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NUMS 2021

ORIGINAL COMPLETE QUESTION PAPER

154	150m	No	4
Questions	Time Limit	Neg. Marking	Subjects

PHYSICS (40 Qs)	BIOLOGY (57 Qs)	ENGLISH (17 Qs)	CHEMISTRY (40 Qs)

EXAM INSTRUCTIONS

Exam	NUMS 2021 — National University of Medical Sciences
Questions	154 MCQs — Physics(40) Biology(57) English(17) Chemistry(40)
Time	150 minutes — No negative marking — Attempt ALL
NUMS Book	NUMS Entry Test Book by MbBs.Com.Pk | mbbs.com.pk/product/nums-book/
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NUMS 2021 PREP STRATEGY — Pakistan's #1 Free NUMS Resource	
Biology (55 Qs)	37%+ of paper. Cell bio, genetics, physiology, ecology. Every Bio mark = closer to seat.
Physics (40 Qs)	Mechanics, waves, electromagnetism, nuclear physics. Numericals = easy marks.
Chemistry (40 Qs)	Organic chemistry reactions = biggest scoring zone. Master mechanisms.
English (17 Qs)	Easiest 17 marks. 15 min daily grammar practice = near perfect score.
NUMS Book	27%+ of questions from NUMS Entry Test Book by MbBs.Com.Pk — order now.
MDCAT Book	Also order MDCAT Past Papers Book by MbBs.Com.Pk — 12-18% extra overlap.
Attempt Order	English (10 min) → Biology → Chemistry → Physics. Never leave blank.

SECTION 1 — PHYSICS (Q.1–Q.40)

Q1 **In isochoric process:**

A Pressure is kept constant
B Exchange of heat is zero
C Volume is kept constant
D Temperature is kept constant

Q2 **If 42J heat is transferred to system during expansion and work done is 32J, change in internal energy is:**

A 74 J
B 10 J
C 116 J
D 106 J

Q3 **The 1st law of thermodynamics is generalization of law of conservation of:**

A Mass
B Charge
C Energy
D Momentum

Q4 **RC = Resistance × Capacitance is known as:**

A Electrostatic constant
B Time constant
C Dielectric constant
D Proportionality constant

Q5 **In parallel combination of two capacitors, equivalent capacitance equals:**

A $C_1 + C_2$
B $1/C_1 + 1/C_2$
C $C_1C_2/(C_1+C_2)$
D $2C_1C_2/(C_1+C_2)$

Q6 **The S.I unit of capacitance is:**

A Coulomb
B Volt
C Farad
D Ampere

Q7 **1 kWh =**

A 0.36×10^6 J
B 36×10^5 J
C 3.6×10^6 J
D 0.036×10^5 J

Q8 **Volt × Ampere is the unit of:**

A Current
B Volt
C Resistance
D Power

Q9 **The time rate of change of velocity is called:**

A Force
B Acceleration
C Power
D Energy

Q10 **In projectile motion, range will be maximum at angle:**

A 30 degrees
B 45 degrees
C 60 degrees
D 90 degrees

Q11 **Which is NOT TRUE about momentum?**

A Momentum is quantity of motion
B Unit of momentum is N.s
C Momentum is NOT a vector quantity
D Momentum is product of mass and velocity

Q12 **In perfect elastic collision:**

A Only momentum conserved

B Only total energy conserved

C Only kinetic energy conserved

D Momentum, KE and total energy all conserved

Q13 **Slope of a displacement-time graph is:**

A Velocity

B Displacement

C Acceleration

D Distance

Q14 **Two stones 10kg and 50kg fall from 100m cliff. Which has greater velocity at bottom?**

A 10 Kg

B 50 Kg

C Both have same velocity

D Cannot be calculated

Q15 **Work done by gravity on 10N stone falling 250m:**

A 250 J

B 26 J

C 2,500 J

D 25,000 J

Q16 **Speed halved — kinetic energy decreases by factor:**

A 1/2

B 1/4

C 1/8

D 1/6

Q17 **Earth contracts to half size — gravitational PE becomes:**

A Double

B One-half

C Same

D Four times

Q18 **Product of force and velocity is:**

A Kinetic Energy

B Potential Energy

C Power

D Work done

Q19 One degree is equal to:

A 0.1 radian
B 0.15 radian
C 0.0175 radian
D 0.275 radian

Q20 Object on circular path r=1m covers 2m arc. Angular displacement:

A 1/2 rad
B 2 rad
C 3 rad
D 2/3 rad

Q21 Speed and radius both doubled — centripetal force becomes:

A Same
B Double
C 4 times
D 8 times

Q22 Relation between angular and linear velocity:

A $a = r\omega$
B $v = r\omega$
C $\omega = v/r^2$
D $v = \omega/r$

Q23 100 waves per second, wavelength 1cm — wave speed:

A 1 ms^{-1}
B 2 ms^{-1}
C 3 ms^{-1}
D 4 ms^{-1}

Q24 To make spring oscillation frequency 4 times, reduce mass to:

A One fourth
B Quadruple mass
C One sixteenth
D Double mass

Q25 Number of wavelengths per unit time is:

A Speed
B Velocity
C Displacement
D Frequency

Q26 Speed of sound 332 ms^{-1} at 0°C. Value at 10°C:

A 332 ms^{-1}
B 338.1 ms^{-1}
C 332.61 ms^{-1}
D 334.1 ms^{-1}

Q27 Cp - Cv = R shows that:

A Cv < Cp
B Cp = Cv
C Cp > Cv
D Cp = constant

Q28 Thermodynamic process with constant volume:

A Isothermal
B Isobaric
C Isochoric
D Adiabatic

Q29 2μF and 6μF capacitors in parallel — equivalent capacitance:

A 8μF
B 3/2μF
C 4μF
D 13/2μF

Q30 Capacitance of a capacitor does NOT depend upon:

A Temperature
B Separation between plates
C Medium
D Area of plates

Q31 Power transfer will be maximum when:

A R > r
B R < r
C R = r
D R = 1/r

Q32 **Wire radius halved — resistance becomes:**

A 4R
B R
C 6R
D 16R

Q33 **Charged particle enters magnetic field parallel — it will:**

A Deflect towards North
B Deflect towards South
C Move straight
D Move in circular path

Q34 **Magnetic flux is maximum when angle between field and area vector is:**

A 0°
B 90°
C 180°
D 45°

Q35 **Pakistan domestic electricity supply has frequency:**

A 70 Hz
B 50 Hz
C 100 Hz
D 30 Hz

Q36 **Device that increases or decreases EMF is called:**

A AC generator
B Motor
C Transformer
D DC generator

Q37 **Induced current opposes the cause that produces it. This is:**

A Ampere's Law
B Faraday's Law
C Lenz's Law
D Joule's Law

Q38 **The half-life of a radioactive substance is 20 minutes. After 1 hour, fraction remaining is:**

A 1/2
B 1/4
C 1/8
D 1/16

Q39 **Which of following has maximum penetrating power?**

A Alpha particles
B Beta particles
C Gamma rays
D X-rays

Q40 **The escape velocity from earth's surface is approximately:**

A 7.9 km/s

B 11.2 km/s

C 3.0 km/s

D 9.8 km/s

SECTION 2 — BIOLOGY (Q.41–Q.95)

Q41 **If fertilization occurs, young embryo is implanted into:**

A Epimetrium
B Perimetrium
C Myometrium
D Endometrium

Q42 **Sperms are produced in:**

A Vas deferens
B Collecting duct
C Epididymis
D Seminiferous tubules

Q43 **Gonadotropins are released by which gland?**

A Ovaries
B Hypothalamus
C Pituitary
D Testes

Q44 **Found at ends of long bones, nose, larynx and trachea:**

A Elastic cartilage
B Fibrous cartilage
C Perichondrium
D Hyaline cartilage

Q45 **Muscle with spontaneous contraction, many nuclei and no control over contraction:**

A Smooth muscle
B Cardiac muscle
C Skeletal muscle
D Visceral muscle

Q46 **Ball and Socket joint is present at:**

A Shoulder
B Wrist
C Elbow
D Knee

Q47 **Na^+ ions are nearly _____ times greater outside cell than inside:**

A 10
B 30
C 2
D 3

Q48 **Which hormone induces labour pains?**

A Estrogen
B Oxytocin
C Progesterone
D LH

Q49 **Hormone secreted due to decreased water content of blood:**

A ADH
B Oxytocin
C Glucagon
D Thyroxin

Q50 **Place of production of neurotransmitters:**

A Postsynaptic neuron
B Presynaptic neuron
C Synaptic cleft
D Dendrite

Q51 **Endorphins are produced in:**

A Brain
B Adrenal gland
C Stomach
D Thymus

Q52 **Hormone responsible for sperm production and male secondary sexual characteristics:**

