AMU MBBS BDS Entrance Test Syllabus Entrance Tips

Posted by Mohammad Shadaan Husain in: Entrance Tips Medical Entrance

The Aligarh Muslim University conducts the Medical Entrance Examination for Entrance to MBBS / BDS Courses. The Admission tests are conducted by the Faculty of Medicine to offer Admissions to MBBS and BDS Course in the Jawaharlal Nehru Medical College, Aligarh Muslim University.

The Entrance Examination is very tough and the Applicants must be well prepared to get through the test to gain Admission in the prestigious university.

The Medical Entrance Exam comprises of questions from the following subjects:

Botany

Zoology

Physics

Chemistry

The syllabus for Medical Entrance, admission to MBBS BDS is as follows:

The following Chapters & Topics must be well rehearsed.

The subject of Chemistry comprises of the following topics:

** Some Basic concepts of Chemistry:-

- 1. General Introduction: Importance and scope of chemistry
- 2.Nature of matter laws of chemical combination
- 3. Dalton's atomic theory: concept of elements, atoms and molecules.
- 4. Atomic and molecular masses
- 5. mole concept and molar mass
- 6. percentage composition

- 7. empirical and molecular formula
- 8. chemical reactions
- 9. stoichiometry and calculations based on stoichiometry.
- ** Structure of Atom:-
- 1. Discovery of Electron, Proton and Neutron
- 2. atomic number
- 3. isotopes and isobars
- 4. Thomson's model and its limitations
- 5. Rutherford's model and its limitations
- 6. Bohr's model and its limitations
- 7.concept of shells and subshells,
- 8.dual nature of matter and light
- 9. de Broglie's relationship
- 10. Heisenberg uncertainty principle
- 11. concept of orbitals,
- 12. quantum numbers
- 13.shapes of s, p and d orbitals
- 14.rules for filling electrons in orbitals Aufbau principle, Pauli's exclusion principle and

Hund's rule, electronic configuration of atoms, stability of half filled and completely filled orbitals.

** Classification of elements and periodicity in properties:-

1. Significance of classification

- 2. brief history of the development of periodic table
- 3. modern periodic
- law and the present form of periodic table
- 4. periodic trends in properties of elements -atomic
- radii, ionic radii
- 5. inert gas radii Ionization enthalpy
- 6. electron gain enthalpy
- 7. electronegativity,
- valency
- 8.Nomenclature of elements with atomic number greater than 100.
- ** Chemical bonding and molecular structure:-
- 1.Valence electrons
- 2. ionic bond, covalent bond
- 3. bond parameters
- 4. Lewis structure
- 5. polar character
- of covalent bond
- 6. covalent character of ionic bond
- 7. valence bond theory
- 8. resonance
- 9. geometry
- of covalent molecules
- 10. VSEPR theory
- 11. concept of hybridization, involving s,p and d orbitals and

shapes of some simple molecules, molecular orbital theory of homonuclear diatomic molecules

(qualitative idea only)

12. hydrogen bond.

- ** States of matter : Gases and liquids:-
- 1. Three states of matter
- 2. intermolecular interactions
- 3. types of bonding
- 4. melting and boiling points
- 5.role of gas laws in elucidating the concept of the molecule
- 6. Boyle's law, Charles law, Gay Lussac's
- law, Avogadro's law
- 7. ideal behaviour
- 8. empirical derivation of gas equation
- 9.Avogadro's number
- 10.ideal gas equation
- 11. Deviation from ideal behaviour
- 12. liquefaction of gases
- 13. critical temperature,
- kinetic energy and molecular speeds (elementary idea)

14.Liquid State- vapour pressure, viscosity and surface tension (qualitative idea only, no mathematical derivations)

** Thermodynamics:-

1. Concepts of System and types of systems

2. surroundings

3. work, heat, energy, extensive and

intensive properties, state functions.

4. First law of thermodynamics

-internal energy and enthalpy

- heat capacity and specific heat

-measurement of ΔU and ΔH

- Hess's law of constant heat summation

- enthalpy of bond

dissociation

- combustion

- formation

-atomization

- sublimation

- phase transition

- ionization

- solution

and dilution.

