



National Textile University, Faisalabad

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ENTRY TEST GUIDE BOOK 2026

For **PRE-ENGINEERING /DAE** Group Applicants



Undergraduate Admissions Preparation Guide

- BS Textile Engineering
- BS Polymer Engineering
- BS Textile Engineering Technology
- BS Garment Engineering Technology
- BS Software Engineering
- BS Computer Engineering
- BS Artificial Intelligence
- BS Computer Engineering Technology

Prepared by:
Admissions Office
National Textile University

Director Admissions:
Dr. Naseer Ahmad

NATIONAL TEXTILE UNIVERSITY

Faisalabad, Pakistan

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PREFACE

This comprehensive guide is specially designed by the **Admissions Office** for candidates seeking admission to undergraduate programs at **National Textile University (NTU), Faisalabad**. The university is a premier institution in Pakistan, renowned for its excellence in textile education, engineering, and computer sciences.

About NTU

National Textile University, located in Faisalabad, is the only university in Pakistan dedicated to textile education. It offers state-of-the-art facilities, experienced faculty, and strong industry linkages. The university has expanded its programs to include cutting-edge fields like Artificial Intelligence, Software Engineering, Computer Engineering and Computer Engineering Technology.

General Admission Criteria

- For A-Level: Three A-Levels (Mathematics, Physics, Chemistry) with IBCC equivalence
- DAE in relevant field also eligible for technology programs

Minimum Eligibility Criteria

Program	Minimum FSc/ICS (Part-I & II) Marks
Textile Engineering	60%
Polymer Engineering	60%
Textile Engineering Technology	50%
Garment Engineering Technology	50%
Software Engineering	50%
Computer Science	50%
Artificial Intelligence	50%
Computer Engineering Technology	50%

Merit Calculation Details

Program Group	Matric	Intermediate Part-I	Entry Test
Textile Related:			
Textile Engineering	15%	50%	35%
Polymer Engineering	15%	50%	35%
Textile Engineering Technology	15%	50%	35%
Garment Engineering Technology	15%	50%	35%
Computer Related:			
Software Engineering	10%	60%	30%
Computer Science	10%	60%	30%
Artificial Intelligence	10%	60%	30%
Computer Engineering Technology	10%	60%	30%

Test Structure

- **Total Questions:** 90 MCQs
- **Total Marks:** 90 (1 mark each)
- **Time:** 120 minutes
- **Sections:**
 - Section I: English (20 Questions)
 - Section II: Analytical Reasoning (20 Questions)
 - Section III: Quantitative Reasoning (20 Questions)
 - Section IV: Subject (Physics, Chemistry, Mathematics) (30 Questions)

IMPORTANT NOTE FOR CANDIDATES

Important Disclaimer

The concepts, topics, and practice questions provided in this guide book are meant to assist candidates in their preparation for the Entry Test.

While we have made every effort to cover the most important and frequently tested areas, please note that:

Majority questions may belong to these contents but are not limited to only these. Candidates are advised not to bound themselves strictly to the mentioned topics only.

A thorough study of the entire F.Sc/Intermediate curriculum is recommended for comprehensive preparation and better performance in the test.

1 ENGLISH

1.1 Important Concepts for Entry Test Preparation

1.1.1 Vocabulary Building

- **Commonly Confused Words:**

- **Accept/Except:** Accept = to receive; Except = excluding
- **Affect/Effect:** Affect = verb (to influence); Effect = noun (result)
- **Than/Then:** Than = comparison; Then = next in time
- **Their/There/They're:** Their = possessive; There = location; They're = they are
- **Your/You're:** Your = possessive; You're = you are
- **Its/It's:** Its = possessive; It's = it is
- **Lose/Loose:** Lose = misplace; Loose = not tight
- **Principal/Principle:** Principal = head of school/main; Principle = rule/belief

- **Commonly Misspelled Words:**

- Correct: **Accommodation** (not acomodation/accomodation)
- Correct: **Separate** (not seperate)
- Correct: **Definitely** (not definatly)
- Correct: **Necessary** (not neccessary)
- Correct: **Embarrass** (not embarass)
- Correct: **Occurrence** (not occurance)
- Correct: **Pronunciation** (not pronounciation)
- Correct: **Rhythm** (not rythm)
- Correct: **Consensus** (not concensus)
- Correct: **Publicly** (not publically)

- **Synonyms (Words with Similar Meanings):**

- **Reluctant:** hesitant, unwilling, resistant (Antonym: willing, eager)
- **Benevolent:** kind, generous, charitable (Antonym: cruel, malevolent)
- **Superficial:** shallow, external, surface-level (Antonym: deep, profound)
- **Abundant:** plentiful, ample, copious (Antonym: scarce)
- **Expand:** enlarge, increase, extend (Antonym: contract)
- **Diligent:** hardworking, industrious, assiduous
- **Ephemeral:** short-lived, temporary, transient
- **Ubiquitous:** everywhere, omnipresent, universal

- **Antonyms (Words with Opposite Meanings):**

- **Curtail:** reduce, shorten (Antonym: prolong, extend)
- **Elastic:** flexible, stretchy (Antonym: rigid, stiff)
- **Arrogant:** conceited (Antonym: humble, modest)
- **Brief:** short (Antonym: lengthy, prolonged)
- **Ancient:** old (Antonym: modern, new)
- **Optimist:** positive thinker (Antonym: pessimist)
- **Transparent:** clear (Antonym: opaque)

1.1.2 Grammar Essentials

- **Parts of Speech:**

- **Noun:** Person, place, thing, idea (Ali, Lahore, table, happiness)
- **Pronoun:** Replaces noun (he, she, it, they, we)
- **Verb:** Action or state (run, eat, is, are, was)
- **Adjective:** Describes noun (beautiful, tall, red)
- **Adverb:** Describes verb, adjective, or other adverb (quickly, very, quite)
- **Preposition:** Shows relationship (in, on, at, under, between)
- **Conjunction:** Connects words/clauses (and, but, or, because)
- **Interjection:** Expresses emotion (Wow! Oh! Alas!)

- **Tenses - Verb Forms:**

- **Present Simple:** Habitual actions (I eat, He eats)
- **Present Continuous:** Actions happening now (I am eating)
- **Present Perfect:** Past with present relevance (I have eaten)
- **Past Simple:** Completed past action (I ate)
- **Past Continuous:** Ongoing past action (I was eating)
- **Past Perfect:** Action before another past action (I had eaten)
- **Future Simple:** Will + verb (I will eat)
- **Future Continuous:** Will be + -ing (I will be eating)

- **Subject-Verb Agreement:**

- Singular subject → singular verb (She **doesn't like** apples)
- Plural subject → plural verb (They **like** apples)
- Each/every/either/neither → singular verb (Each student **has** a book)
- Collective nouns can be singular or plural (The team **is** winning / The team **are** arguing)

- With "either...or" / "neither...nor" - verb agrees with closer subject

- **Prepositions - Common Uses:**
 - **Interested in** (not on/at) learning
 - **Confident about/of** (not on/with) success
 - **Good at** (not in) mathematics
 - **Depend on** (not at) parents
 - **Believe in** (not on) God
 - **Arrive at** (place) / **in** (city/country)
 - **Divide into** (parts) / **between** (two) / **among** (many)
 - **Angry with** (person) / **at** (situation)

