, Inductive effect, polarity of covalent bond, formal charge polarity of carbon, Halogen bond.

Structure and Reactivity: (i) Bond fission, Free-radicals, Ions (Carbonium and carbanion) (ii) Acids and bases, Arrhenius concept, Bronsted-Lowry concept, Lewis concept. (iii) Nucleophilic and Electrophilic reagents. (iv) Types of Organic Reaction and their mechanism : Substitution Rearrangement Reaction. (vi) Markonikoff's Rule and Peroxide effects.

Pyrolysis : (i) Petroleum as a source of Hydrocarbons. (ii) Origin of Petroleum. (iii) Mining of Petroleum. (iv) Refining of Petroleum. (v) Artificial production of petrol (a) cracking (b) isomerization (c) synthetic method, (vi) Knocking (vii) Octane number, (viii) Flash point.

(Grignard reagents) Organo Metallic compounds: (i) Organometallic compounds, definition, preparation of Grignard reagents (iii) Properties and synthetic uses of Grignard reagents.

Saturated hydrocarbons (upto 5 carbon atoms): Nomenclature and isomerism. (ii) General methods of preparation of alkanes. (iii) General properties and uses of alkanes. (iv) Individual members Propane, Butane, Pentane (v) Interconversions of alkanes.

Unsaturated Hydrocarbons: (i) Nomenclature and Isomerism. (iii) General methods of preparation of Alkenes and Alkynes. (iii) General properties and uses of alkene; and alkynes with reaction mechanism. (iv) Individual members. Propene, Butene, Propyne and Butyne.

Organic chemistry based on Functional groups: (i) Halides. Nomenclature and isomerism, General methods of preparation of mono alkyl Halides; General properties of mono alkyl Halides with reaction mechanism. Preparations and properties of dihalogen Derivatives., Synthetic uses of alkyl halides; Preparation, properties and uses of carbon tetrachloride (ii) Hydroxy compounds : Nomenclature and, Isomerism; Classification of Monohydric alcohols; General methods of preparation of Monohydric alcohols; General properties and uses of Monohydric alcohols; Hydrogen bonding in alcohol and its effect on boiling point and solubility; Test for alcoholic groups; Inter conversion of methanol and ethanol.

Organic chemistry based on functional groups: (i) Carbonyl groups : Nomenclature and isomerism of aldehydes and ketones, General preparations of aldehydes and ketones, General properties and uses of aldehydes and ketones with reaction mechanism; Polarity of carbon-oxygen double bond; Test for aldehydes and ketones. (ii) Carboxylic group, Nomenclature and Isomerism. General Preparations of monocarboxylic acids, general properties and uses of carboxylic acid, hydrogen bonding in carboxylic acids, resonance.

Derivatives of monocarboxylic acids: (i) Kinds of acid derivatives (a) Acid chloride (b) Acid-anhydride (c) Acid amide (d) Esters (ii) Effect of carbonyl group in acid derivatives, (iii) Properties and uses of (a) Acetyl chlorides (b) Acetic anhydride (c) Acetamide (d) Ethyl acetate.

Aliphatic amines: (i) Nomenclature and Isomerism (ii) General methods of preparation of primary amines (ii) General properties and uses of primary amines. (iv) Laboratory method of preparation of methyl amine and ethylamine. (v) Properties and uses of methylamine and ethylamine (vi) Tests for amines.

Derivatives of carbonic acid urea: (i) Methods of preparation of urea (i) Properties and uses of urea.

Aromatic Compounds : (i) Characteristics of Aromatic compound; (ii) Nomenclature and isomerism, (iii) Substitution in Benzene ring (iv) Preparations, properties; and uses of Benzene (with reaction mechanism) (v) Laboratory and industrial preparation of Nitro benzene. (vi) Properties; and uses of Nitrobenzene. Test for Nitrobenzene (vii) Methods of preparation, properties and uses of aniline (viii) Test for aniline. (ix) Methods of preparation, properties and uses of phenol. (x) Test of phenol (xi) Difference between alcohols and phenols.

