Waljat College of Applied Sciences, Muscat

Guidelines for applicants appearing in Entrance Examination for admission to Foundation, Bachelor Degree and Master Degree Programs

1) **Medium of Examination: The medium of examination is English Only.**

2) **Mode of Examination:**

Foundation:

Eligible candidates can take admission to admission to foundation Level -1 of a given program directly.

Candidates seeking admission to Level – 2 and Level – 3 of a given program has to appear the entrance examination.

The subject for entrance examination is English only.

UG Programs:

The entrance examination comprises of a written examination (for English), Computer based multiple choice examination (for Physics, Chemistry & Mathematics / Information practices) followed by a personal interview.

The type of questions, number of questions and duration is as per the details given below:

Subjects	Type of questions	No. of questions	Duration
English Language	English Communication (reading, writing, grammar and vocabulary)		45 Minutes
Physics, Chemistry and Mathematics / Information practices	Multiple choice questions	20 in each subject	30 Minutes for each subject

The subjects of entrance examination for various programs are as per the details given below:

Sl. No.	Course	Subjects
1	BE ✓ Biotechnology, ✓ Computer Science, ✓ Electronics & Communication, ✓ Chemical	English, Physics, Chemistry, Mathematics
2	BCA	English, Mathematics/ Information practice
3	BBA	English, Elementary Mathematics

PG Programs:

Candidate has to appear test for the subjects as per the details given below:

Sl. No.	Course	Subjects
1	EMBA	English and Numerical Aptitude test
2	MBA	English and Numerical Aptitude test

3) Schedule:

Foundation and UG Programs:

Entrance examination for admission to Foundation Level – 2 and Level – 3 and bachelor degree programs in Monsoon-2016 session are scheduled as per the details given below:

Date	Time
During April 16, 2017 - August 31, 2017 (All working days)	**10.30 AM**

PG Programs

Date	Time
Entrance Examination Followed by Interview (All working days)	**10.30 AM**

4) Further Information:

a. The entrance examination will be conducted at Waljat College of Applied Sciences only.
b. The candidate has to report at the Admission & Registration Department 45 minutes before the commencement of the entrance examination.
c. Entrance test is meant to assess the candidates suitable for the program to which he /she seeking admission.
d. Question paper for entrance examinations (Physics, Chemistry and Mathematics) will consists of objective type multiple choice questions only (four options with single correct answer).
e. Candidates should refer to syllabi for entrance examination provided on website.
f. Entrance examination will be conducted in Block III.
g. No negative marking.
h. No candidate will be allowed to enter the examination Hall 15 minutes after the commencement of the examination.
i. No candidate will be allowed to leave the examination Hall after 15 minutes of commencement of exam.

j. Use Blue OR Black ink only for writing answers.

k. The examinees shall not open the test Booklet until asked to do so by the invigilator.

l. The examination will start exactly at the appointed time. The invigilator will make an announcement to this effect. The examinees should start writing only after the announcement of the invigilator.

m. The Applicant has to appear for an interview after the Written / Computer based examination.

n. The Applicant will be informed about the result of entrance examination within one working day.

Syllabi UG Programs

PHYSICS

LAWS OF MOTION: Force and Inertia, Newton's First law of motion; Momentum, Newton's Second Law of motion; Impulse; Newton's Third Law of motion. Law of conservation of linear momentum and its applications, Equilibrium of concurrent forces. Static and Kinetic friction, laws of friction, rolling friction.

ROTATIONAL MOTION: Basic concepts of rotational motion; torque; angular momentum, moment of inertia. Dynamics of uniform circular motion: Centripetal force and its applications.

GRAVITATION: The universal law of gravitation, Acceleration due to gravity and its variation with altitude and depth. Kepler's laws of planetary motion. Gravitational potential energy; Gravitational potential, Escape velocity.

THERMODYNAMICS: Thermal equilibrium, Zeroth law of thermodynamics, Concept of temperature. Heat, work and internal energy. First law of thermodynamics, Second law of thermodynamics.

KINETIC THEORY OF GASES: Equation of state of a perfect gas, Work done on compressing a gas. Kinetic theory of gases – assumptions, concept of pressure. Kinetic energy and temperature: RMS speed of gas molecules; Degrees of freedom, Law of equipartition of energy, mean free path, Avogadro's number.

ELECTRICITY: Conductors and insulators, Ohm's law, resistors in series and parallel, Dielectrics and electric polarization, capacitor, combination of capacitors in series and parallel.