- **Active and Passive Voice:**
 - **Active:** Subject performs action (Subject + verb + object)
 - **Passive:** Subject receives action (Object + be + past participle + by + subject)
 - Example: "She writes a letter" → "A letter is written by her"
 - Example: "They built the house" → "The house was built by them"
 - Passive is used when: Agent is unknown/unimportant, or we want to emphasize object

- **Direct and Indirect Speech:**
 - Direct: He said, "I am tired."
 - Indirect: He said that he was tired.
 - Tense changes: Present → Past, Past → Past Perfect, Will → Would

1.1.3 Idioms and Phrases

- **Common Idioms:**
 - **Elephant in the room:** A major issue that everyone ignores
 - **Couch potato:** A lazy person who watches too much TV
 - **Bite the bullet:** Face a difficult situation bravely
 - **Break the ice:** Start conversation in a social setting
 - **Cost an arm and a leg:** Very expensive
 - **Hit the nail on the head:** Be exactly right
 - **Once in a blue moon:** Very rarely
 - **Piece of cake:** Very easy
 - **Spill the beans:** Reveal a secret
 - **Under the weather:** Feeling ill

1.1.4 One Word Substitution

- **Anarchist:** Person who wants to destroy all government
- **Fresco:** A picture painted on wall in water color
- **Epitaph:** Inscription on a tombstone
- **Epicure:** Person who enjoys good food and drink
- **Biped:** Animal with two feet
- **Crank:** Eccentric person with strange ideas
- **Omnipotent:** All-powerful
- **Omniscient:** All-knowing
- **Omnipresent:** Present everywhere
- **Ambidextrous:** Able to use both hands equally well

1.1.5 Reading Comprehension Tips

- **Strategies for Comprehension:**
 - Read the questions first to know what to look for
 - Skim the passage for main idea (first and last paragraphs)
 - Scan for specific details (names, dates, keywords)
 - Look for topic sentences (usually first sentence of each paragraph)
 - Pay attention to transition words (however, therefore, moreover)
 - Identify the author's tone (positive, negative, neutral)
 - Distinguish between facts and opinions
 - Make inferences based on evidence in text

2 ANALYTICAL REASONING

2.1 Overview

Analytical Reasoning tests your logical thinking, problem-solving ability, and capacity to analyze complex situations. This section carries 20 questions and requires systematic approach and practice.

2.2 Types of Analytical Reasoning Questions

- **Arrangement Problems:** Seating arrangements, committee formations, orderings
- **Blood Relations:** Family trees, relationships
- **Logical Deductions:** If-then statements, conditional logic
- **Sequence and Series:** Pattern recognition
- **Puzzles:** Grid-based problems, scheduling

2.3 Key Tactics for Analytical Reasoning

- ! **Read the Entire Setup First:** Understand all conditions before attempting questions. Underline key constraints.
- ! **Draw Diagrams:** For arrangement problems, draw positions. For blood relations, draw family trees. Visual representation saves time.
- ! **Use Symbols and Abbreviations:** Represent people/items with initials (A, B, C) to save time.
- ! **Create Tables:** For complex arrangements, use tables to track possibilities.
- ! **Apply "If" Conditions Systematically:** When a question begins with "If...", apply that condition first and then see what else must be true.
- ! **Look for Fixed Positions:** Identify elements that have fixed positions based on conditions.
- ! **Use Elimination Method:** Eliminate options that violate any given condition.
- ! **Check Boundary Conditions:** Pay attention to words like "exactly one", "at least", "at most", "immediately before/after".
- ! **Practice Speed:** Analytical questions can be time-consuming. Practice to improve speed without compromising accuracy.

! Verify Your Answer: Quickly check if your answer satisfies all given conditions.

2.4 Solved Examples with Tactics

Example 1: Committee Arrangement (with Tactic Application)

Question: Nine individuals: Ahmed, Bilal, Danish, Faisal, Haroon, Liaquat, Maryam, Shiza and Zeeshan are to serve on three committees labeled A, B and C.

- Each candidate should serve on exactly one of the committees
- Every committee must have at least one member
- Committee A should consist of exactly one member more than that of committee B
- Among Maryam, Shiza and Zeeshan none can serve on committee A
- Among Faisal, Haroon and Liaquat none can serve on committee B
- Among Ahmed, Bilal and Danish none can serve on committee C

If Danish and Zeeshan are the individuals serving on committee B, how many of the nine individuals should serve on committee C?

Tactic Applied: Draw and Use Variables

1. Total individuals = 9
2. Committee A = Committee B + 1
3. Given: Danish and Zeeshan on B \rightarrow B has at least 2 members
4. Let B = x members, then A = x + 1, and C = 9 - (2x + 1) = 8 - 2x
5. For C to be at least 1, x \leq 3.5, so x can be 1, 2, or 3
6. Given B has Danish and Zeeshan (2 members), x = 2
7. Then A = 3, and C = 9 - 5 = 4

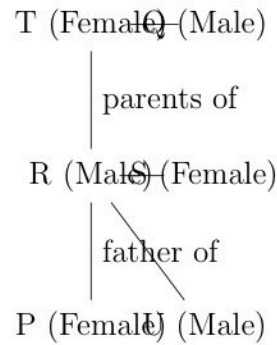
Answer: C. 4

Example 2: Blood Relations (with Tactic Application)

Question: P, Q, R, S, T and U are six family members. Three are males. There are two married couples. R is father of P and U. T is mother of R. P is granddaughter of Q.

Find: How is U related to P?

Tactic Applied: Draw Family Tree

**Solution:**

- R is father of P and U \rightarrow R is male, P and U are R's children
- T is mother of R \rightarrow T is female, R's mother
- P is granddaughter of Q \rightarrow Q is grandparent of P
- Since T is R's mother and P is R's daughter, T is grandmother of P
- Therefore Q must be grandfather (since three males: R, Q, and one more)
- R and his wife (S) are one married couple
- T and Q are another married couple (parents of R)
- U is sibling of P (brother or sister)

Answer: D. Brother (if U is male) or **A. Sister** (if U is female)

2.5 Practice Questions

1. In the above family tree, who is the husband of T?
 - (A) Q
 - (B) R
 - (C) U
 - (D) None of these
2. If it is true that "streets are wet whenever it is raining," which of the following must be true?
 - (A) If streets are wet, it is raining
 - (B) If streets are wet but sidewalks not wet, it is not raining
 - (C) If not raining, streets are not wet
 - (D) I and II only

2.6 Answer Key for Practice Questions

Q. No.	Answer
1	A
2	B

3 QUANTITATIVE REASONING

3.1 Overview

Quantitative Reasoning tests your mathematical skills, numerical ability, and problem-solving speed. This section carries 20 questions and requires quick calculations and formula recall.