Synthetic and Natural Polymers: (i) Classification of polymers (ii) Some important natural and synthetic polymers with their general methods of preparation.

Chemistry in Action: (i) Dyes (ii) Chemicals in medicines (iii) Plant growth hormones, Pheromones (iv) Fertility contraceptives materials-chemo-sterilants.

BIOLOGY

SECTION - I BOTANY

(20 Questions)

UNIT - A

(8 Questions)

1. Unity of Life: Structural organization of the cell. Light and electron Microscopic structure of cell. Prokaryotic and eukaryotic cells. Plant and animal cells. Cell organelles and their functions-nucleus (including DNA and RNA structure), mitochondria, chloroplast, endoplasmic reticulum, Golgi complex, lysosomes, microbodies, microfilaments, micro (tubules) ribosomes, centriole, cell wall, cilia and flagella, vacuoles, cell inclusions-starch grains, mineral crystals. Cell division amitosis, mitosis and meiosis. Comparison of mitosis and meiosis. Significance of meiosis. Cell cycle.

2. Continuity of Life: Mendel's experiments with pea and the reasons for this success. Mendel's laws of inheritance. Mono and dihybrid crosses. Chromosome structure and morphology. Chromosomes and genes, Chromosome hypothesis. Linkage, crossing over. Mutations. Sex determination, genetic code, transcription and translation.

3. Plant Physiology: (i) Water relation of cell, semipermeable membranes, osmosis, diffusion pressure deficit (DPO), water potential, plasmolysis. Transpiration-types, factors affecting rate of transpiration, Guttation. Absorption of water. Root as organ for absorption. Active and passive absorption of water and minerals. (ii) Ascent of sap, path of ascent of sap, theories explaining ascent of sap (iii) Mineral nutrition-Role of minerals in plant growth, macro and micro elements for plant growth, trace elements. (iv) Enzymes-introduction, enzymes as bio-catalysts, nature, classification and mode of enzyme action. (v) Respiration-definition, comparison of respiration and fire. Types of respiration-aerobic, anaerobic and fermentation processes, Respiratory substrate, Respiratory quotient, Respiration sites, Mechanism of aerobic and anaerobic respiration Glycolysis, Krebs cycle and alcoholic fermentation. Electron transport chain and Oxidative phosphorylation. Energy yield (Kilo calories). Factors affecting respiration. (vi) Photosynthesis-definition, role of water, chlorophyll and carbon-di-oxide. Light and dark reactions, photophosphorylation, Hill reaction, Red drop, two pigment system, Calvin cycle, Photo respiration, Chemosynthesis (brief account) Factors affecting photosynthesis. (vii) Growth-definition, phases of growth. Plant hormones (Auxins, Gibberellins, Kinins and ethylene) and growth regulation, action on various physiological processes. Factors affecting growth Vernalization and Photoperiodism. (viii) Plant movements : a brief account of various types of plant movements with suitable examples.

UNIT - B

(4 Questions)

4. Environmental Biology: Definition of ecology and environment. Environmental factors climatic, edaphic and biotic. Plant communities and their characteristics (Density, frequency and abundance) Plant adaptations in relation to water-xerophytes, mesophytes, hydrophytes etc. Interaction between environment and organism. Ecosystem concept. Trophic levels Producers, Consumers, decomposers. Food chain and food web. Ecological pyramids. Environmental Pollution-air and water sources and major pollutants, their effects and methods of control of pollution including nuclear fallout and waste disposal. Noise pollution-sources and effects

Natural resources and their conservation. Waste land their improvement and forest conservation. Causes for the extinction of wild life. Conservation of wild life and concept of endangered species (Red data book). Indian examples.