5.Second saw of Thermodynamics (brief introduction)

Introduction of entropy as a state function, Gibbs energy change for spontaneous and non -

spontaneous processes, criteria for equilibrium.

Third law of thermodynamics (brief introduction).

** Equilibrium:-

- 1.Equilibrium in physical and chemical processes
- 2. dynamic nature of equilibrium
- 3. law of mass
- action
- 4. equilibrium constant
- 5. factors affecting equilibrium Le Chatelier's principle

6. ionic equilibrium- ionization of acids and bases, strong and weak electrolytes, degree of ionization, ionization of

poly basic acids, acid strength, concept of pH, Henderson Equation, hydrolysis of salts

(elementary idea), buffer solution, solubility product, common ion effect (with illustrative examples).

- ** Redox reactions:-
- 1.Concept of oxidation and reduction
- 2. redox reactions
- 3. oxidation number
- 4. balancing redox reactions
- in terms of loss and gain of electrons and change in oxidation number
- 5. applications of redox
- reactions
- ** Solid State:-
- 1. Classification of solids based on different binding forces: molecular, ionic, covalent and metallic

solids, amorphous and crystalline solids (elementary idea).

- 2. Unit cell in two dimensional and three
- dimensional lattices

3. calculation of density of unit cell

4. packing in solids

5. packing efficiency

6.voids

7.number of atoms per unit cell in a cubic unit cell

8.point defects, electrical and magnetic properties.

9.Band theory of metals

10. conductors

11.semiconductors and insulators and n & p type semiconductors

** Solutions:-

1. Types of solutions

2.expression of concentration of solutions of solids in liquids

3. solubility of gases in liquids

4.solid solutions

5.colligative properties - relative lowering of vapour pressure

6. Raoult's law

7.elevation of boiling point

8.depression of freezing point

9.osmotic pressure

10.determination of molecular masses using colligative properties

11.abnormal molecular mass

12.van't Hoff factor.

** Electrochemistry:-

1.Redox reactions

- 2. conductance in electrolytic solutions
- 3.specific and molar conductivity
- 4. variations of conductivity with concentration
- 5.Kohlrausch's Law
- 6. electrolysis and law of electrolysis (elementary idea)
- 7.dry cell -electrolytic cells and Galvanic cells lead accumulator
- 8.EMF of a cell, standard electrode potential
- 9.Nernst equation and its application to chemical cells
- 10. Relation
- between Gibbs energy change and emf of a cell
- 11. fuel cells
- 12.corrosion.
- **Chemical Kinetics:-
- 1.Rate of a reaction (Average and instantaneous)
- 2.factors affecting rate of reaction: concentration,
- temperature, catalyst;
- 3.order and molecularity of a reaction
- 4.rate law and specific rate constant
- 5. integrated rate equations and half life (only for zero and first order reactions)
- 6.concept of collision
- theory (elementary idea, no mathematical treatment).
- 7. Activation energy
- 8. Arrhenious equation.

** Surface Chemistry:-

1. Adsorption - physisorption and chemisorption

2.factors affecting adsorption of gases on solids

3.catalysis

4. homogenous and heterogenous activity and selectivity

5. enzyme catalysis colloidal state

distinction between true solutions

6.colloids and suspension; lyophilic, lyophobic multimolecular

and macromolecular colloids; properties of colloids; Tyndall effect, Brownian movement,

electrophoresis

7. coagulation, emulsion - types of emulsions.

** Hydrogen:-

1. Position of hydrogen in periodic table

2. occurrence

3. isotopes

4.preparation

5. properties and uses of hydrogen hydrides-ionic covalent and interstitial; physical and chemical properties of water,

heavy water

6. hydrogen peroxide -preparation, reactions and structure and use; hydrogen as a

fuel.

15. General principles and process of isolation of elements

** Studies of s:-

1. Group 1 and Group 2 Elements

- -General introduction
- electronic configuration
- occurrence
- -anomalous properties of the first
- element of each group
- diagonal relationship
- trends in the variation of properties (such as ionization
- enthalpy, atomic and ionic radii)
- trends in chemical reactivity with oxygen, water, hydrogen and

halogens, uses.