A Estrogen
B Progesterone
C Testosterone
D Thyroxin

Q53 **Leydig cells are responsible for:**

A Testosterone production
B FSH production
C Sperm production
D Testosterone inhibition

Q54 **Estrogen secretion during oogenesis is stimulated by:**

A LH
B Inhibin
C FSH
D Testosterone

Q55 **Pituitary hormones regulating menstrual cycle:**

A FSH and estrogen
B LH and estrogen
C FSH and LH
D Estrogen and progesterone

Q56 **Trait transmitted from affected father to only his son:**

A Autosomal
B X-linked
C Y-linked
D X-Y linked

Q57 When both alleles of a gene pair are same, organism is:

A Heterozygous
B Genotype
C Homozygous
D Phenotype

Q58 Similar in function but different in structure — organs called:

A Analogous organs
B Homologous organs
C Convergent organs
D Divergent organs

Q59 NOT a mode of action of an antibody:

A Neutralizing antigen
B Precipitating antigen
C Secretion of cytokines
D Enhancing phagocytosis

Q60 Pepsinogen is converted into active pepsin by:

A Proteolytic enzyme
B Dissolving in mucus
C Hormonal action
D Hydrochloric acid

Q61 Which human body function is NOT controlled through negative feedback?

A Body temperature
B Glucagon production
C Labor contraction
D Parathyroid activity

Q62 **Grey matter of spinal cord does NOT contain:**

A Cell bodies of sensory neurons
B Cell bodies of interneurons
C Axons of interneurons
D Cell bodies of motor neurons

Q63 **Maximum temperature in enzyme action — enzymes:**

A Start to denature
B Start to re-nature
C Work best
D Are reactivated

Q64 **Feedback inhibition — enzyme inhibited by:**

A Product being produced
B Normal regulatory mechanism
C Unaffected by product
D Inhibited irreversibly

Q65 **Chemical that regulates enzymatic activity:**

A Activator
B Inhibitor
C Substrate
D Coenzyme

Q66 **Above optimum temperature, enzymatic activity decreases due to:**

A Saturation
B Inhibition
C Denaturation
D Composition

Q67 **NOT part of Darwin's theory of natural selection:**

A Organisms produce more offspring than environment supports
B Variation arises by gene mutation
C Only best adapted survive
D Individuals compete for resources

Q68 **Kiwi evolution, horse food, duck webbed feet — explained by:**

A Lamarck
B Darwin
C Weismann
D De Vries

Q69 **NOT TRUE about interferons:**

A Belong to cytokines
B Activate natural killer cells
C Activate immune cells
D Secrete interleukin

Q70 **Intrinsic factor from parietal cells helps in:**

A Vitamin B12 absorption
B Protein digestion
C Carbohydrate breakdown
D Bowel movement

Q71 **Major gastric juice production triggered by:**

A Taste sensation
B Smell of food
C Protein food in stomach
D Sight of food

Q72 **NOT a metabolic role of liver:**

A Glycogenolysis
B Gluconeogenesis
C Deamination
D Immunoglobulin synthesis

Q73 **Enzyme NOT produced by pancreas:**

A Lipase
B Trypsin
C Pepsin
D Amylase

Q74 **Heart chamber from where aorta originates:**

A Left ventricle
B Right ventricle
C Left atrium
D Right atrium

Q75 **Lymphatic system does NOT include:**

A Lymphoid masses
B Lymph vessels
C Spleen
D Lungs

Q76 **Protein in walls of alveoli:**

A Collagen
B Haemoglobin
C Myoglobin
D Myosin

Q77 **Natural bacterial flora beneficial because they:**

A Interfere with pathogenic colonization
B Develop resistance against antigens
C Resist physical agents
D Produce antibiotics

Q78 **Bacteria resistance against heat provided by:**

A Granules
B Cysts
C Spores
D Plasmids

Q79 **Cells most important for immunity:**

A Monocytes
B Neutrophils
C Lymphocytes
D Thrombocytes

Q80 **Digestion of which food starts from oral cavity?**

A Proteins
B Fats
C Carbohydrates
D Vitamins

Q81 **Vaccination is example of:**

A Natural passive immunity
B Natural active immunity
C Acquired/Artificial active immunity
D Acquired/Artificial passive immunity