UNIT - C

(8 Questions)

5. Botany and Human Welfare: Domestication of plants-historical account, improvement of crop plants-Plant breeding and plant introduction. Use of bio-fertilizers, economic and ecological

aspects. Use of pesticides : advantages and hazards. Economic botany (Botanical name, family, plant parts used and uses) of the following :

Cereals	-	Wheat and rice
Millets	-	Bajra
Pulses	-	Gram
Fibres	-	Cotton, hemp and sacharum (Moonj)
Oil Seeds	-	Groundnut, brassica, castor
Sugar	-	Sugarcane
Fruits	-	Mango and banana
Medicinal Plants	-	Guggal (<i>Commiphora</i>)

Serpigandha (*Rauwolfia*), Belladonna (*Atropa*) and opium (*Papaver*)

SECTION - II ZOOLOGY

(20 Questions)

UNIT - A

(6 Questions)

1. Anatomy and Physiology: Comparative account of various systems such as skin, skeleton, digestive, respiratory, circulatory, excretory, nervous. Reproductive and endocrine system of rat with those of frog. Structure, anatomy, life processes and life history of the following (mention economic importance also where relevant) : Hydra, Earth worm and Cockroach.

UNIT - B

(6 Questions)

2. Developmental Biology: Definition, scope and history of embryology, forms of reproduction, Basic features of embryonic development. Phases of embryonic development mentioning, gametogenesis fertilization, cleavage and blastulation, gastrulation, organogenesis, Morphogenesis and differentiation. The male gamete structure and formation, the female gamete its structure formation and type of eggs, the role of yolk. Fertilization, cytofertilization external and internal fertilization, mechanism of fertilization, short account of parthenogenesis. Cleavage-its characteristics, patterns and types. Blastula its types, stereoblastula, coeloblastula, discoblastula and superficial blastula. Gastrulation-the beginning of Morphogenesis, definition of gastrulation, the various gastrular movements or formative or morphogenetic movements namely, epiboly, emboly with their further sub division into invagination, involution, ingression and delimitation.

The formation of Tadpole in frog, its adaptation to its habitat and habits, metamorphosis, changes during metamorphosis.

UNIT- C

(8 Questions)

3. Genetics and Evolution (Fundamentals Only): Human genetics, human chromosomes, sex-determination sex-linked/inheritance, evidences and theories of organic evolution.

4. Man and Environment: Growth of human population through time in relation to socio-economic factors, present distribution and diversity of population, factors controlling them and to understand the contemporary nature of biology.

AGRICULTURE

(40 Questions)

This test is aimed at assessing general awareness of the candidates about the agriculture based activities in the state of Rajasthan. No syllabus is prescribed for this test. However, for convenience of the candidates the following broad outline is suggested.

UNIT – 1

(14 Questions)

General proficiency and general knowledge in Agriculture: General knowledge of the physiographic conditions of Rajasthan. Contributions of major arable crops & livestock to state Exchequer, major endowments of Rajasthan and relief measures provided in the successive plans; Major handicaps to agriculture and horticultural production.

Elements of climate and weather and their effect on crop growth. Agroclimatic zones of Rajasthan, soil fertility and productivity, saline and alkaline soils, acidic soils and their management, soil types of Rajasthan, soil erosion, methods of soil and water conservation.

Essential nutrients, functions, availability and their sources. Importance and types of organic manures and fertilizers, nitrogen, phosphorus and potassium fertilizers, straight, mixed and compound fertilizers. Methods of fertilizer application.

Importance of irrigation in crop production, sources of irrigation, water requirements of crops and factors affecting it, scheduling of irrigation, drainage and its importance, types of drainage, Characteristics of weeds, classification of weeds, weed-crop interference, prevention, control and eradication of weeds, methods of weed control. Use of herbicides for weed control in crops.

Study of the following crop with reference to climate and soil requirements, land preparation, varieties, seed treatment, seed rate, time of sowing, fertilizer application, irrigation, inter-cultural operations, plant protection, harvesting and threshing, yield, storage and crop rotations keeping in view the agro-climatic conditions of Rajasthan.

- Cereals - Paddy, Maize, Sorghum, Pearl millet, Wheat and Barley.
- Pulses - Green gram, Cowpea, Red Gram, Black Gram. Kidney Bean, Bengal Gram and Pea.
- Oil Seeds - Groundnut, Sesame, Soybean, Mustard, Linseed, Safflower, Sunflower and Taramira.
- Cash crop - Sugarcane, Potato and Tobacco.
- Fiber crops - Cotton and Sunhemp.
- Fodder Crop - Berseem, Lucerne, Oat, Clusterbean and Pearl millet.
- Spices - Fenugreek, Cumin and Coriander.