ELECTROMAGNETIC INDUCTION: Electromagnetic induction; Faraday's law, induced e.m.f. and current; Lenz's Law, Eddy currents. Self and mutual inductance. combination of inductors in series and parallel.

OPTICS: Reflection and refraction of light at plane and spherical surfaces, mirror formula, Total internal reflection and its applications, Deviation and Dispersion of light by a prism, Lens Formula, Magnification, Power of a lens, Combination of thin lenses in contact, Microscope and Astronomical Telescope (reflecting and refracting) and their magnifying powers.

ELECTRONIC DEVICES: Semiconductors; semiconductor diode: I-V characteristics in forward and reverse bias; diode as a rectifier; I –V characteristics of LED, photodiode, solar cell and Zener diode; Zener diode as a voltage regulator. Logic gates (OR, AND, NOT, NAND and NOR).

CHEMISTRY

SOME BASIC CONCEPTS IN CHEMISTRY: Matter and its nature, Dalton's atomic theory, Concept of atom, Molecule, element and compound; Physical quantities and their measurements in Chemistry, precision and accuracy, significant figures, S.I. Units, dimensional analysis' Laws of

chemical combination; Atomic and Molecular masses, mole concept, molar mass, percentage composition, empirical and molecular formulae; Chemical equations and stoichiometry.

STATES OF MATTER:

Gaseous State – Measurable properties of gases; Gas laws- Boyle's law, Charle's law, Graham's law of diffusion, Avogadro's law, Dalton's law of partial pressure; concept of Absolute scale of temperature; Ideal gas equation; Kinetic theory of gases (only postulates); Concept of average, root mean square and most probable velocities; Real gases, deviation from Ideal behavior, compressibility factor and van der Waals equation.

Liquid State – Properties of liquid – vapour pressure, viscosity and surface tension and effect of temperature on them (qualitative treatment only).

Solid State – Classification of solids: molecular, ionic, covalent and metallic solids, amorphous and crystalline solids (elementary idea); Bragg's Law and its applications; Unit cell and lattices, Packing in solids (fcc, bcc and hcp lattices), voids, calculations involving unit cell parameters, imperfection in solids; Electrical and magnetic properties.

CHEMICAL BONDING AND MOLECULAR STRUCTURE:

Ionic Bonding- Formation of ionic bonds factors affecting the formation of ionic bonds; calculation of lattice enthalpy.

Covalent Bonding – Concept of electronegativity, Fajan's rule, dipole moment; valence shell Electron Pair Repulsion (VSEPR) theory and shapes of simple molecules.

MATHEMATICS

Algebra: Expressions, Equations, Linear inequalities, Algebraic solutions of linear inequalities in one variable and their representation on the number line. Graphical solution of linear inequalities in two variables. Solution of system of linear inequalities in two variables graphically. Properties of different types of functions, Matrices, Properties of Matrices, Determinants, Properties of Determinants. Brief description of algebraic properties of complex numbers. Argand plane and polar representation of complex numbers.

Trigonometric Functions: Positive and negative angles. Measuring angles in radians and in degrees and conversion from one measure to another. Definition of trigonometric functions. Addition and subtraction formulae, Multiple and sub multiple angles, Sum as product.

Limits and Continuity: Limits, Indeterminate forms, Right hand and left hand limit, Continuity of a function at a point, Continuity of a function in an interval.

Calculus and Its Applications:
Differentiation: derivative of composite functions, chain rule, derivative of inverse trigonometric functions, derivative of implicit function. Concept of exponential and logarithmic functions and their derivative. Logarithmic differentiation. Derivative of functions expressed in parametric forms. Second order derivatives.

Applications of Derivative: rate of change, increasing / decreasing functions, tangents and normals, approximation, maxima and minima.

Integration: Integration of a variety of functions by substitution, by partial fractions and by parts. Basic properties of definite integrals and evaluation of definite integrals.

Applications of the Integrals: Area under simple curves, especially lines, areas of circles /parabolas / ellipse (in standard form only), area between the two curves.

Geometry: Coordinate Lines, parabolas, circles, equation of a circle, ellipses, hyperbolas.

Probability and Statistics: Mean, median, mode, range, standard deviation, graphs and plots, least squares regression (linear), Multiplication theorem on probability, Conditional probability, independent events, total probability, Baye's theorem, Random Variable and its probability distribution. Repeated independent (Bernoulli) trials and Binomial distribution.