-Preparation and Properties of Some Important Compounds:

Sodium carbonate, sodium chloride, sodium hydroxide and Sodium hydrogencarbonate,

biological importance of sodium and potassium.

-Calcium oxide and Calcium carbonate and their industrial uses, biological importance of maganesium and calcium.

** p-block elements:-

1.Group -15 Elements:

-General introduction

- electronic configuration

- occurrence

- oxidation states

- trends in physical and chemical properties

- nitrogen preparation properties & uses

-compounds of nitrogen

- preparation and properties of ammonia and nitric acid

-oxides of nitrogen

(Structure only)

- Phosphorus - allotropic forms, compounds of phosphorus: preparation and

-properties of phosphine, halides

- oxoacids (elementary idea only).

2.Group 16 Elements:

General introduction

-electronic configuration

-oxidation states,

-occurrence, trends in physical and chemical properties, dioxygen: Preparation, Properties and uses, classification of oxides, Ozone, Sulphur -allotropic forms; compounds of sulphur: Preparation properties and uses of sulphur-dioxide, sulphuric acid: industrial process of manufacture, properties and uses; Oxoacids of sulphur (Structures only).

3.Group 17 Elements:

General introduction

-electronic configuration- oxidation states

- occurrence, trends in physical and chemical properties; compounds of halogens, Preparation, properties and

uses of chlorine and hydrochloric acid, interhalogen compounds, oxoacids of halogens (structures

only).

4.Group 18 Elements:

General introduction

-electronic configuration

-occurrence

-trends in physical and chemical properties, uses.

**Studies of d & f - block elements:-

1.General introduction

2. electronic configuration

3. occurrence and characteristics of transition metals

4.general trends in properties of the first row transition metals - metallic character, ionization enthalpy,

oxidation states, ionic radii, colour, catalytic property, magnetic properties, interstitial compounds,

alloy formation, preparation and properties of K2

Cr

2

07

and KMnO4

Lanthanoids - Electronic configuration, oxidation states, chemical reactivity and lanthanoid

contraction and its consequences.

Actinoids - Electronic configuration, oxidation states and comparison with lanthanoids

****** Coordination compounds

** Organic chemistry : some basic principles and Tech niques

** Hydrocarbons

** Environmental Chemistry

** Haloalkanes and Haloarenes:-

1.Haloalkanes:

-Nomenclature

- nature of C -X bond

- physical and chemical properties

- mechanism of substitution reactions

- optical rotation.

2.Haloarenes:

-Nature of C -X bond

- substitution reactions (Directive influence of halogen in

monosubstituted compounds only).

3. Uses and environmental effects of - dichloromethane

-trichloromethane, tetrachloromethane,

iodoform, freons, DDT.

** Alchohals, phenols and Ethers:-

1.Alcohols:

- Nomenclature

- methods of preparation

- physical and chemical properties(of primary

alcohols only)

- identification of primary, secondary and tertiary alcohols
- mechanism of dehydration
- -uses with special reference to methanol and ethanol.

2.Phenols:

-Nomenclature

- methods of preparation
- physical and chemical properties
- acidic nature of phenol
- electrophillic substitution reactions

- uses of phenols.

3.Ethers:

-Nomenclature- methods of preparation

-physical and chemical properties

- uses.

** Aldehydes, Ketones and Carboxylic acids:-

- 1.Aldehydes and Ketones:
- -Nomenclature
- nature of carbonyl group
- methods of preparation

-physical and chemical properties

- mechanism of nucleophilic addition

- reactivity of alpha hydrogen
- in aldehydes: uses.
- 2.Carboxylic Acids:
- -Nomenclature
- acidic nature
- methods of preparation
- physical and chemical properties; uses.