3.2 Topics Covered

- Percentages
- Number Theory and Divisibility
- Geometry (Circles, Area, Circumference)
- Exponents and Powers
- Ratios and Proportions
- Fractions and Decimals
- Linear and Simultaneous Equations
- Work and Time Problems
- Algebra

3.3 Key Formulas

Concept	Formula
Percentage	$\% = (\text{Part/Whole}) \times 100$
Circle Circumference	$C = 2r = d$
Circle Area	$A = r^2$
Exponents	$a \times a = a$
Successive Discounts	Single Discount = $a + b - (ab/100)$
Work Formula	$1/T = 1/T + 1/T$
Quadratic Formula	$x = [-b \pm (b^2 - 4ac)]/2a$
Distance Formula	$d = [(x-x)^2 + (y-y)^2]$

3.4 Key Tactics for Quantitative Reasoning

! Memorize Key Formulas: Create a formula sheet and review it regularly. Quick recall saves valuable time.

! Estimate First: Before calculating, estimate the answer to eliminate obviously wrong options.

! Use Back-Solving: For multiple choice questions, substitute options back into the equation to find the correct one.

- ! **Look for Patterns:** Many questions follow common patterns (e.g., 10% of something, half of something).
- ! **Simplify Before Calculating:** Reduce fractions, cancel common factors before performing complex calculations.
- ! **Check Units:** Ensure all units are consistent (e.g., convert feet to inches, hours to minutes).
- ! **Use Approximation:** For questions with or square roots, use approximate values ($\sqrt{10} \approx 3.14$, $\sqrt{2} \approx 1.41$).
- ! **Identify Question Type:** Quickly categorize the question (percentage, work, ratio) to recall the appropriate formula.
- ! **Skip and Return:** If a question seems too time-consuming, mark it and return later. Don't waste precious time.
- ! **Verify with Common Sense:** After getting an answer, check if it makes logical sense (e.g., probability between 0 and 1).

3.5 Solved Examples with Tactics

Example 1: Percentage (with Tactic Application)

Question: 15% of 32 equals?

Tactic Applied: Estimate First

$$15\% \text{ of } 32 = 10\% \text{ of } 32 (3.2) + 5\% \text{ of } 32 (1.6) = 4.8$$

Answer: B. 4.8

Example 2: Divisibility (with Tactic Application)

Question: A number divisible by both 6 and 8 is also divisible by?

Tactic Applied: Use LCM

LCM of 6 and 8 = 24. Any number divisible by both must be divisible by their LCM.

Answer: D. 24

Example 3: Work Problem (with Tactic Application)

Question: If Adil can finish a job in 5 hours and Moeed in 10 hours, how many minutes will both take together?

Tactic Applied: Use Work Formula

$$\begin{aligned} \text{Adil's rate} &= 1/5 \text{ job/hour} \\ \text{Moeed's rate} &= 1/10 \text{ job/hour} \\ \text{Combined rate} &= 1/5 + 1/10 = 3/10 \text{ job/hour} \\ \text{Time} &= 1/(3/10) = 10/3 \text{ hours} \\ &= (10/3)60 = 200 \text{ minutes} \end{aligned}$$

Answer: C. 200

Example 4: Simultaneous Equations (with Tactic Application)

Question: If $x + 3y = 7$ and $2x + y = 5$, then x/y is?

Tactic Applied: Elimination Method

Multiply second equation by 3: $6x + 3y = 15$

Subtract first equation: $(6x + 3y) - (x + 3y) = 15 - 7$

$5x = 8 \rightarrow x = 8/5$

Substitute: $8/5 + 3y = 7 \rightarrow 3y = 7 - 8/5 = 35/5 - 8/5 = 27/5 \rightarrow y = 9/5$

$x/y = (8/5)/(9/5) = 8/9$

Answer: A. 8/9

3.6 Practice Questions

1. If $x + 3y = 7$ and $2x + y = 5$, then x/y is?
 - (A) $8/9$
 - (B) $1/2$
 - (C) $1/3$
 - (D) $2/5$
2. If the radius of a circle is halved, its area becomes:
 - (A) Same
 - (B) Double
 - (C) Half
 - (D) Quarter
3. $1250 \div 25 \times 0.5 = ?$
 - (A) 100
 - (B) 50
 - (C) 25
 - (D) 2.5

3.7 Answer Key for Practice Questions

Q. No.	Answer
1	A
2	D
3	C

4 PHYSICS

4.1 Important Concepts for Entry Test Preparation

4.1.1 Mechanics - The Study of Motion and Forces

- **Kinematics (Motion without Forces):**

- **Scalars:** Magnitude only (distance, speed, mass, time, energy)
- **Vectors:** Magnitude and direction (displacement, velocity, acceleration, force)
- **Equations of Motion (constant acceleration):**

$$v = u + at, \quad s = ut + \frac{1}{2}at^2, \quad v^2 = u^2 + 2as$$

where u = initial velocity, v = final velocity, a = acceleration, t = time, s = displacement

- **Acceleration Due to Gravity:** $g = 9.8 \text{ m/s}^2$ downward
 - **Projectile Motion:** Horizontal velocity constant, vertical acceleration = g
 - **Range Formula:** $R = (u^2 \sin 2\theta)/g$
 - **Maximum Height:** $H = (u^2 \sin^2 \theta)/2g$
- **Dynamics (Forces and Motion):**
 - **Newton's First Law:** Object at rest stays at rest; object in motion stays in motion unless acted upon by external force (Law of Inertia)
 - **Newton's Second Law:** $F = ma$ (Force = mass \times acceleration)
 - **Newton's Third Law:** Every action has equal and opposite reaction
 - **Momentum:** $p = mv$ (kg·m/s)
 - **Impulse:** $F \cdot t = p$ (change in momentum)
 - **Conservation of Momentum:** Total momentum before = Total momentum after (in isolated system)
 - **Friction:** $f = N \mu$ (μ = coefficient of friction, N = normal force)
 - **Tension:** Force in rope or string
 - **Work, Energy, and Power:**
 - **Work:** $W = Fd \cos \theta$ (Joules)
 - **Kinetic Energy:** $KE = \frac{1}{2}mv^2$ (energy of motion)
 - **Potential Energy:** $PE = mgh$ (gravitational potential energy)
 - **Elastic Potential Energy:** $PE = \frac{1}{2}kx^2$ (spring)
 - **Law of Conservation of Energy:** Energy cannot be created or destroyed, only transformed

- **Power:** $P = W/t = Fv$ (Watts)
- **Efficiency:** $\text{Efficiency} = (\text{Useful output energy} / \text{Input energy}) \times 100\%$
- **Circular Motion and Gravitation:**
 - **Centripetal Acceleration:** $a_c = v/r = r$
 - **Centripetal Force:** $F_c = mv/r$
 - **Newton's Law of Gravitation:** $F = G(mm)/r^2$, where $G = 6.67 \times 10^{11} \text{ N}\cdot\text{m}^2/\text{kg}^2$
 - **Orbital Velocity:** $v = (GM/r)$
 - **Escape Velocity:** $v_e = (2GM/R) = (2gR)$