SECTION 2 — BIOLOGY (continued)

Q82 Pubic symphysis and intervertebral disc are examples of:

A Fibrous joints
B Synovial joints
C Cartilaginous joints
D Gliding joints

Q83 Cartilage harder to heal than bone because it:

A Lacks vascular supply
B Lacks mineral deposits
C Has fewer cells
D Lacks protein

Q84 Feature absent from cardiac muscles:

A Intercalated disc
B Multinucleate cells
C Light and dark bands
D Contractile sarcomeres

Q85 Sarcoplasmic reticulum mainly responsible for:

A Calcium storage
B Protein synthesis
C Lipid metabolism
D Storing cell wastes

Q86 Junction between two neurons:

A Impulse
B Synapse
C Axon
D Cleft

Q87 Chemically a steroid hormone:

A ADH
B Thyroxin
C Cortisone
D Insulin

Q88 Parathyroid underactivity causes drop in blood:

A Mg^{2+}
B Na^{+}
C K^{+}
D Ca^{2+}

Q89 Protein establishing matrix of bone and cartilage:

A Elastin
B Keratin
C Collagen
D Histone

Q90 **Non-competitive inhibitors react at:**

A Allosteric site
B Active site
C Passive site
D Regulatory site

Q91 **Most enzymes work best at temperature:**

A 30°C
B 40°C
C 50°C
D 20°C

Q92 **Competitive inhibitors block substrate because they have:**

A Similar shape to substrate
B Different shape to substrate
C Higher molecular weight
D Stronger bonds

Q93 **When light falls on P-700, it is:**

A Induces photolysis
B Gains Hydrogen
C Accepts electrons
D Oxidised

Q94 **Products of light reaction used in dark reaction:**

A ATP and $NADP^+$
B ADP and $NADP^+$
C ADP and NADPM
D ATP and NADPH

Q95 **End products of light reactions of photosynthesis:**

A ATP and NADPH
B ATP and glucose
C Glucose and NADP
D ATP and water

Q96 **Smallest known bacteria belong to genus:**

A Mycoplasma
B Streptococcus
C Escherichia
D Bacillus

Q97 **Tonoplast is membrane separating:**

A Vacuole and Nucleoplasm
B Cytoplasm and Nucleoplasm
C Vacuole and Stroma
D Vacuole and Cytoplasm

SECTION 3 — ENGLISH (Q.96–Q.112)

Q98 I _____ English for five years.

A Study
B Am Studying
C Have been studying
D Studies

Q99 The soup _____ good.

A Taste
B Tastes
C Is tasting
D Has taste

Q100 Unless we _____ now, we cannot be on time.

A Start
B Will start
C Do not start
D Are starting

Q101 Daud is better than _____ of the college.

A All teachers
B Any teachers
C All other teachers
D Any teacher

Q102 Abide _____ the traffic laws for smooth and safe flow of traffic.

A On
B With
C By
D To

Q103 He prefers death _____ dishonor.

A Over
B On
C Upon
D To

Q104 What does the word 'SURPLUS' mean?

A In excess
B A mathematical term
C Within reach
D Salutation

Q105 What does the word 'SPILL' mean?

A Coil
B Deliver
C Spoil
D Spread

QUICK FACT | ENGLISH — The Easiest 17 Marks in NUMS

15+
Score in English

mdcatguide.com analysis shows students who scored **15+ in English** secured NUMS seats even with slightly lower Biology scores.

Grammar, prepositions and sentence correction repeat every year. **15 minutes daily = full 17 marks.**

Q106 What does the word 'CURIOUS' mean?

A Keen
B Careful
C Quest
D Cruel

Q107 Pick the sentence with correct punctuation:

A He had one motto "serving humanity."
B He, had one motto, serving humanity.
C He had one motto; serving humanity.
D He had one motto: serving humanity.

Q108 Pick the word with correct spelling:

A Collique
B Colleague
C Collegue
D Co-leageu

Q109 Pick the word with correct spelling:

A Acquaintance
B Equatance
C Equantence
D Equentense

Q110 Pick the word with correct spelling:

A Prayority
B Priarity
C Prioarily
D Priority

Q111 Pick the sentence with correct punctuation:

A "He did his best that was all anyone could do".
B He did his best, that was all anyone could do.
C He did his best: that was all anyone could do.
D He did his best; that was all anyone could do.