** Organic compounds containing nitrogen:-

- 1.Amines: Nomenclature
- classification
- structure
- -methods of preparation
- physical and chemical properties
- uses
- identification of primary, secondary and tertiary amines.
- 2.Cyanides and Isocyanides will be mentioned at relevant places in text.
- 3. Diazonium salts:
- -Preparation
- chemical reactions and importance in synthetic organic chemistry
- ** Biomolecules:-
- 1.Carbohydrates Classification (aldoses and ketoses)
- monosaccahrides (glucose and fructose),
- -D-L configuration oligosaccharides (sucrose, lactose, maltose)

- polysaccharides (starch, cellulose,

glycogen)

- Importance of carbohydrates.

2.Proteins -Elementary idea of α - amino acids, peptide bond, polypeptides, proteins, structure of proteins - primary, secondary, tertiary structure and quaternary structures (qualitative idea only), denaturation of proteins; enzymes.

3. Hormones - Elementary idea excluding structure.

4. Vitamins - Classification and functions.

5.Nucleic Acids: DNA and RNA.

** Polymers:-

1.Classification -

-natural and synthetic

- methods of polymerization (addition and condensation)

copolymerization

2. some important polymers: natural and synthetic like polythene, nylon polyesters, bakelite, rubber

3.Biodegradable and non-biodegradable polymers.

** Chemistry in everyday life:-

1. Chemicals in medicines -

-analgesics

- tranquilizers antiseptics

-disinfectants

-antimicrobials

-antifertility drugs

-antibiotics

-antacids

-antihistamines.

2.Chemicals in food -

preservations

- artificial sweetening agents
- elementary idea of antioxidants.

3.Cleansing agents-

- -soaps and detergents
- cleansing action.

Topics to be covered in Physics

- **Physical World and Measurement:-
- 1.Physics scope and excitement
- 2. nature of physical laws; Physics, technology and society.
- 3.Need for measurement:
- Units of measurement
- systems of units
- SI units
- fundamental and derived

units.

-Length

- mass and time measurements
- accuracy and precision of measuring instruments
- errors in measurement
- -significant figures.
- 4. Dimensions of physical quantities, dimensional analysis and its applications.
- ** Kinematics:-
- 1.Frame of reference
- 2. Motion in a straight line: Position-time graph, speed and velocity.
- 3. Elementary concepts of differentiation and intergration for describing motion
- 4. Uniform and nonuniform motion
- 5. average speed and instantaneous velocity
- 6. Uniformly accelerated motion
- 7. velocitytime and position-time graphs.
- 8. Relations for uniformly accelerated motion (graphical treatment).
- 9.Scalar and vector quantities
- 10.Position and displacement vectors
- 11.general vectors and their
- notations
- 12. equality of vectors
- 13.multiplication of vectors by a real number; addition and subtraction
- of vectors. Relative velocity.
- 14. Unit vector; Resolution of a vector in a plane rectangular components
- 15. Scalar and Vector

product of vectors.

16.Motion in a plane. Cases of uniform velocity and uniform acceleration-projectile motion. Uniform circular motion.

**Laws of Motion:-

1.Intuitive concept of force- Inertia, Newton's first law of motion; momentum and Newton's second law of motion; impulse; Newton's third law of motion.

2.Law of conservation of linear momentum and its applications.

3.Equilibrium of concurrent forces. Static and kinetic friction, laws of friction, rolling friction,

lubrication.

4.Dynamics of uniform circular motion: Centripetal force, examples of circular motion (vehicle on

a level circular road, vehicle on banked road).

** Work, Energy and Power:-

1. Work done by a constant force and a variable force

2. kinetic energy

3. work-energy theorem

4.power.

5.Notion of potential energy

6. potential energy of a spring

7. conservative forces: conservation of

mechanical energy (kinetic and potential energies); non-conservative forces: motion in a vertical

circle; elastic and inelastic collisions in one and two dimensions

** Motion of System of Particles and Rigid Body:-

- 1.Centre of mass of a two-particle system
- 2. momentum conservation and centre of mass motion.
- 3.Centre of mass of a rigid body
- 4. centre of mass of a uniform rod.
- 5. Moment of a force
- 6. torque, angular momentum
- 7. laws of conservation of angular momentum and
- is applications.
- 8.Equilibrium of rigid bodies
- 9. rigid body rotation and equations of rotational motion
- 10. comparison
- of linear and rotational motions.
- 11. Moment of inertia
- 12. radius of gyration
- 13. Values of moments of inertia
- 14. for simple geometrical objects

(no derivation). Statement of parallel and perpendicular axes theorems and their applications.