4.1.2 Waves and Optics

- **Wave Properties:**
 - **Wavelength (λ):** Distance between two consecutive crests/troughs (meters)
 - **Frequency (f):** Number of waves per second (Hertz)
 - **Time Period (T):** $T = 1/f$ (seconds)
 - **Wave Speed:** $v = f\lambda$
 - **Amplitude:** Maximum displacement from equilibrium
 - **Transverse Waves:** Particles vibrate perpendicular to wave direction (light, waves on string)
 - **Longitudinal Waves:** Particles vibrate parallel to wave direction (sound)
- **Sound Waves:**
 - Speed of sound in air: 340 m/s (at room temperature)
 - Speed increases with temperature
 - **Loudness:** Depends on amplitude (measured in decibels)
 - **Pitch:** Depends on frequency
 - **Quality (Timbre):** Depends on waveform
 - **Doppler Effect:** Change in frequency due to relative motion
 - **Beats:** Interference of two slightly different frequencies
- **Light and Optics:**
 - Speed of light in vacuum: $c = 3 \times 10^8 \text{ m/s}$
 - **Reflection:** Angle of incidence = Angle of reflection
 - **Refraction:** Bending of light when entering different medium

- **Snell's Law:** $n \sin i = n' \sin r$
 - **Refractive Index:** $n = c/v$ (speed in vacuum / speed in medium)
 - **Critical Angle:** $\sin c = n/n'$ (for total internal reflection)
 - **Lens Formula:** $1/f = 1/p + 1/q$ (f = focal length, p = object distance, q = image distance)
 - **Magnification:** $M = -q/p = h_i/h_o$
 - **Convex Lens:** Converging, forms real or virtual images
 - **Concave Lens:** Diverging, always forms virtual images
- **Physical Optics:**
 - **Interference:** Young's double-slit experiment
 - **Diffraction:** Bending of light around obstacles
 - **Polarization:** Restriction of light vibrations to one plane
 - **Dispersion:** Splitting of white light into colors (prism)

4.1.3 Electricity and Magnetism

- **Electrostatics:**
 - **Coulomb's Law:** $F = k(qq)/r^2$, where $k = 9 \times 10^9 \text{ N}\cdot\text{m}^2/\text{C}^2$
 - **Electric Field:** $E = F/q = kQ/r^2$ (N/C or V/m)
 - **Electric Potential:** $V = kQ/r$ (Volts)
 - **Capacitance:** $C = Q/V$ (Farads)
 - **Capacitor Energy:** $E = \frac{1}{2}CV^2$
- **Current Electricity:**
 - **Current:** $I = Q/t$ (Amperes)
 - **Ohm's Law:** $V = IR$ (Voltage = Current \times Resistance)
 - **Resistance:** $R = L/A$ (ρ = resistivity, L = length, A = cross-sectional area)
 - **Resistors in Series:** $R_{total} = R + R + R + \dots$
 - **Resistors in Parallel:** $1/R_{total} = 1/R + 1/R + 1/R + \dots$
 - **Electrical Power:** $P = VI = I^2R = V^2/R$ (Watts)
 - **Electrical Energy:** $E = Pt$ (kWh)
- **Magnetism:**
 - **Magnetic Field:** Around moving charges, current-carrying wires
 - **Force on Moving Charge:** $F = qvB \sin \theta$ (Lorentz force)
 - **Force on Current-Carrying Wire:** $F = BIL \sin \theta$

- **Electromagnetic Induction:** Faraday's Law: $\text{emf} = -N(\Delta\Phi/\Delta t)$
- **Lenz's Law:** Induced current opposes change in flux
- **Transformer:** $V_1/V_2 = N_1/N_2$; $P_{in} = P_{out}(\text{ideal})$
- **Electrical Instruments:**
 - **Ammeter:** Measures current, connected in series, low resistance
 - **Voltmeter:** Measures voltage, connected in parallel, high resistance
 - **Galvanometer:** Detects small currents
 - **Potentiometer:** Measures potential difference without drawing current

4.1.4 Modern Physics

- **Quantum Theory:**
 - **Photon Energy:** $E = hf = hc/\lambda$, where $h = 6.63 \times 10^{-34}$ J·s (Planck's constant)
 - **Photoelectric Effect:** Einstein's explanation; $K.E._{max} = hf - \phi$ ($\phi = \text{work function}$)
 - **de Broglie Wavelength:** $\lambda = h/p$ (particle-wave duality)
 - **Heisenberg Uncertainty Principle:** $\Delta x \Delta p \geq h/4\pi$
- **Atomic Physics:**
 - **Bohr's Model:** Electrons in discrete orbits; $E_n = -13.6/n^2 \text{ eV}$
 - **Emission Spectrum:** When electrons jump from higher to lower energy levels
 - **Absorption Spectrum:** When electrons absorb energy and jump to higher levels
 - **X-rays:** Produced when high-speed electrons strike metal target
- **Nuclear Physics:**
 - **Nuclear Structure:** Protons and neutrons in nucleus
 - **Atomic Number (Z):** Number of protons
 - **Mass Number (A):** Number of protons + neutrons
 - **Isotopes:** Same Z, different A
 - **Nuclear Binding Energy:** $E = \Delta m c^2$ (mass defect converted to energy)
 - **Radioactivity:** Alpha (α), Beta (β), Gamma (γ) decay
 - **Half-Life:** Time for half of radioactive sample to decay
 - **Nuclear Fission:** Splitting of heavy nucleus (nuclear reactors)
 - **Nuclear Fusion:** Combining light nuclei (sun, stars)

- **Relativity:**

- **Mass-Energy Equivalence:** $E = mc^2$
- **Time Dilation:** Time slows down at high speeds
- **Length Contraction:** Length decreases at high speeds

5 CHEMISTRY

5.1 Important Concepts for Entry Test Preparation

5.1.1 Atomic Structure and Periodic Table

- **Atomic Structure:**

- **Protons:** Positively charged, in nucleus, atomic number (Z)
- **Neutrons:** Neutral, in nucleus, mass number (A) = protons + neutrons
- **Electrons:** Negatively charged, in shells/orbitals around nucleus
- **Isotopes:** Same number of protons, different number of neutrons (e.g., C-12, C-14)
- **Ions:** Atoms with charge (cations = positive, anions = negative)

- **Electronic Configuration:**

- Shells: K (2), L (8), M (18), N (32) - capacity = $2n^2$
- Subshells: s (2 electrons), p (6 electrons), d (10 electrons), f (14 electrons)
- Aufbau principle: Electrons fill lowest energy levels first
- Hund's rule: Electrons occupy orbitals singly before pairing
- Pauli exclusion principle: No two electrons have same set of quantum numbers

- **Periodic Trends:**

- **Atomic Radius:** Decreases left to right (increased nuclear charge), increases down a group (new shells added)
- **Ionization Energy:** Energy required to remove an electron; increases left to right, decreases down a group
- **Electron Affinity:** Energy released when electron is added; increases left to right
- **Electronegativity:** Ability to attract electrons; increases left to right, decreases down a group
- **Metallic Character:** Decreases left to right, increases down a group

- **Periodic Table Groups:**

- Group 1: Alkali metals (highly reactive, 1 valence electron)
- Group 2: Alkaline earth metals (reactive, 2 valence electrons)
- Group 17: Halogens (highly reactive nonmetals, 7 valence electrons)
- Group 18: Noble gases (inert, full valence shell)
- Transition Metals: Variable oxidation states, colored compounds

