AMCAT Modules and Syllabus

AMCAT tests students from different fields in various domains with the help of an in-depth micro analysis in each domain.

The test consists of various sections/modules which you can choose according to your profile or education background. There are certain modules which are compulsory for everyone (*Language and Aptitude Modules*), whereas others are optional. **During the test, you will be given an option to select any two domain specific modules. It is recommended to that you go through the module description and befitting job profiles before you go to take the AMCAT.** Your choice of modules increases your visibility for particular kind of jobs, for instance, if you take the Programming Module, you will be visible to more IT companies whereas taking a HR module will help you find HR profiles. It is best for you to go through the module list now and decide which optional modules you would like to take.

Provided below is the list of all the modules that you can take in AMCAT, the broad topics that a module would cover, relevant job profiles, number of questions, duration and some sample questions for each module.

Contents

ENGLISH COMPREHENSION (Verbal Reasoning)

The module evaluates written English skills and is aimed at determining the candidate"s ability to understand (a) the written text (b) the spoken word and (c) the ability to communicate effectively through written documents.

Befitting Job Functions/Profiles: This module will be relevant for almost all profiles such as Business Consulting, HR/Admin, iTeS/BPO, Marketing, Engineering, Sales and Customer Management, IT, Hotel Management, Life Sciences, Content Development, etc.

Number of Questions: 18

Module Duration: 18 min

Detailed Syllabus:

Vocabulary

- Synonyms
- Antonyms

Grammar

- Subject-Verb Agreement
- Tenses and Articles
- Prepositions and Conjunctions
- Speech and Voices

Comprehension

- Inferential and Literal Comprehension
- Contextual Vocabulary
- Comprehension ordering

LOGICAL REASONING

The module assesses capacity of an individual to interpret things objectively, to be able to perceive and interpret trends to make generalizations and be able to analyze assumptions behind an argument/statement.

Befitting Job Functions/Profiles: This module will be relevant for almost all profiles such as

Content Development, Business Consulting, HR/Admin, iTeS/BPO, Marketing, Engineering, Sales and Customer Management, IT, Hotel Management, Life Sciences, etc.

Number of Questions: 12

Module Duration: 20 min

Detailed Syllabus:

Deductive Reasoning

- Coding deductive logic
- Directional sense, Blood relations
- Objective Reasoning
- Selection decision tables
- Puzzles

Inductive reasoning

- Coding pattern and Number series pattern recognition
- Analogy and Classification pattern recognition

Abductive Reasoning

- Logical word sequence
- Data sufficiency

QUANTITATIVE ABILITY

The module is ideal to evaluate the numerical ability of an individual and is available in both technical and non technicalflavor.

Befitting Job Functions/Profiles: This module will be relevant for almost all profiles such as Content Development, Business Consulting, HR/Admin, iTeS/BPO, Marketing, Engineering, Sales and Customer Management, IT, Hotel Management, Life Sciences, etc.

Number of Questions: 16

Module Duration: 25 min

Detailed Syllabus:

Basic Mathematics

- Divisibility
- HCF and LCM
- Numbers, decimal fractions and power

Applied Mathematics

- Profit and Loss
- Simple and Compound Interest
- Time, Speed and Distance

Engineering Mathematics

- Logarithms

- Permutation and Combinations
- Probability

COMPUTER PROGRAMMING:

The module is ideal to evaluate entry level talents exposure and expertise in Computer Programming. This module is agnostic to programming languages and does not require the candidates to code during the test.

Befitting Job Functions/Profiles: Technical Support Executive, Computer Engineer, Software Developer Web, System s/w, Product, Trainee, Testing Engineer, Research Engineer, Content Developer-IT, IT Recruiter, etc.