Q112 **Pick the correct option:**

A How has the chair leg broken?
B How has the leg of the chair broken?
C How the leg of the chair has broken?
D How the chair's leg is broken?

Q113 **The teacher asked the students _____ they had completed their homework.**

A that
B whether
C if that
D whether or not that

Q114 **Neither the students nor the teacher _____ present today.**

A are
B were
C was
D have been

SECTION 4 — CHEMISTRY (Q.113–Q.152)

Q115 **Vapor pressure is independent of:**

A Temperature
B Intermolecular forces
C Density of liquid
D Surface area of liquid

Q116 **Boiling point of ether less than alcohols due to:**

A Functional group
B Intermolecular forces
C Nature of alkyl groups
D Isomerism

Q117 **Ice cubes unite when pressed due to:**

A Dipole-dipole
B Covalent attraction
C Van Der Waal's forces
D H-bonding

Q118 **NaCl crystal: each Na^+ surrounded by:**

A 6 Cl^- and each Cl^- by 6 Na^+
B Face centred cubic only
C 3 Cl^- and 3 Na^+
D Intermolecular forces

Q119 **Greater lattice energy shown by:**

A NaCl
B NaBr
C NaI
D NaF

Q120 Thermal conductivity of metals due to:

A Layered structure
B Freely moving electrons
C Loosely held atoms
D Vibrational movement

Q121 200 atm pressure in Haber's process used for:

A Better yield
B Lower yield
C Lower rate
D Cost decrease

Q122 Equilibrium attained earlier by using:

A Temperature
B Pressure
C Concentration
D Catalyst

Q123 Temperature raised 10K — reaction rate increases to:

A Double
B Three times
C Four times
D Five times

Q124 Minimum energy for effective collisions:

A Activation energy
B Lattice energy
C Bond energy
D Hydration energy

Q125 Which is NOT a state function?

A Pressure (P)
B Work (W)
C Volume (V)
D Temperature (T)

Q126 $Mg^{2+}(g) + O^{2-}(g) \rightarrow MgO(s)$ represents:

A Atomization
B Neutralization
C Lattice energy
D Solution

Q127 When nitric oxide reacts with ozone, order of reaction is:

A 2nd
B 3rd
C 1st
D Zero

Q128 During electrolysis, reduction always occurs at:

A Anode
B Cathode
C SHE
D Salt bridge

Q129 Highest electronegativity of Fluorine due to:

A Complete outer shell
B Forms negative ion
C Diatomic molecule
D Smaller size and higher nuclear charge

Q130 VSEPR theory explains:

A Bond Energy
B Bond Length
C Shapes and Bond Energy
D Shapes

Q131 sp^3 hybridization is shown by:

A BF_3
B C_2H_4
C $BeCl_2$
D CH_4

Q132 Factor NOT affecting bond length:

A Multiple bonds
B Nature of hybridization
C Difference in electronegativity
D Ionization energies of bonded atoms

Q133 Malleable and ductile substance:

A Sodium chloride
B Copper sulphate
C Mercury
D Aluminum

Q134 Coordination number of Na in metallic BCC structure:

A 10
B 9
C 8
D 12

Q135 Cracking method for better quality gasoline:

A Thermal
B Catalytic
C Steam
D Radiations

Q136 Homocyclic organic compounds divided into:

A Alicyclic and Aromatic
B Open and branched chain
C Aromatic and non-aromatic
D Antiaromatic and antialicyclic

Q137 Acetophenone formed from benzene by:

A Alkylation
B Acylation
C Halogenation
D Nitration

Q138 Generic formula of cycloalkane is:

A CnH2n+2
B CnH2n
C CnH2n-1
D CnCH2n-2

Q139 Test that differentiates alcohol from phenol:

A Lucas test
B Halogenation
C Nitration
D Iodoform test

Q140 Order of reactivity of alcohol when C-O bond breaks:

A Tertiary > secondary > Primary
B Secondary > primary > tertiary
C Primary > secondary > tertiary
D Tertiary > primary > secondary

Q141 $C_nH_{2n}O$ is general formula of:

A Ether
B Carboxylic acid
C Ketones
D Carbolic acid

Q142 Catalytic reduction of aldehyde and ketone forms:

A Alcohol
B Carboxylic acid
C Alkane
D Aldehyde

Q143 Reacts with carboxylic acid to form ester:

A Aldehyde
B Alkyl Halide
C Ketones
D Alcohol

Q144 Hydrolysis of nitriles produces:

A Carboxylic acid
B Aldehydes
C Ketones
D Esters

Q145 Mass of sulphur in 24.5g of H_2SO_4:

A 32 g
B 24 g
C 16 g
D 8 g

Q146 Moles of NH_3 from 2.5 moles N_2 ($N_2+3H_2\rightarrow2NH_3$):

A 2.5 moles
B 2 moles
C 5 moles
D 7.5 moles

Q147 Quantum energy directly proportional to:

A Photon
B Wavelength
C Frequency
D Velocity

Q148 For l=2, total values of magnetic quantum number:

A 3
B 5
C 7
D 10

Q149 Total directions of f-orbitals in space:

A 5
B 3
C 7
D 6

Q150 NOT obtained from Schrödinger wave equation:

A Principal QN
B Spin QN
C Azimuthal QN
D Magnetic QN

Q151 Degenerate orbitals explained by:

A Aufbau Principle
B n+l Rule
C Hund's Rule
D Pauli Exclusion

Q152 Molecules in gases in constant movement — called:

A Kinetic theory of gases
B Crystal field theory
C Molecular orbital theory
D Transition state theory

Q153 SI unit of pressure:

A mm of Hg
B Pascal
C Bar
D Torr

Q154 Both temperature and volume doubled — pressure:

A Cannot be predicted
B Reduced to ½
C Remains unchanged
D Is doubled

QUICK ANSWER GRID — Check all answers at a glance

PHYSICS

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
C	B	C	B	A	C	C	D	B	B
Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20
C	D	A	C	C	B	A	C	C	B
Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30
B	B	A	C	D	B	C	C	A	A
Q31	Q32	Q33	Q34	Q35	Q36	Q37	Q38	Q39	Q40
C	D	C	A	B	C	C	C	C	B

BIOLOGY

Q41	Q42	Q43	Q44	Q45	Q46	Q47	Q48	Q49	Q50
D	D	C	D	B	A	A	B	A	B
Q51	Q52	Q53	Q54	Q55	Q56	Q57	Q58	Q59	Q60
A	C	A	C	C	C	C	A	C	D
Q61	Q62	Q63	Q64	Q65	Q66	Q67	Q68	Q69	Q70
C	C	A	A	B	C	B	A	D	A
Q71	Q72	Q73	Q74	Q75	Q76	Q77	Q78	Q79	Q80
C	D	C	A	D	A	A	C	C	C
Q81	Q82	Q83	Q84	Q85	Q86	Q87	Q88	Q89	Q90
C	C	A	B	A	B	C	D	C	A
Q91	Q92	Q93	Q94	Q95	Q96	Q97			
B	A	D	D	A	A	D			

ENGLISH

Q98	Q99	Q100	Q101	Q102	Q103	Q104	Q105	Q106	Q107
C	B	C	C	C	D	A	D	A	D
Q108	Q109	Q110	Q111	Q112	Q113	Q114			
B	A	D	D	B	B	C			

CHEMISTRY

Q115	Q116	Q117	Q118	Q119	Q120	Q121	Q122	Q123	Q124
D	B	D	A	D	B	A	D	A	A
Q125	Q126	Q127	Q128	Q129	Q130	Q131	Q132	Q133	Q134
B	C	A	B	D	D	D	D	D	C
Q135	Q136	Q137	Q138	Q139	Q140	Q141	Q142	Q143	Q144
B	A	B	B	A	A	C	A	D	A
Q145	Q146	Q147	Q148	Q149	Q150	Q151	Q152	Q153	Q154
D	C	C	B	C	B	C	A	B	C

COMPLETE ANSWER KEY WITH DETAILED EXPLANATIONS

SECTION 1 — PHYSICS (Q.1–Q.40)

Q1. In isochoric process:

Correct Answer: C. Volume is kept constant

Isochoric = constant volume (ΔV=0). No work done (W=0). All heat transfer changes internal energy only.

Q2. If 42J heat is transferred to system during expansion and work done is 32J, change in internal energy is:

Correct Answer: B. 10 J

ΔU = Q - W = 42 - 32 = 10 J. First Law of Thermodynamics.

Q3. The 1st law of thermodynamics is generalization of law of conservation of:

Correct Answer: C. Energy

First Law (ΔU = Q - W) is based on conservation of energy. Energy cannot be created or destroyed.