5.1.2 Chemical Bonding

- **Ionic Bonding:**

- Complete transfer of electrons from metal to nonmetal
- Forms cations (+) and anions (-)
- Strong electrostatic forces of attraction
- High melting and boiling points
- Conduct electricity in molten or aqueous state
- Examples: NaCl, MgO, CaF

- **Covalent Bonding:**

- Sharing of electron pairs between nonmetals
- Single bond: One pair shared (H, Cl)
- Double bond: Two pairs shared (O, CO)
- Triple bond: Three pairs shared (N, CH)
- Polar covalent: Unequal sharing (HO, HCl)
- Nonpolar covalent: Equal sharing (O, N)
- Low melting and boiling points
- Do not conduct electricity

- **Coordinate Covalent Bond:**

- Both shared electrons come from one atom
- Also called dative bond
- Examples: NH, HO

- **Metallic Bonding:**

- Sea of electrons around positive metal ions
- Malleable and ductile
- Good conductors of heat and electricity

- **Intermolecular Forces:**

- **Hydrogen Bonding:** Strongest IMF; occurs when H is bonded to F, O, or N; responsible for high boiling point of water
- **Dipole-Dipole Forces:** Between polar molecules
- **London Dispersion Forces:** Weakest; present in all molecules; increases with molecular size

- **Molecular Shapes (VSEPR Theory):**

- Linear: 2 bond pairs (CO, BeCl)
- Trigonal planar: 3 bond pairs (BF)
- Tetrahedral: 4 bond pairs (CH)
- Trigonal pyramidal: 3 bond pairs + 1 lone pair (NH)
- Bent/V-shaped: 2 bond pairs + 2 lone pairs (HO)

5.1.3 Organic Chemistry - The Chemistry of Carbon

- **Hydrocarbons:**
 - **Alkanes:** CH, single bonds, saturated, undergo substitution reactions
 - **Alkenes:** CH, double bond, unsaturated, undergo addition reactions
 - **Alkynes:** CH, triple bond, unsaturated, undergo addition reactions
 - **Aromatic:** Benzene ring structure, special stability
- **Functional Groups:**
 - **Alcohols:** -OH (methanol, ethanol)
 - **Aldehydes:** -CHO (formaldehyde, acetaldehyde)
 - **Ketones:** -CO- (acetone)
 - **Carboxylic Acids:** -COOH (acetic acid, formic acid)
 - **Esters:** -COOR (fruity smell)
 - **Ethers:** -O- (diethyl ether)
 - **Amines:** -NH (aniline)
 - **Halides:** -X (Cl, Br, I)
- **Organic Reactions:**
 - **Substitution:** Alkane + Halogen → Haloalkane (requires UV light)
 - **Addition:** Alkene + Halogen → Dihaloalkane
 - **Elimination:** Alcohol → Alkene (with conc. HSO)
 - **Oxidation:** Primary alcohol → Aldehyde → Carboxylic acid
 - **Esterification:** Carboxylic acid + Alcohol → Ester + Water
 - **Polymerization:** Monomers join to form polymers
- **Petroleum and Fuels:**
 - Fractional distillation separates crude oil into fractions
 - Octane number: Measure of fuel quality
 - Cracking: Breaking larger hydrocarbons into smaller ones
 - Reforming: Converting straight-chain to branched-chain hydrocarbons

5.1.4 Physical Chemistry Essentials

- **Acids and Bases:**

- pH scale: 0-14; $\text{pH} = -\log[\text{H}^+]$
- $\text{pH} < 7$: Acidic; $\text{pH} = 7$: Neutral; $\text{pH} > 7$: Basic
- Strong acids: HCl, H₂SO₄, HNO₃ (fully dissociate)
- Weak acids: CH₃COOH, HCO₂H (partially dissociate)
- Strong bases: NaOH, KOH (fully dissociate)
- Weak bases: NH₃ (partially dissociate)

- **Chemical Equilibrium:**

- Dynamic equilibrium: Forward rate = Reverse rate
- Le Chatelier's Principle: System at equilibrium responds to stress
- Factors affecting equilibrium: Concentration, Pressure, Temperature

- **Thermochemistry:**

- Exothermic reactions: Release heat (ΔH negative) (combustion)
- Endothermic reactions: Absorb heat (ΔH positive) (photosynthesis)
- Activation energy: Energy required to start reaction

- **Electrochemistry:**

- Oxidation: Loss of electrons
- Reduction: Gain of electrons (OIL RIG)
- Electrochemical cells: Convert chemical energy to electrical energy
- Electrolytic cells: Use electrical energy to drive non-spontaneous reactions

6 MATHEMATICS

6.1 Important Concepts for Entry Test Preparation

6.1.1 Algebra and Equations

- **Linear Equations:**

- Form: $ax + b = 0$
- Solution: $x = -b/a$
- Simultaneous equations: Solve by substitution or elimination

- **Quadratic Equations:**

- Form: $ax^2 + bx + c = 0$
- Quadratic formula: $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
- Discriminant: $D = b^2 - 4ac$
 - $D > 0$: Two distinct real roots
 - $D = 0$: One real root (repeated)
 - $D < 0$: No real roots (complex)

6.1.2 Arithmetic Progression (AP)

- **General Form:** $a, a+d, a+2d, a+3d, \dots$
- **nth Term:** $a_n = a + (n - 1)d$
- **Sum of n Terms:** $S_n = \frac{n}{2}[2a + (n - 1)d] = \frac{n}{2}(a + a_n)$
- **Arithmetic Mean:** $AM = (a + b)/2$

6.1.3 Permutations and Combinations

- **Permutations (arrangements):** ${}^n P_r = \frac{n!}{(n-r)!}$
- **Combinations (selections):** ${}^n C_r = \frac{n!}{r!(n-r)!}$
- **Distributing distinct objects:** Number of ways to distribute n distinct objects among r persons = r^n

6.1.4 Binomial Theorem

- **General Expansion:** $(a + b)^n = \sum_{r=0}^n \binom{n}{r} a^{n-r} b^r$
- **Sum of exponents:** In each term, sum of exponents of a and $b = n$
- **General Term:** $T_{r+1} = \binom{n}{r} a^{n-r} b^r$

6.1.5 Coordinate Geometry

- **Distance Formula:** $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
- **Midpoint Formula:** $M = \left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$
- **Slope:** $m = \frac{y_2-y_1}{x_2-x_1}$

6.1.6 Circle Geometry

- **Equation of Circle:** $(x - h)^2 + (y - k)^2 = r^2$ where (h,k) is center, r is radius
- **Chord:** Line segment whose endpoints lie on the circle
- **Radius:** Constant distance from center to any point on circle
- **Diameter:** $2 \times$ radius, longest chord
- **Secant:** Line intersecting circle at two points
- **Tangent:** Line touching circle at exactly one point

6.1.7 Vectors

- **Null Vector:** Vector of magnitude zero
- **Position Vector:** Vector from origin to a point
- **Magnitude:** $|\mathbf{v}| = \sqrt{x^2 + y^2 + z^2}$

6.1.8 Linear Programming

- **Solution Region:** Region satisfying all constraints
- **Vertex:** Point where two boundary lines intersect
- **Feasible Region:** Set of all possible solutions
- **Optimal Solution:** Occurs at a vertex of feasible region

6.1.9 Multiplicative Inverse

- **Definition:** Multiplicative inverse of x is $1/x$ (for $x \neq 0$)
- **For $x = 0$:** Multiplicative inverse does not exist

BUBBLE SHEET GUIDE

How to Mark Your Answers Correctly

What is a Bubble Sheet?