Number of Questions: 25

Module Duration: 35 min

Detailed Syllabus:

Basic Programming

- Data Types
- Iteration, Recursion, Decision
- Procedure, functions and scope

Data Structures

- Arrays, Linked Lists, Trees, Graphs
- Stacks, Queues
- Hash Tables
- Heaps

OOPs

- Polymorphism
- Abstraction
- Encapsulation

Miscellaneous

- Searching and Sorting
- Complexity Theory

AUTOMATA FIX (DEBUGGING)

7 Questions – 20 Mins Duration

In this module, the candidate has to fix logical/syntax error of the code or complete the given code by reusing existing functions.

Befitting Job Functions/Profiles: Full Stack Developer, Game Developer, Game Programmer, Mobile App Developer, Embedded Software Engineer, Software Architect, Software Developer, Computer and Information Research Scientist, Back End Developer, Software Quality Assurance Engineer.

Detailed Syllabus:

- Basic programming
- Control Structures
- conditional statements
- Linear data structures
- Advanced data structures
- Sorting and searching algorithms

Question Type	Description
Logical	The candidate is required to fix all logical errors in the given code. This checks the various logical concepts like conditions, looping etc
Compilation	Candidate needs to correct the syntax of the given code without changing its logic. This checks the candidate basic knowledge of syntax and language specific concepts.
Code reuse	Candidate needs to complete the given code by reusing existing functions. This is a bit tougher than the logical and compilation based questions. The candidate is required to complete the code using the predefined structure or functions.

AUTOMATA:

2 Questions – 45 Mins duration

Data Structure Concepts	
Array and Matrices	1D array
	Array Rotations
	Arrangement and rearrangement of elements of array
	Properties of matrices
	Inverting matrices
	Transpose of the matrix
Linked list	Basic operations on linked list
	Circular linked list
String processing and manipulation	Basic string operations
	Pattern searching
Stack/Queue	Basic stack operations

	Basic queue operations
Sorting and Searching	linear and binary search
	various sorting concepts
Advanced Design and Analysis Techniques	
Greedy Algorithms	activity-selection problem
	fractional knapsack
Minimum Spanning Trees	Kruskal
	Prim
String Matching	The naive string-matching algorithm
Divide and Conquer	Sorting algorithms
	Binary Search
Computational Geometry	Line-segment properties
	Intersection of line segment

ELECTRONICS AND SEMI-CONDUCTORS ENGINEERING

The module assesses the job suitability of the candidate in those companies which deal with Embedded Systems, VLSI design, SOC, Electronic, Design and Automation Companies etc.

Befitting Job Functions/Profiles: Electronics Engineer, Hardware Engineer, Sales and Operations Manager/Executive for Electronic Industry Processes, Research Scientist, Technical Content Developer, etc.

Number of Questions: 25

Module Duration: 35 min

Detailed Syllabus:

Semiconductors and Devices

Basics of semiconductor
Two terminal devices
Three terminal devices

Analog Electronics

Basic for circuit analysis
Small Signal and Large Signal Circuit Analysis
Feedback, stability and oscillators
Op-amps

Filters

Digital Electronics

Boolean Algebra and minimization of Boolean functions
Logic families
Combinational Circuits
VLSI Basics

ELECTRICAL ENGINEERING

The module focuses on testing a student on theoretical knowledge as well as practical concepts of electricity, electronics and electromagnetism.

Befitting Job Functions/Profiles: Electrical Engineer, Power Engineer, Technical Content Developer, Sales and Operations Manager/Executive for Electrical Industry Processes, Research and Development, etc.

Number of Questions: 30

Module Duration: 30 min

Detailed Syllabus:

Fundamentals of Electrical Engineering

Basic electrical engineering
Electrical machines
Power machines

Instrumentation and control

Instruments and measurements
Control system

Electronics

Analog and digital electronics
Power electronics

MECHANICAL ENGINEERING

The module assesses a student's skills, knowledge and understanding of the core principles/concepts in the branch of mechanical engineering.

Befitting Job Functions/Profiles: Mechanical Engineer, Research and Development, Automation Engineer, Product Engineer, Technical Content Developer, Sales and Operations

in industry processes, etc.