** Gravitation:-

- 1.Keplar's laws of planetary motion
- 2. The universal law of gravitation.
- 3. Acceleration due to gravity and its variation with altitude and depth.
- 4. Gravitational potential energy and gravitational potential
- 5. Escape velocity. Orbital velocity of a

satellite

6. Geo-stationary satellites.

- ** Properties of Bulk Matter:-
- 1.Elastic behaviour
- 2. Stress-strain relationship
- 3. Hooke's law
- 4. Young's modulus
- 5. bulk modulus
- 6.shear
- modulus of rigidity
- 7. Poisson's ratio
- 8. elastic energy.
- 9. Pressure due to a fluid column
- 10. Pascal's law and its applications (hydraulic lift and hydraulic

brakes)

- 11. Effect of gravity on fluid pressure.
- 12. Viscosity, Stokes' law
- 13. terminal velocity
- 14. Reynold's number
- 15. streamline and turbulent flow
- 16. critical

velocity

- 17.Bernoulli's theorem and its applications.
- 18.Surface energy and surface tension
- 19. angle of contact

20. excess of pressure accros a curved surface

21.application of surface tension ideas to drops

22. bubbles and capillary rise.

23.Heat, temperature

24. Thermal expansion; thermal expansion of solids, liquids and gases, anomalous

expansion of water; specific heat capacity; Cp, Cv - calorimetry; change of state - latent heat

capacity.

25. Heat transfer-conduction, convection and radiation, thermal conductivity, Newton's law of cooling,

Qualitative ideas of Blackbody radiation , Wein's displacement Law, Stefan's law Green house

effect.

** Thermodynamics:-

1. Thermal equilibrium and definition of temperature (zeroth law of thermodynamics)

2.Heat, work

and internal energy

3. First law of thermodynamics. Isothermal and adiabatic processes.

4. Second law of thermodynamics: reversible and irreversible processes. Heat engine and refrigerator.

** Behaviour of Perfect Gas and Kinetics Theory of Gases:-

1.Equation of state of a perfect gas

- 2. work done in compressing a gas.
- 3. Kinetic theory of gases assumptions, concept of pressure
- 4. Kinetic interpretation of temperature
- 5.rms speed of gas molecules
- 6. degrees of freedom

7. law of equipartition of energy (statement only)

and application to specific heat capacities of gases; concept of mean free path, Avogadro's number.

** Oscillations and Waves:-

1.Periodic motion - time period, frequency, displacement as a function of time.

- Periodic functions.

-Simple harmonic motion (S.H.M) and its equation; phase; oscillations of a spring-restoring

force and force constant; energy in S.H.M. Kinetic and potential energies; simple pendulum-

derivation of expression for its time period.

2. Free, forced and damped oscillations (qualitative ideas only), resonance.

3. Wave motion. Transverse and longitudinal waves

-speed of wave motion

- Displacement relation
- for a progressive wave
- 4. Principle of superposition of waves

- reflection of waves

- standing waves

in strings and organ pipes, fundamental mode and harmonics, Beats, Doppler effect.

** Electrostatics

- ****** Current Electricity
- ** Magnetic Effect of Current and Magentism
- ** Electromagnetic Induction and Alternating Current
- ** Electromagnetic Waves

- ** Optics
- ** Dual Nature of Matter and Radiation
- ** Atoms and Nuclei
- ** Electronic Devices
- ** Communication System

BIOLOGY (Botany and Zoology)