A bubble sheet is the answer sheet used in multiple-choice tests where you darken circles corresponding to your chosen answers. It is scanned by a machine, so correct marking is essential.

Sample Bubble Sheet Format

SAMPLE BUBBLE SHEET

(Questions 1-10 shown as example)

1	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<i>Correctly filled - Question 1: B</i>
2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
10	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	A	B	C	D	

Important Rules for Bubble Sheet Marking

- ! **Use HB or No. 2 Pencil Only:** Ball pens or ink pens are not accepted. The scanner cannot read ink marks properly.
- ! **Fill Completely:** Darken the entire circle. Do not use check marks (✓), crosses (X), or ticks.
- ! **Stay Within the Circle:** Do not mark outside the circle. The scanner reads only the circle area.
- ! **No Stray Marks:** Avoid any extra marks on the sheet. Even small dots can be misread as answers.
- ! **Erase Completely:** If you change an answer, erase the first mark completely. Partial erasures may be read as answers.

- ! **Match Question Numbers:** Ensure you are marking the correct question number. Double-check frequently.
- ! **One Answer Per Question:** Mark only one circle per question. Multiple marks will be read as incorrect.
- ! **Keep Sheet Clean:** Do not fold, crumple, or make the sheet dirty. Damaged sheets may not scan properly.

Do's and Don'ts

DO's	DON'Ts
<ul style="list-style-type: none"> • Use pencil only • Fill circle completely • Erase mistakes fully • Keep sheet flat • Check question numbers • Mark one answer only 	<ul style="list-style-type: none"> • Use pen or marker • Use ticks or crosses • Leave partial erasures • Fold or crumple sheet • Mark wrong numbers • Mark multiple answers

Correct vs. Incorrect Marking

CORRECT INCORRECT INCORRECT INCORRECT



Before Submitting

- Count your answers to ensure you've answered all questions
- Check for any accidental double markings
- Ensure your name and roll number are written correctly
- Verify that your pencil marks are dark enough

7 NTU ECAT SAMPLE PAPER

SAMPLE PAPER

National Textile University, Faisalabad
Undergraduate Admission Test 2026
For Pre-Engineering / DAE Group

Name: _____ Roll _____ No: _____ Date: _____

Time Allowed: 120 Minutes Total Questions: 90 Total Marks: 90

PAPER STRUCTURE SUMMARY

Section	Subject Area	Questions	Marks
Section I	English	1 - 20	20
Section II	Analytical Reasoning	21 - 40	20
Section III	Quantitative Reasoning	41 - 60	20
Section IV	Physics, Chemistry, Mathematics	61 - 90	30
GRAND TOTAL			90

Section I: English (Questions 1-20)

1. Antonym of CURTAIL is _____?

- (A) Cramp
- (B) Prolong
- (C) Chop
- (D) Clip

2. Antonym of Elastic is _____?

- (A) Yielding
- (B) Rigid
- (C) Mold-able
- (D) Supple

3. Synonym of ARROGANT is _____?

- (A) Conceited
 - (B) Humble
 - (C) Progressive
 - (D) Noble
4. **Synonym of ALERT is _____?**
- (A) Intelligent
 - (B) Energetic
 - (C) Observant
 - (D) Watchful
5. **GRAIN: SALT ::**
- (A) shard: pottery
 - (B) shred: wood
 - (C) blades: grass
 - (D) chip: glass
6. **LIGHT: BLIND ::**
- (A) speech: dumb
 - (B) language: deaf
 - (C) tongue: sound
 - (D) voice: vibration
7. **Ocean currents play a _____ role in setting long-term climate _____.**
- (A) vital ... date
 - (B) important ... variations
 - (C) major ... patterns
 - (D) unusual ... changes
8. **I promise to _____ you in all circumstances.**
- (A) stand up to
 - (B) stand with
 - (C) stand off
 - (D) stand by
9. **It's difficult _____ reconcile such different points of view.**
- (A) With
 - (B) to
 - (C) in

- (D) on
10. The speaker did not properly space out his speech but went on ----- one point only.
- (A) stressing
(B) avoiding
(C) devoting
(D) decrying
11. A picture in water color on wall:
- (A) Epitaph
(B) Epicure
(C) Fatal
(D) Fresco
12. A person who wants to destroy all government and orders:
- (A) Brail
(B) Anarchist
(C) Biped
(D) Crank
13. The Phrase/idiom "Elephant in the room" means:
- (A) A major issue
(B) A minor problem
(C) An idiot person
(D) A giant man
14. My friend is a couch potato. What does the idiom/phrase "couch potato" means?
- (A) active person
(B) busy person
(C) lazy person
(D) angry person
15. He is walking ----- road.
- (A) By
(B) On
(C) With
(D) In
16. The boy fell ----- the pond yesterday.

- (A) into
- (B) in
- (C) from
- (D) over

Directions (Questions 17-20): Read the passage carefully and answer the questions that follow:

Unemployment is a key index of economic slack and lost output. But it is not distributed in proportion to people's ability to face it. It affects painfully the young, women, the unskilled as well as semiskilled, the black person, the older people, and underemployed people in rural areas. Unemployment among specific groups means greater costs to society that can be calculated easily in hours of idleness or dollars of income lost. The other costs include disturbance of the careers and increased juvenile delinquency. There is another cost of unemployment. For laborers, continuous unemployment results in "share-the-work" pressures for shorter hours and escalate resistance to technological advances. On the business side, the shortcomings of markets result in attempts to raise prices to cover increased costs and to pressures for protection against buying products from abroad.

17. Unemployment is an index of

- (A) the employment rate
- (B) economic slack and lost output
- (C) diminished resources
- (D) over utilization of capacity

18. According to the passage, the unemployment falls most heavily upon all except the

- (A) unskilled worker
- (B) semiskilled worker
- (C) black people
- (D) white middle class

19. The cost to society of unemployment can be measured by all except

- (A) disruption of careers
- (B) Idleness
- (C) the death rate
- (D) lost incomes

20. Serious unemployment results in labor groups to demand

- (A) more jobs with shorter hours
- (B) "no fire" policies
- (C) higher wages to those employed
- (D) cost-cutting solutions

Section II: Analytical Reasoning (Questions 21-40)

Directions (Questions 21-27): Nine individuals: Ahmed, Bilal, Danish, Faisal, Haroon, Liaquat, Maryam, Shiza and Zeeshan are to serve on three committees labeled A, B and C.