INFORMATION PRACTICE

UNIT 1: NETWORKING AND OPEN STANDARDS

Computer Networking:

- Networking: a brief overview.
- Communication Media: Wired Technologies - Co-Axial, Ethernet Cable, Optical Fiber, Wireless Technologies - Blue Tooth, Infrared, Microwave, Radio Link, Satelite Link.
- Network Devices : Hub, Switch, Repeater, Gateway and their functions
- Types of Network: LAN, MAN, WAN, PAN
- Network Topologies: Star, Bus, Tree
- Network Protocols: HTTP, TCP/IP, PPP
- Identifying computers and users over a network: Basic concept of domain name, MAC (Media Access Control), and IP Address, domain name resolution.
- Networking Security: denial of service, intrusion problems, snooping.

Open Source Concepts:

- Open Source Software (OSS), comon FOSS/FLOSS examples (e.g. Gnu/Linux, Firefox, OpenOffice, Java, netbeans, MySQL), common open standards (WWW, HTML, XML, ODF, IP, TCP).
- Indian Language Computing: Character encoding, UNICODE, different types of fonts (open type vs true type, static vs dynamic), Entering Indian Language Text - Phonetic and key map based.

UNIT 2: PROGRAMMING

Programming Fundamentals

- Basic concept of Access specifier for classes, Members and methods
- Basic concept of Inheritance.
- Commonly used libraries: String class and methods: toString(), concat(), length(), toLower Case(), toUpper Case(), trim(), substring()Math class methods: pow(), round()
- Accessing MySQL database using ODBC/JDBC to connect with database.
- Web application development: URL, Web Server, Communicating with the web server, concept of Client and Server Side.
- HTML based web pages covering basic tags - HTML, TITLE, BODY, H1..H6, Paragraph (P), Line Break (BR), Section Separator (HR), FONT, TABLE, LIST (UL, OL), FORM;

- Creating and accessing static pages using HTML and introduction to XML

UNIT 3: RELATIONAL DATABASE MANAGEMENT SYSTEM

Database Fundamentals

- Concept of Database Transaction, Committing and revoking a Transaction using COMMIT and REVOKE,
- Grouping Records: GROUP BY, Group functions - MAX(), MIN(), AVG(), SUM(), COUNT(); using COUNT(*), DISTINCT clause with COUNT, Group Functions and Null Values,
- Displaying Data From Multiple Tables: Cartesian product, Union, concept of Foreign Key, Equi- Join
- Creating a Table with PRIMARY KEY and NOT NULL constraints, Viewing Constraints, Viewing the Columns Associated with Constraints using DESC Command;
- ALTER TABLE for deleting a column, ALTER TABLE for modifying data types of a column
- For adding a constraint enabling constraints, dropping constraints.
- DROP Table for deleting a table;

UNIT 4: IT APPLICATIONS

- Front-end Interface - Introduction; content and features; identifying and using appropriate component (Text Box, Radio Button, CheckBox, List etc) for data entry, validation and display;
- Back-end Database - Introduction and its purpose; exploring the requirement of tables and its essential attributes;
- Front-End and Database Connectivity - Introduction, requirement and benefits
- Demonstration and development of appropriate Front-end interface and Back-end Database for e- Governance, e-Business and e-Learning applications
- Impact of ICT on Society: Social and Economics benefits and Infomania.

UNIT 5: JAVA GUI PROGRAMMING

- Rapid Application Development, Java GUI Toolkit, Java Data types, Variables, Text Interaction in Java GUIs, Operators, Expressions, Statements
- Programming Constructs
- Understanding Swing Components, Frame, Push Buttons, Labels, Textfields, Password Fields, Text area, Checkboxes, Radiobuttons, Lists, Comboboxes

- Classes and Objects, Methods, Scope, Constructors, Object Oriented Terminology, Libraries, Access Specifiers, Working with Strings, Packages

- Inheritance, Types of inheritance, Function Overloading, Interfaces, Abstact Class, GUI Dialogs and Tables, Database Connectivity to MySQL

- Java Swing Control Methods & Properties

Business Mathematics

Syllabus

Module 1:- Basic Algebra

Module 2:- Real numbers

Module 3:- Ratio, Proportion & Percentage

Module 4:- Profit & Loss

Module 5:- Interest (Simple & Compound)

Module 6:- Linear Equations

Module 7:- Elementary Statistics, Permutation & Combination, Probability

ENGLISH

English Language (IELTS Pattern):

1. Reading
2. Comprehension
3. Vocabulary
4. Grammar Writing (Paragraph/Essay)

PG Programs

English:

English Language (IELTS Pattern):

1. Reading
2. Comprehension
3. Vocabulary
4. Grammar Writing (Paragraph/Essay)

Numerical Aptitude and Reasoning:

Similar to GMAT pattern.