I – Botany

** BIOLOGICAL CLASSIFICATION (5 Kingdom System / Classification)

CLASSIFICATION OF ANGIOSPERMS UPTO SUBCLASS LEVEL

**BOTANICAL GARDENS AND HERBARIA:-

** KINGDOM : MONERA (Archaebacteria & Eubacteria)

** KINGDOM : FUNGI Phycomycetes, Ascomycetes, Basidiomycetes, Deuteromycetes

** KINGDOM : PLANTAE Algae

- Bryophyta
- Pteridophyta
- Gymnosperms and Angiosperms

****** VIRUSES, VIROIDS & LICHENS

STRUCTURAL ORGANIZATION IN PLANTS

** Morphology of flowering plants

Root, Stem, Leaf and their modifications, Inflorescence, Flower, Fruit and Seed

** Description of following plant families:-

a) Fabaceae b) Solanaceae c) Liliaceae

****ANATOMY OF FLOWERING PLANTS:-**

- ** Tissues; Meristematic and Permanent
- Simple and Complex Tissue System. Anatomy of root
- -stem & Leaf (monocot & dicot)
- Secondary growth in stem & root.

CELL : STRUCTURE AND FUNCTION

** Cell Wall, Cell membrane and cell organelles, Plastids, Mitochondria, Endosplasmic, reticulum, Golgi Bodies, Ribosomes, Lysosomes, Vacuoles, Centrioles, Nuclear, Organisation and Microbodies.

** CELL DIVISION : Cell Cycle, Mitosis and Meiosis, Plant Physiology

- ** TRANSPORT IN PLANTS:-
- ** MINERAL NUTRITION:-
- ** PHOTOSYNTHESIS IN HIGHER PLANTS:-
- RESPIRATION IN PLANTS
- PLANT GROWTH AND DEVELOPMENT
- ****PLANT REPRODUCTION:-**
- Reproduction in Organisms
- Reproduction in Flowering, pollination and fertilization Plants
- Development of seeds and fruits.
- MENDEILIAN INHERITANCE
- CHROMOSOMAL BASIS OF INHERITANCE

- Deviations from Mendelian ratio (gene interaction, incomplete dominance, complimentary genes, multiple alleles.

**MOLECULAR BASIS OF INHERITANCE:-

- DNA Structure,
- Replication, transcription, translation.
- Regulations of Gene Expression.
- Plant breeding
- Plant Tissue Culture
- Food Production
- Microbes in household food processing
- industrial production
- Sewage treatment and energy generation.

****BIOTECHNOLOGY AND ITS APPLICATIONS**

- Recombinant DNA technology - Applications in agriculture and industry

- Genetically modified organisms - Insulin and Bt. Cotton.

**ECOLOGY AND ENVIRONMENT:-

- -- Ecosystem Components Types and energy flow
- -- Ecological adaptations in plants
- -- Environmental issues.

II - Zoology

- ** Diversity in living organism
- **Classification of living organisms (Kingdom Animalia and Protista).
- ** Systematics and binomial system of nomenclature.
- ** Zoological Parks and meuseums
- **Tissues in animals

** Morphology, anatomy and functions of different systems of an amnelia earthworm), an insect (cockroach) and an amphibian (frog)

**Biomolecules of cell

** Enzymes

- **Digestion and absorption.
- **Breathing and Respiration
- ** Body fluids and circulation
- ** Excretory products and elimination.
- ** Locomotion and movement
- ** Control and Coordination

** Human Reproduction - Reproductive health, birth control, Contraception and sexually transmitted disease.

** Human genetics - Sex determination in human being Linkage and crossing over. Inheritance pattern of haemophilia and blood groups in human beings, Genome and human genome project.

** DNA fingerprinting, Evolution (Theories Evidences)

** Zoology in human welfare Animal husbandary concepts of immunology, vaccine Pathogens Parasites Cancer and Aids.

- ** Adolescance and drug alocohol abuse.
- ** Applications of biotechnology Recombinant DNA technology and its application in health.
- ** Species, population, community
- ** Animal ecological adaptation
- ** Wildlife Conservation

The above topics constitute the syllabus for the AMU Medical Entrance Examination. We shall soon post on various other Entrance related help like How to Study, Exam Tips, Time Management, Important Questions, etc.

Keep checking the site for regular updates. Hope the above information was helpful.

The Application forms will be available in March, by then keep studying and prepare for the test. If you have any queries, feel free to ask us