Characteristics of quality seed, seed germination and factors affecting it. Seed production-nucleus, foundation and certified seeds. Dry farming-importance characteristics, its principles, Crop production technology in dry farming areas. Mixed cropping, its types and benefits. Crop rotation, its principles and advantages. Tillage, objectives, primary and secondary tillage, Sowing methods. Seed treatment, seed dormancy and ways to remove seed dormancy.

UNIT – 2

(13 Questions)

Importance of fruit and vegetable production, present status and scope, selection of site for nursery. Raising nursery for flowers, vegetables and fruits. Transplanting of seedlings, soil and climate requirement, selection of site and planning for fruit orchard. Different layout systems, preparation and filling up of pits. Effect of adverse weather conditions like frost, hot winds, hail storm, drought, dust storm, heavy rainfall and protective measures. Problems of fruit crop and its remedial measures. Use of growth regulators. Study and control of harmful insects: aphid, jassid, white grub, locust, thrips, termite, mealybug. Major diseases of fruits and their control: wilt, dieback, canker, stemrot and mango malformation.

Importance, present position and scope of fruit and vegetable preservation, principles and method of fruit preservation, technique of canning, freezing and dehydration of fruits and vegetables. Preparation of jam, jelly, ketchup, squash, pickles & sauce. Study of following fruits with reference to climatic and soil requirement, improved varieties, propagation methods, manures & fertilizers, irrigation, harvesting, yield and insect-pest control : mango, citrus (orange, mausambi, lime), banana, guava, pomegranate, papaya, ber, datepalm, lehsuva, grapes, aonla and phalsa.

UNIT – 3

(13 Questions)

Importance of livestock in agriculture, importance of management in animal husbandry and dairying, characteristics, habitat and utility of following breeds :

- Cow - Gir, Tharparkar, Nagori, Rathi, Jersey and Holstein.
- Buffalo - Murrah, Bhadawari, Surti and Neeli.
- Goat - Jamunapari, Barbari, Toggenburg.
- Sheep - Marwari, Chokla, Malpura, Merino, Karakul.
- Poultry - Rhode Island Red, White leghorn, hybrid. Poultry farming and camel management.

Types, uses, doses and method of administration of following common medicines.

- Antiseptics - Phenyl, carbolic acid, Potassium Permagnate, Lysol.
- Purgatives - Magnesium sulphate, castor oil
- Stimulators - Alcohol, camphor
- Anthelminitics - Copper sulphate, phenovis
- Astringents - Tincture of iodine, alum
- Body massage oil - Terpentine oil

Causes, symptoms, treatment and control of following diseases :

Rinderpest, Foot and Mouth, Black quarter, Anthrax, Haemorrhagic septicemia Tick fever.

Milk-production, composition of cholostrum, clean milk production, milk preservation, milk analysis, quality control in milk. Determination of fat, apparent density, acidity and separation of cream and equipments required for separation curd and ghee. Cleaning and sterilization of dairy utensils and equipments.

HOME SCIENCE

(40 Questions)

The test is aimed at assessing general competence of the candidate's about the home science. No syllabus is prescribed for this test. However, for convenience of the candidates following broad outline is suggested:

Unit - I

(8 Questions)

General Proficiency in Home Science: Concept, objectives and scope of Home Science Education. Concept of Agricultural Universities, its objectives and functions, names of State Agricultural Universities in India. Relevance of Home Science in Agriculture Universities. Important Home Science Institutions in India.

Areas of Home Science - Objective and scope of each area.

Unit - II

(8 Questions)

Home Science in Rural Development: Major development programmes for rural community in India with special reference to Rajasthan. Role of Panchayati Raj in the implementation of development programmes, characteristics of rural, urban and tribal communities and their problems. Major Agro-climatic zones and their crops in Rajasthan National programmes related to conservation of environment.