Number of Questions: 30

Module Duration: 25 min

Detailed Syllabus:

Manufacturing Science

- Engineering materials
- Production engineering
- CAD/CAM
- Industrial engineering

Thermodynamics and IC Engines

- Thermodynamic cycles and steam generators
- IC engines
- Heat transfer, refrigeration and air conditioning

Fluid and Machine Mechanics

- Fluid mechanics and fluid machinery
- Strength of materials
- Theory of machines
- Machine design

METALLURGICAL ENGINEERING

The module focuses on testing a student on theoretical knowledge as well as practical concepts in the branch of metallurgical engineering.

Befitting Job Functions/Profiles: Process Metallurgists, Design Engineer, Metallurgical R&D Lab Technician, Welding Engineer, Quality Planning Engineer, Plant Equipment Engineer and Ballistics Engineer.

Number of Questions: 25

Module Duration: 18 min

Detailed Syllabus:

Process Metallurgy

- Fuels and furnaces mineral beneficiation
- Non Ferrous Technology - Iron and steel
- Metallurgical thermodynamics

Industrial Metallurgy

Metal casting, joining and forming
Corrosion science

Physical Metallurgy

Non ferrous materials
Phase transformation and heat treatment
Material testing and characterization

AUTOMOTIVE ENGINEERING:

The module focuses on testing a student on theoretical knowledge as well as practical concepts of automobile design and testing, experimental/scientific methods related to automotive engineering.

Befitting Job Functions/Profiles: Aerospace Engineer, Marine Engineer, Design Engineer, Research and Development Engineer, Sales Engineer, Technical Content Developer, etc.

Number of Questions: 24

Module Duration: 16 min

Detailed Syllabus:

Auto Engine

Engine classification
Engine fuel system
Cooling and lubrication

Auto vehicle technology and Electrical

Frame, body, clutch and brake
Axle and steering system
Transmission, differential, propeller shaft

Auto Maintenance and Turn Up

Preventive maintenance
Troubles and tuning
Auto-inspection and tuning

INSTRUMENTATION ENGINEERING

The module focuses on testing a student on theoretical knowledge as well as practical concepts in the branch of instrumentation engineering.

Befitting Job Functions/Profiles: Instrumentation Engineer, Automation Engineer, Research Scientist, Design Engineer, Plant Engineer, Process Engineer, Maintenance Engineer, etc.

Number of Questions: 25

Module Duration: 20 min

Detailed Syllabus:

Instrumentation and Control

- Transducers and industrial instrumentation
- Analytical and optical instrumentation
- Electronic instrumentation and measurements
- Control systems and process control

Electronics

- Analog electronics
- Digital electronics
- Microprocessor and microcontroller

Signals and Communication System

- Signal and systems
- Communications
- Fundamentals of network analysis and synthesis

PRODUCTION ENGINEERING:

The module focuses on testing a student on theoretical and practical concepts of design, development and implementation of new production processes, information and control systems, computer controlled inspection, assembly and handling.

Befitting Job Functions/Profiles: Process Engineer, Project Design Engineer, Quality Control Engineer, Service Engineer, Maintenance Engineer, etc.

Number of Questions: 20

Module Duration: 15 min

Detailed Syllabus:

Production Technology and Analysis

- Metal casting, forming and joining
- Manufacturing Analysis

Metal Cutting and Tool Design

- Machining and machine tool operators
- Tool engineering
- Metrology and inspection

Material Science and CIM

- Polymers and composites
- Computer integrated manufacturing

CIVIL ENGINEERING:

The module focuses on testing a student on general principles of mechanics and construction, and requires the candidates to apply these principles in practical based problems.

Befitting Job Functions/Profiles: Civil Engineer, Research Associate, Site Engineer, Design Engineer, Structural Engineer, Sales and Operations Manager/Executive - Industrial Processes, Technical Content Developer, etc.