- Each candidate should serve on exactly one of the committees
 - Every committee must have at least one member
 - Committee A should consist of exactly one member more than that of committee B
 - Among Maryam, Shiza and Zeeshan none can serve on committee A
 - Among Faisal, Haroon and Liaquat none can serve on committee B
 - Among Ahmed, Bilal and Danish none can serve on committee C
21. In case Danish and Zeeshan are the individuals serving on committee B, how many of the nine individuals should serve on committee C?
- (A) 2
 - (B) 3
 - (C) 4
 - (D) 5
22. Of the nine individuals, the maximum number that can serve together on committee C is
- (A) 5
 - (B) 6
 - (C) 7
 - (D) 8
23. In case Ahmed is the only individual serving on committee B, which among the following should serve on committee A?
- (A) Bilal and Danish
 - (B) Bilal and Faisal
 - (C) Bilal and Liaquat
 - (D) Faisal and Haroon
24. In case, any of the nine individuals serves on committee C, which among the following could not be the candidate to serve on committee A?
- (A) Ahmed
 - (B) Bilal

- (C) Danish
(D) Shiza
25. In case, Bilal, Danish and Maryam are the only individuals serving on committee B, the total membership of committee C should be
- (A) 5
(B) 4
(C) 3
(D) 2
26. In case, Bilal, Danish and Maryam are the only individuals serving on committee B, then the members of committee C should be
- (A) Haroon and Shiza
(B) Maryam and Zeeshan
(C) Shiza and Zeeshan
(D) Faisal and Shiza
27. Among the following combinations which could constitute the membership of committee C?
- (A) Danish and Shiza
(B) Faisal and Maryam
(C) Liaquat, Maryam and Shiza
(D) Faisal, Haroon and Liaquat

Directions (Questions 28-32): Read the following information carefully and answer the questions based on it:

- P, Q, R, S, T and U are six members of a family. Out of six members three are male members.
 - There are two married couples among them
 - R is the father of P and U, and T is the mother of R
 - P is the granddaughter of Q
28. How is U related to P?
- (A) Sister
(B) Son
(C) Daughter
(D) Brother
29. How Q is related to U?

- (A) Brother
(B) Grandfather
(C) Husband
(D) None of these
- 30. Which of the following pairs is one of the married couples?**
- (A) TU
(B) QS
(C) TQ
(D) None of these
- 31. Which of the following is a group of male members?**
- (A) Q, S, T
(B) P, U, Q
(C) Q, R, U
(D) None of these
- 32. Who is the husband of T?**
- (A) Q
(B) R
(C) U
(D) None of these
- 33. If it is true that the streets and the sidewalks are wet whenever it is raining, which of the following must also be true?**
- I. If the streets and sidewalks are wet, it is raining.
II. If the streets are wet but the sidewalks are not wet, it is not raining.
III. If it is not raining, the streets and sidewalks are not wet.
- (A) I only
(B) II only
(C) III only
(D) I and II only
- 34. Arrange in appropriate sequence (shoulder to the finger): 1. Shoulder 2. Wrist 3. Elbow 4. Palm 5. Finger**
- (A) 1, 4, 2, 3, 1
(B) 3, 4, 5, 2, 1
(C) 3, 1, 4, 2, 5
(D) 1, 3, 2, 4, 5

- 35. Adeel: All engineers are intelligent.
Bashir: That is not true. I know some bankers who are intelligent too.
Bashir's answer demonstrates that he thought Adeel meant that:**
- (A) Some engineers are intelligent
 - (B) bankers are more intelligent than engineers
 - (C) engineers are more intelligent than bankers
 - (D) only engineers are intelligent
- 36. Kamal is older than Jamal, Jamal is older than Hussain, and Hussain is older than Waqar. Who is the oldest?**
- (A) Waqar
 - (B) Jamal
 - (C) Kamal
 - (D) Hussain
- 37. Which one of the five words below would come first in a dictionary?**
- (A) Eliminate
 - (B) Dog
 - (C) Hen
 - (D) Parrot
- 38. A box contains 10 Red balls and 5 Blue balls. If two balls are selected at random without replacement, then what are the chances that both balls are red?**
- (A) $1/2$
 - (B) $1/3$
 - (C) $3/8$
 - (D) $3/7$
- 39. Identify the odd one out:**
- (A) Apple
 - (B) Banana
 - (C) Carrot
 - (D) Date
- 40. X and Y are two brothers, B is A's brother, but A is the mother of X. What is B to Y?**
- (A) Father
 - (B) Brother
 - (C) Son
 - (D) Uncle

Section III: Quantitative Reasoning (Questions 41-60)

41. 15% of 32 equals
- (A) 3.8
 - (B) 4.8
 - (C) 4
 - (D) 2.5
42. A number which is divisible by both 6 and 8 is also divisible by
- (A) 5
 - (B) 11
 - (C) 7
 - (D) 24
43. The circumference of a circle whose diameter is 6 inches is approximately
- (A) 16 inches
 - (B) 22 inches
 - (C) 38 inches
 - (D) 19 inches
44. If $2^a \times 2^b = 8^c$, then $(a + b)/c =$
- (A) 2
 - (B) 3
 - (C) 4
 - (D) 5
45. Successive discounts of 10% and 15% is equivalent to a single discount of
- (A) 22%
 - (B) 23.5%
 - (C) 25%
 - (D) 24%
46. The ratio from 5 feet to 3 inches is
- (A) $1/20$
 - (B) $3/60$
 - (C) $3/5$
 - (D) $5/3$
47. $3/4$ of 432 = ?

- (A) 316
(B) 340
(C) 324
(D) 232
48. If $x + 3y = 7$ and $2x + y = 5$ then x/y is?
(A) $8/9$
(B) $1/2$
(C) $1/3$
(D) $2/5$
49. If the radius of the circle is halved, then its area
(A) Remains same
(B) Becomes double
(C) Becomes half
(D) Becomes quarter
50. $0.027 \div 90 = ?$
(A) 0.03
(B) 0.00003
(C) 0.0003
(D) 0.3
51. If $3a - 5 = 3 + 2a$, then $a =$
(A) 10
(B) 6
(C) 9
(D) 8
52. If $3p + 2 = 12$, then $p - \frac{1}{3}$ equals:
(A) 12
(B) 10
(C) 4
(D) 3
53. The value of $\frac{0.54-0.44}{0.52-0.42}$ is?
(A) 0.9
(B) 0.31
(C) 0.09

- (D) 0.19
54. $1250 \div 25 \times 0.5 = ?$
- (A) 100
(B) 50
(C) 25
(D) 2.5
55. The area of the circle is 50π . The length of the diameter of the circle is
- (A) 8
(B) 16
(C) 4
(D) 32
56. The population of a city increased in two years from 25,000 to 30,000; find the percent increase during the time.
- (A) 5%
(B) 10%
(C) 20%
(D) 40%
57. If Adil can finish a job in 5 hours and Moeed can finish the same job in 10 hours, how many minutes will it take both of them together to finish the job?
- (A) 220
(B) 160
(C) 200
(D) 210
58. If $2x + y = 11$ and $3x + 2y = 17$ then y is?
- (A) 5
(B) 1
(C) 4
(D) 6
59. If $p = 2$, then $3^p + (p^3)^2 =$
- (A) 18
(B) 42
(C) 73

(D) 70

60. What is $1\frac{1}{5}\%$ of 5000?

(A) 10

(B) 1

(C) 16

(D) 5000

Section IV: Subject (Questions 61-90)

Note: This section contains 10 questions each from Physics (Q.61-70), Chemistry (Q.71-80), and Mathematics (Q.81-90).