Unit - III

(8 Questions)

Foods and Nutrition: Functions of food. Functions and sources of carbohydrates, protein, fat, vit, and minerals, malnutrition and its causes. Deficiency symptoms of various nutrients. Requirement of different nutrients for children and adults. Nutritive value of important cereals, pulses. Vegetable and milk and its products, storage of grains, preservation of fruits and vegetables.

Unit - IV

(8 Questions)

Human Development : Concept and importance of Human development. Principles of Human development, stages of human development and major characteristics of each stage, purpose of studying human development, basic needs and rights of children, importance of mother and child care, role of parents and community child's development, meaning and importance of Early Childhood education.

Unit - V

(8 Questions)

FRM and Clothing and Textiles : Human and materials resources available in the family. Fundamentals of Management process; decision making process. Importance of consumer education. General principles, selection and use of household equipments-pressure cooker, churners, blender-mixer, refrigerator. Elements and principles of design. Classification of fibres, properties of cotton, wool, silk and man made fibres. Care of clothes; removal of common stains-ink, vegetable; shoe polish, paint, nail polish, lipstick, rust, tea/coffee, fruits.

MATHEMATICS

(40 Questions)

Unit - A

(12 questions)

Algebra of complex numbers: Meaning of the symbol i , definition of a complex number, algebra of complex number, cube roots of unity, General and principal value, geometrical representation of a complex number (Argand diagram), modules and amplitude of a complex number, some properties of modules of a complex number, De Moivre's theorem and its applications. Circular and inverse circular functions of real and complex quantities, hyperbolic and inverse hyperbolic functions, separation of complex quantities (circular, hyperbolic, logarithmic, exponential functional and their inverses) into real and imaginary parts.

Relations and functions relations: Concept of relation, kinds of relation, equivalence relation, order relation and inverse of a relation. Function : Injective, surjective and bijective mappings, inverse of a function and composite function and their properties.

Matrices : Transpose of a matrix, adjoint and inverse of a square matrix, definition and ranks of a matrix, Application of matrix in solving simultaneous equations in three variables consistency and inconsistency of linear equation in three variables.

Vector : Scalar (dot) product of two vectors, vector (cross) product, their geometric significance, scalar triple product, vector triple product; Application of vector in the use of establishment of various geometrical results and problems of mechanics.

Unit - B

(12 questions)

Co-ordinate geometry : Circle : Parametric co-ordinates, Pair of tangents, chord of contact, equation of common chord of two circles, Pole and polar system of circles, circles passing through points of intersection of two given circles, one circle and one line, condition for orthogonality of two circles, definition and equation of radical axis of two circles.

Parabola : Definition, its standard equation, equation of the tangent and normal from a given point, chord of contact, diameter, pair of tangents, pole and polar and simple properties connected with parabola.

Three Dimensional Geometry : Concept of co-ordinates distance between two points, division of joint of two points in a given ratio, direction cosines and direction ratios of a line, cartesian equation of a line and plane in three dimensions. Angle between two lines, between a line and a plane also between two planes; distance of a point from a line and from a plane, skew lines & shortest distance between them.

Probability : concept of probability, Mathematical formulae for finding the probability of an event, mutually exclusive events and independent events, use of the following formulae :

- (i) $P(A+B) = P(A) + P(B)$ for any two mutually exclusive events A and B.
- (ii) $P(A+B) = P(A) + P(B) - P(AB)$ for any two events A and B.
- (iii) $P(\text{not } A) = 1 - P(A)$.
- (iv) $P(AB) = P(A)P(B)$ for any two independent events A and B, Conditional probability.

Unit - C

(16 questions)

Function : Definition of functions, variables, domain, range, explanation of the terms "undefined" "indeterminate", definition of even functions odd functions, periodic functions, increasing and decreasing functions, monotonic functions, composite functions, discussion of the graphs of exponential, logarithmic trigonometric and inverse trigonometric functions.

Limit and Continuity : Definition of the limit of a function, left and right hand limit, existence of limit, discussion of problems of limits of various functions, mathematical definition of continuity discussion of continuity and discontinuities at a given point.