Number of Questions: 25

Module Duration: 20 min

Detailed Syllabus:

Structural Engineering

- Applied mechanics
- Strength of materials
- Building materials and construction
- Theory of structures
- Steel structures
- Concrete technology
- R.C.C. Design

Geotechnical and Water Resources Engineering

- Soil mechanics
- Hydraulic engineering
- Water supply engineering

Transportation Engineering and Surveying

- Highways engineering

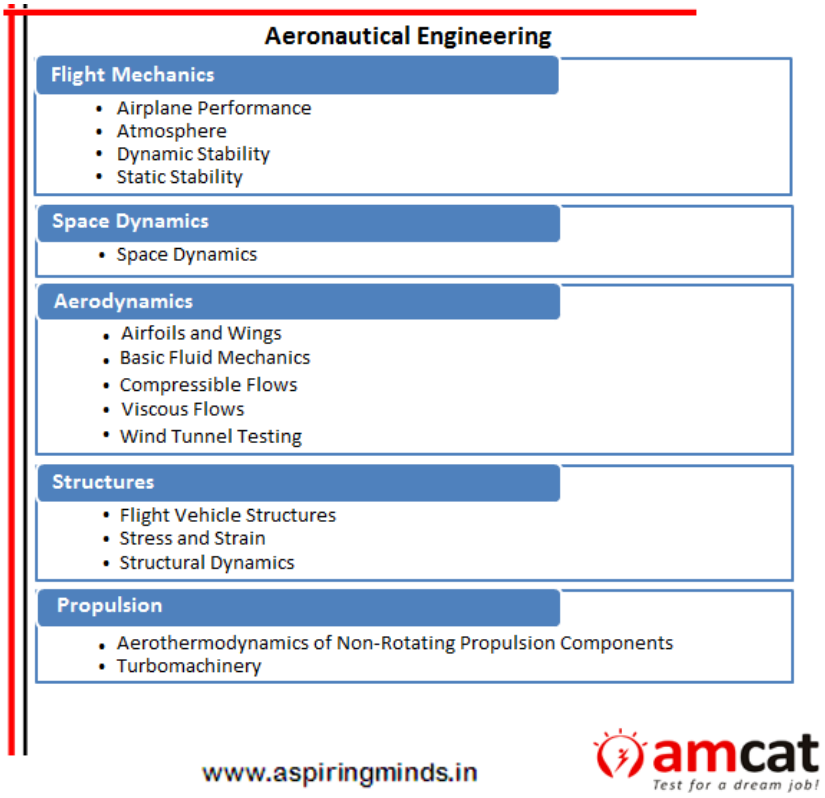
Railway engineering
Estimation and costing
Surveying

Aeronautical Engineering:

Number of Questions: 25

Module Duration: 25 min

Detailed Syllabus:

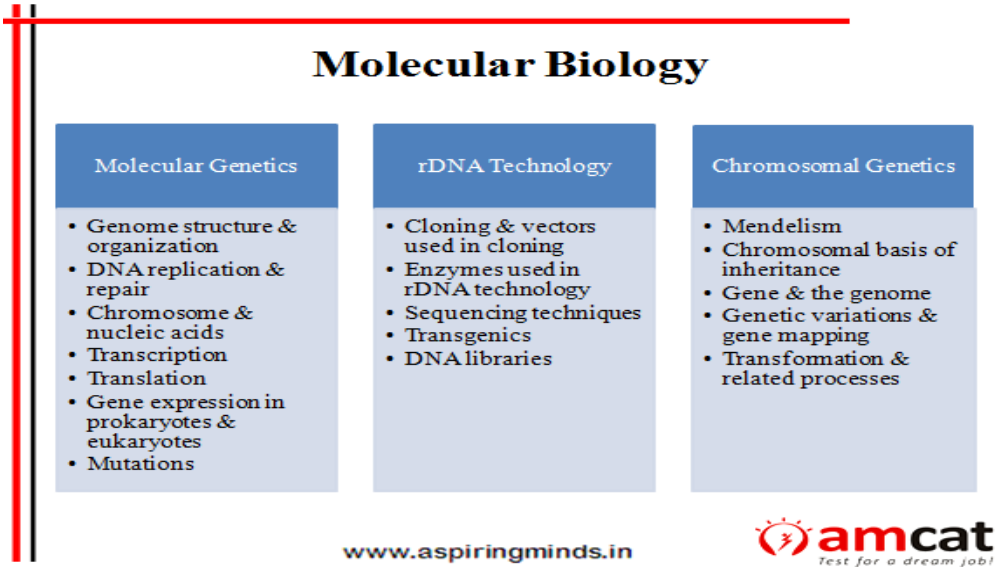


Molecular Biology:

Number of Questions: 20

Module Duration: 15 min

Detailed Syllabus:

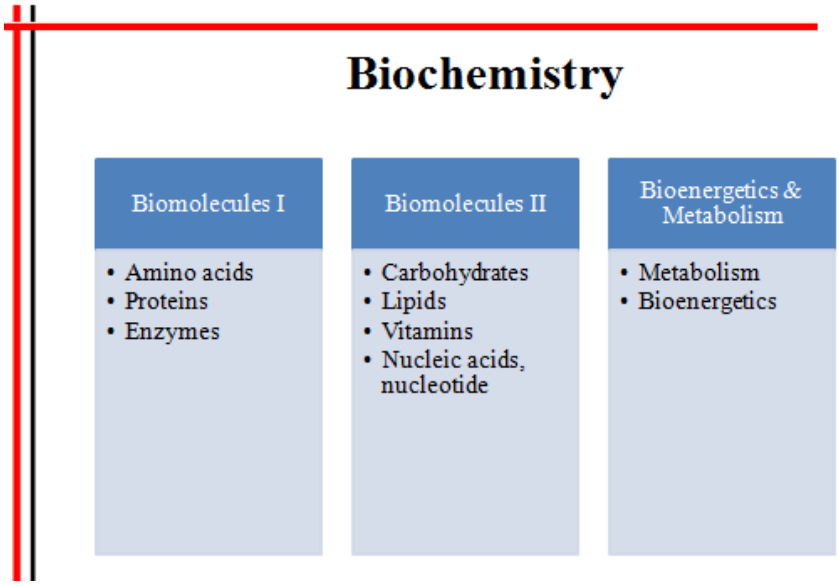


Bio-Chemistry:

Number of Questions: 12

Module Duration: 10 min

Detailed Syllabus:

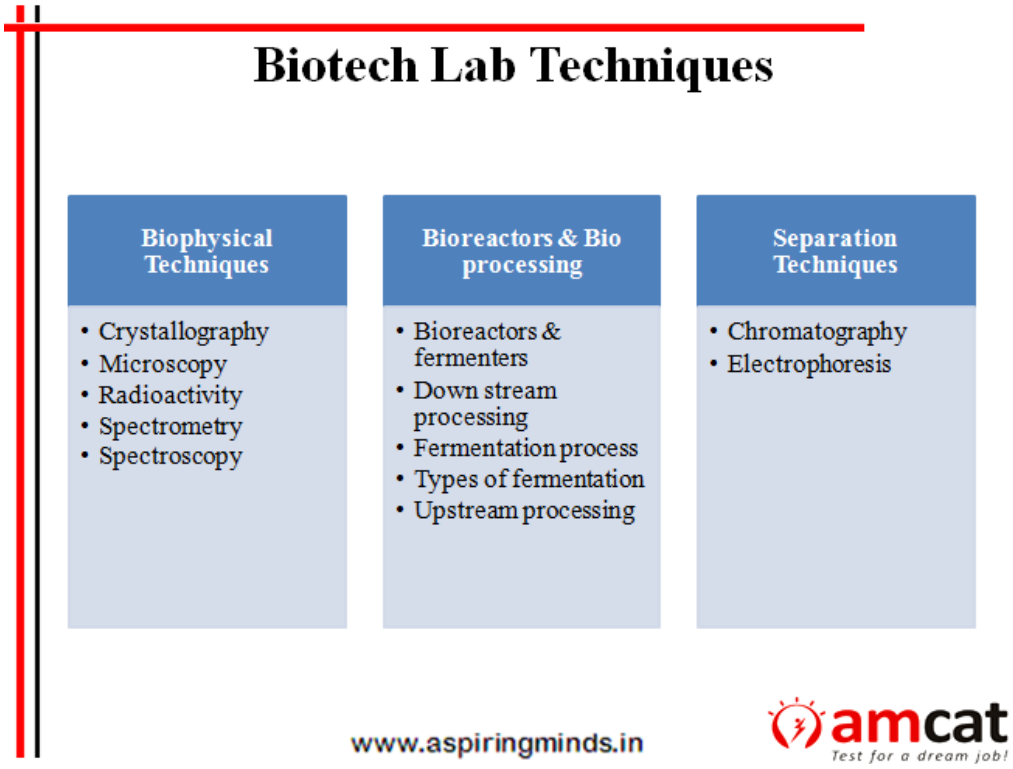


Biotech Lab Techniques:

Number of Questions: 22

Module Duration: 14 min

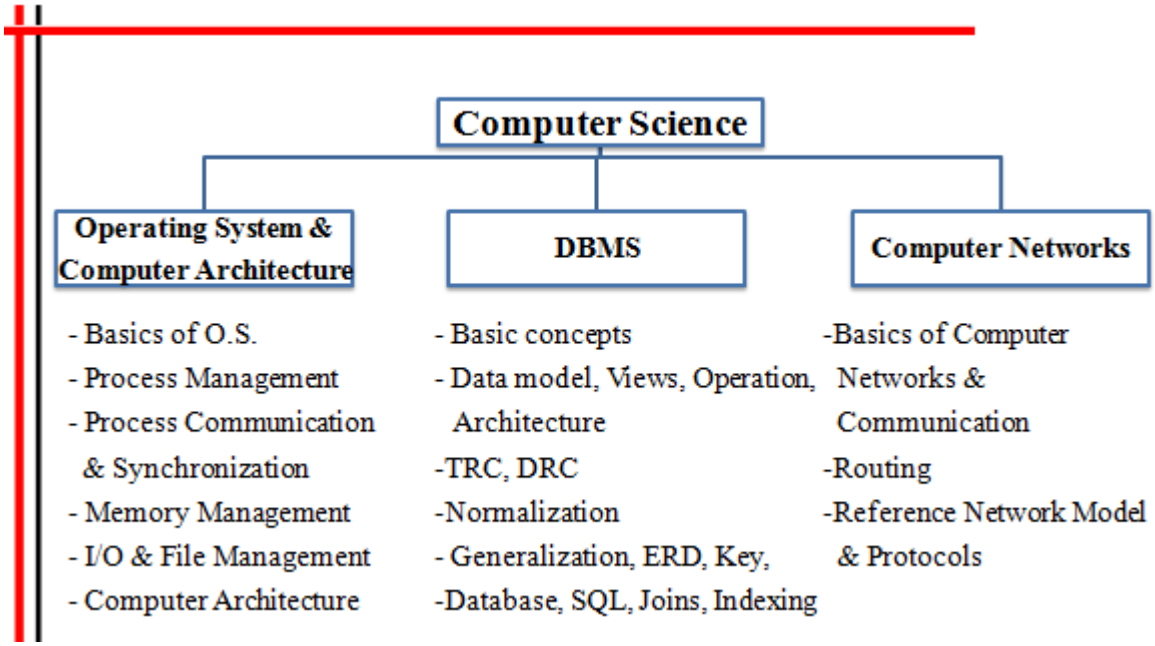
Detailed Syllabus:



COMPUTER SCIENCE

The Computer Science assessment module has been designed to assess the candidate's knowledge in basics of Operating System and Computer Architecture, Computer Networks and Database concepts. A wide variety of conceptual, output-based, numerical and application based questions on the above mentioned topics will assess the candidate's theoretical and practical knowledge and his/her comfort level in these widely used concepts.