Physics (Questions 61-70)

61. When the length of a microscope tube increases, its magnifying power

(A) Does not change

(B) Increases

(C) Decreases

(D) May increase or decrease

62. Ball pen functions on the principle of

(A) Viscosity

(B) Boyle's law

(C) Surface tension

(D) Gravitational force

63. The henry is the unit for

(A) Magnetic field

(B) Magnetic flux

(C) Resistance

(D) Inductance

64. If the metal bob in a simple pendulum is replaced by a wooden bob, then its time period will

(A) Decreases

(B) Remain the same

(C) First A then B

(D) Increases

- 65. If the earth were to rotate faster than its present speed, the weight of an object will**
- (A) Remain unchanged at the equator but increase at the poles
 - (B) Decrease at the equator but remain unchanged at the poles
 - (C) Increase at the equator but remain unchanged at the poles
 - (D) Remain unchanged at the equator but decrease at the poles
- 66. Bernoulli's equation is based upon law of conservation of**
- (A) Momentum
 - (B) Mass
 - (C) Energy
 - (D) None of these
- 67. With the increase of temperature, viscosity**
- (A) Remains same
 - (B) Decreases
 - (C) Increases
 - (D) Doubles
- 68. Which one of the following is a simple harmonic motion?**
- (A) Wave moving through a string fixed at both ends
 - (B) Particle moving in a circle with uniform speed
 - (C) Earth spinning about its own axis
 - (D) Ball bouncing between two rigid vertical walls
- 69. The volt/meter is the unit of:**
- (A) Force
 - (B) Work
 - (C) Potential
 - (D) Electric field Intensity
- 70. Choose the correct statement:**
- (A) An ammeter should have small resistance and a voltmeter should have large resistance
 - (B) An ammeter should have large resistance and a voltmeter should have small resistance
 - (C) Both an ammeter and a voltmeter should have large resistance
 - (D) Both an ammeter and voltmeter should have small resistance

Chemistry (Questions 71-80)

- 71. Vital force theory was rejected by**
- (A) Kolbe
 - (B) Wholer
 - (C) Lavoisier
 - (D) Berzelius
- 72. An electrolyte**
- (A) Gives ions only when dissolved in water
 - (B) Possesses ions even in solid state
 - (C) Gives ions only when electricity is passed
 - (D) Forms complex ions in solution
- 73. Hydrogen chloride molecule contains**
- (A) Electrovalent bond
 - (B) Double bond
 - (C) Co-ordinate bond
 - (D) Covalent bond
- 74. When electrons revolve in stationary orbits,**
- (A) There is no change in energy level
 - (B) They become stationary
 - (C) There is increase in energy
 - (D) They are gaining kinetic energy
- 75. Which of the following halogens does not form its oxyacids?**
- (A) I
 - (B) Br
 - (C) Cl
 - (D) F
- 76. The acid used in lead storage cells is**
- (A) Phosphoric acid
 - (B) Nitric acid
 - (C) Sulphuric acid
 - (D) Hydrochloric acid
- 77. Which one is not a pollutant normally?**
- (A) Carbon monoxide
 - (B) Sulphur dioxide

- (C) Hydrocarbons
(D) Carbon dioxide
- 78. The last orbit of argon would have electrons**
- (A) 6
(B) 18
(C) 8
(D) 2
- 79. Which of the following represents elements in order of increasing atomic size?**
- (A) Na, Mg, C
(B) C, N, O
(C) I, Br, Cl
(D) Li, Na, K
- 80. The number of electrons in the M shell of the element with atomic number 24 is**
- (A) 24
(B) 12
(C) 13
(D) 8

Mathematics (Questions 81-90)

- 81. The number of ways in which 5 distinct toys can be distributed among 3 children is**
- (A) P_3^5
(B) C_3^5
(C) 3^5
(D) 5^3
- 82. The multiplicative inverse of x such that $x = 0$ is**
- (A) $1/x$
(B) does not exist
(C) 0
(D) 1
- 83. In the expansion of $(a + b)^n$, in every term the sum of the exponents of a and b is**
- (A) n

- (B) $n + 1$
(C) $2n + 1$
(D) $2n - 1$
- 84. A point of a solution region where two of its boundary lines intersect, is called**
- (A) Boundary
(B) Half Plane
(C) Inequality
(D) Vertex
- 85. A line segment whose end points lie on a circle is called**
- (A) The chord of the circle
(B) The secant of the circle
(C) The arc of the circle
(D) The circumference of the circle
- 86. If the 19th term of A.P is 8 and the 4th term is 20, then the first term is**
- (A) 27.5
(B) 20.2
(C) 37.5
(D) 25.5
- 87. A vector of magnitude zero is called**
- (A) Position vector
(B) Null vector
(C) Free vector
(D) None of these
- 88. The center of a circle of radius 10 is at the origin. Which of the following points lies within the circle?**
- (A) (8, 8)
(B) (0, 10)
(C) (8, 4)
(D) (10, 0)
- 89. The constant distance of all points of the circle from its center is called the**
- (A) Diameter

- (B) Radius
- (C) Secant
- (D) Chord

90. The point $(-5, 3)$ is the center of a circle and $P(7, -2)$ lies on the circle. The radius of the circle is

- (A) 2
- (B) 8
- (C) 13
- (D) 7

ANSWER KEY - SAMPLE PAPER

Q	A	Q	A	Q	A	Q	A	Q	A
1	B	19	C	37	B	55	A	73	D
2	B	20	A	38	D	56	C	74	A
3	A	21	C	39	D	57	C	75	D
4	D	22	B	40	D	58	B	76	C
5	D	23	A	41	B	59	C	77	D
6	A	24	D	42	D	60	A	78	C
7	C	25	D	43	D	61	B	79	D
8	B	26	C	44	B	62	A	80	C
9	B	27	B	45	B	63	D	81	C
10	A	28	D	46	A	64	B	82	B
11	D	29	B	47	C	65	B	83	A
12	B	30	C	48	A	66	C	84	D
13	A	31	C	49	D	67	B	85	A
14	C	32	A	50	C	68	A	86	A
15	B	33	B	51	D	69	D	87	B
16	A	34	D	52	D	70	A	88	C
17	B	35	D	53	C	71	B	89	B
18	D	36	C	54	C	72	B	90	C

– END OF SAMPLE PAPER –

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Dear Candidate,

We hope this guide book has provided you with comprehensive preparation material for the Entry Test at National Textile University.

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National Textile University offers state-of-the-art facilities, experienced faculty, and excellent career opportunities in textile engineering, computer sciences, and emerging technologies. We look forward to receiving your application and welcoming you to our academic community.

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**Admissions Office
National Textile University, Faisalabad**

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