Differentiability : Definition, left hand and right hand derivative, existence of derivative at a point, differentiability is a sufficient condition for continuity.

Derivatives : Derivatives of standard functions from the definition (Ab-initio), Derivative of sum, difference, product, quotient and function of a function, logarithmic, exponential function derivatives of implicit and explicit function and of Parametric functions derivative of one function with respect to the other.

Application of derivatives : Geometrical significance of dy/dx and its application in finding equation of tangent and normal at a point to a curve in cartesian and Parametric forms, orthogonal curves, use of dy/dx in determining intervals in which a function is monotonic or strictly monotonic and as a rate measures. Statement and geometrical illustration of Roll's theorem, statement, proof and geometrical, significance of Lagrange's mean value theorem.

Successive differentiation : Successive differentiation, Leibnitz theorem, expansion of functions by Maclaurin's and Taylor's theorems, Indeterminate forms, Maxima and Minima of one variable and of two variables connected by a relation.

Methods of integration : Definition of integration as the inverse of differentiation, elementary integration, integration of sum and difference function, integration by substitution and by parts.

Integration of functions : Integration of rational and irrational algebraic functions, integration of trigonometric functions.

Definite Integral : Definite integrals and their properties, definite integral as the limit of a sum.

Quadrature : Application of definite integrals in finding the area of a region bounded by a curve in Cartesian coordinates and x-axis or y-axis, area of the region included between two curves. Application of Simpson rule in finding area in Cartesian form.

IMPORTANT DATES AT A GLANCE

1.	Sale of Information Bulletin and Application Form	:	21-04-2006 to 20-05-2006
2.	Last date and Time of receipt of Application Form	:	25-05-2006 upto 5.00 PM
3.	Date of entrance examination	:	27-06-2006
4.	Declaration of result (on or before)	:	05-07-2006
5.	Last date for receipt of option form	:	15-07-2006 upto 5.00 PM
6.	Display of 1 st provisional admission list	:	20-07-2006
7.	Date for reporting in the college	:	29 & 31-07-2006
8.	Last date for receipt of upward assessment request	:	02-08-2006 upto 5.00 PM
9.	Display of 2 nd provisional admission list	:	04-08-2006
10.	Last date for reporting in the college	:	14-08-2006
11.	Last date for receipt of upward assessment request	:	17-08-2006 upto 5.00 PM
12.	Display of 3 rd provisional admission list	:	19-08-2006
13.	Last date for reporting in the college	:	31-08-2006

Note: No admission will be made after 3rd seat allotment even seats remain vacant.

If a candidate fails to get Admit Card for any reason, he/she should report to the Examination Centre (he/she has opted) one day before the Examination and contact Centre Incharge for seeking of duplicate Admit Card. He/She should bring alongwith him/her the following documents:

- (i) Proof of having submitted application (Postal Registration Receipt) in time
- (ii) Photocopies of the application form
- (iii) Photographs (3 copies) duly attested by the Principal of the school last attended

Candidates are advised to retain a photocopy of the application form for their personal record. It may be used any time in support of having submitted application and also retain a copy of the Registration Receipt of Post Office.

IMPORTANT

The following sheets duly completed in all respects are to be sent to the Co-ordinator JET/PRE PG, Maharana Pratap University of Agriculture & Technology, Rajasthan College of Agriculture, Udaipur on or before **25-05-2006, 5.00 P.M.** :

- i. Application form with photocopies of marksheets of 10th and 12th class and caste/PH certificate in case of reservation.
- ii. Admit Card for candidates
- iii. Duplicate Admit Card for centre
- iv. Two self addressed envelopes.

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- Note:**
1. All information related to the JET/PRE PG 2006 (Information Bulletin and Application Form, Notices/results/seat allotment) will be available on university website www.mpuat.ac.in
 2. Downloaded Application Form, Admit Card and Duplicate Admit Card duly filled by the candidate must be submitted along with demand draft of Rs. 500/- for General /OBC and Rs. 250/- for SC/ST/PH category payable in favour of Comptroller, MPUAT, Udaipur.