The Software companies which hire software developers, database administrator and network engineers, use this module to evaluate and screen the applicants.



PETROCHEMICAL ENGINEERING

The module measures the knowledge and understanding of core concepts like fluid and thermal principles of petrochemical engineering, chemical reaction engineering, petroleum composition, processing, etc.

Befitting Job Functions/Profiles: This module will be relevant for Petroleum engineers, petroleum plant operators, research engineer, petrochemical plant manager, petroleum engineer trainee, safety officer, research associate- petroleum, drilling engineer, chemical engineer, project coordinator- petroleum, etc.

Number of Questions:13

Module Duration:15 minutes

Detailed Syllabus:

Fluid and Thermal Principles of Petrochemical Engineering:

• Principles of thermodynamics and Multicomponent distillation

• Fluid Mechanics

• Heat and Mass transfer

Petrochemicals:

• Chemical Processes & Engineering

• Chemical Reaction Engineering

• Industrial Chemical Technology

• Polymer Technology

• Organic chemistry and calculations

Petroleum Composition and Processing:

• Petroleum exploration and processing

• Process design and refining

• Process dynamics and instrumental analysis

• Novel separation process

• Energy and risk management

PAINT TECHNOLOGY

The module focuses on testing a student on theoretical knowledge as well as practical concepts in the branch of paint technology.

Befitting Job Functions/Profiles: Paint Technologists in paint manufacturing companies and home furnishing companies, Research and Development, Quality Assurance, Production, Marketing, Technical Assistants/Executives.

Number of Questions:20

Module Duration:15 minutes

Detailed Syllabus:

Raw Materials and Precursors

• Introduction to components of surface coatings

• Organic, inorganic pigments, extenders, dyestuff, natural resins and polymers

• Synthetic resins and polymers

Coating - Manufacturing, Evaluation, Types

• Formulation principles and manufacturing of coatings

• Coating properties and evaluation

• Industrial and specialty coatings, decorative and eco-friendly coatings

Paint Application and Troubleshooting

• Surface treatment and coating applications

• Coating defects

POLYMER ENGINEERING

The module assesses both the theoretical as well as practical knowledge of the candidate across various topics like polymer chemistry, processing, testing, etc.

Befitting Job Functions/Profiles: Production Engineers or Technologists, Quality Control Inspectors and Polymer Specialists

Number of Questions:20

Module Duration:15 minutes

Detailed Syllabus:

Polymer Chemistry and Characterization

• Chemistry of polymers

• Polymer characterization

Polymer Synthesis and Properties

• Synthesis and properties

• Polymer processing

• Polymer theology

Application of Polymers

• Polymer testing

• Polymer technology

• Polymer blends and composites

FUNDAMENTALS OF CHEMISTRY

The module assesses the candidates on the various laws, theories and principles governing the various physical phenomena in chemistry.

Befitting Job Functions/Profiles: Laboratory Assistant, Scientist, Research and Development, Chemist, Sales Representative, etc.

Number of Questions:18

Module Duration:15 minutes

Detailed Syllabus:

Physical Chemistry

- Chemical bonding
- Gaseous state
- Chemical thermodynamics
- Chemical and ionic equilibrium
- Solutions and colligative properties
- Electrochemistry
- Chemical kinetics

Inorganic Chemistry

- Periodic table and periodic properties
- Atomic Structure
- Coordination compounds

Organic Chemistry

- Basic Concepts
- Purification and characterization of organic compounds
- Types of organic reactions

For more sample question papers: https://www.myamcat.com/amcat-sample-papers

For more syllabus: https://www.myamcat.com/amcat-syllabus