Q4. RC = Resistance × Capacitance is known as:

Correct Answer: B. Time constant

RC = time constant (τ). Time for capacitor to charge to 63.2% or discharge to 36.8%.

Q5. In parallel combination of two capacitors, equivalent capacitance equals:

Correct Answer: A. $C_1 + C_2$

Parallel: Ceq = $C_1 + C_2$. Series: 1/Ceq = $1/C_1 + 1/C_2$.

Q6. The S.I unit of capacitance is:

Correct Answer: C. Farad

Farad (F) = SI unit of capacitance. 1 F = 1 C/V. Named after Michael Faraday.

Q7. 1 kWh =

Correct Answer: C. 3.6×10^6 J

1 kWh = 1000 W × 3600 s = 3.6×10^6 J. Commercial electricity unit.

Q8. Volt × Ampere is the unit of:

Correct Answer: D. Power

V × A = Watt = Power. P = VI.

Q9. The time rate of change of velocity is called:

Correct Answer: B. Acceleration

Acceleration a = Δv/Δt. SI unit: m/s^2.

Q10. In projectile motion, range will be maximum at angle:

Correct Answer: B. 45 degrees

R = $v^2 \sin 2\theta / g$. Maximum when θ = 45°.

Q11. Which is NOT TRUE about momentum?

Correct Answer: C. Momentum is NOT a vector quantity

Momentum IS a vector quantity (p = mv). Direction matters.

Q12. In perfect elastic collision:

Correct Answer: D. Momentum, KE and total energy all conserved

Elastic collision: both momentum AND kinetic energy conserved.

Q13. Slope of a displacement-time graph is:

Correct Answer: A. Velocity

Slope of s-t graph = Δs/Δt = velocity.

Q14. Two stones 10kg and 50kg fall from 100m cliff. Which has greater velocity at bottom?

Correct Answer: C. Both have same velocity

$v = \sqrt{(2gh)}$. Independent of mass — both reach same velocity = 44.7 m/s.

Q15. Work done by gravity on 10N stone falling 250m:

Correct Answer: C. 2,500 J

$W = F \times h = 10N \times 250m = 2,500$ J.

Q16. Speed halved — kinetic energy decreases by factor:

Correct Answer: B. 1/4

$KE = \frac{1}{2}mv^2$. If $v \to v/2$: $KE_{new} = \frac{1}{2}m(v/2)^2 = KE/4$.

Q17. Earth contracts to half size — gravitational PE becomes:

Correct Answer: A. Double

$U = -GMm/r$. If $r \to r/2$: magnitude doubles.

Q18. Product of force and velocity is:

Correct Answer: C. Power

$P = F \cdot v$. Power = force × velocity.

Q19. One degree is equal to:

Correct Answer: C. 0.0175 radian

$1° = \pi/180 \approx 0.0175$ rad.

Q20. Object on circular path r=1m covers 2m arc. Angular displacement:

Correct Answer: B. 2 rad

$\theta = s/r = 2/1 = 2$ rad.

Q21. Speed and radius both doubled — centripetal force becomes:

Correct Answer: B. Double

$Fc = mv^2/r$. New $= m(2v)^2/(2r) = 2mv^2/r = 2Fc$. Doubles.

Q22. Relation between angular and linear velocity:

Correct Answer: B. $v = r\omega$

$v = r\omega$. Linear velocity = radius × angular velocity.

Q23. 100 waves per second, wavelength 1cm — wave speed:

Correct Answer: A. 1 ms^{-1}

$v = f\lambda = 100 \times 0.01 = 1$ m/s.

Q24. To make spring oscillation frequency 4 times, reduce mass to:

Correct Answer: C. One sixteenth

$f \propto 1/\sqrt{m}$. For f→4f: m → m/16.

Q25. Number of wavelengths per unit time is:

Correct Answer: D. Frequency

Frequency = complete waves per second.

Q26. Speed of sound 332 ms^{-1} at 0°C. Value at 10°C:

Correct Answer: B. 338.1 ms^{-1}

$v = 332 + 0.61 \times 10 = 338.1$ ms^{-1}.

Q27. Cp - Cv = R shows that:

Correct Answer: C. Cp > Cv

Cp - Cv = R > 0, therefore Cp > Cv.

Q28. Thermodynamic process with constant volume:

Correct Answer: C. Isochoric

Isochoric = constant volume. No work done.

Q29. 2μF and 6μF capacitors in parallel — equivalent capacitance:

Correct Answer: A. 8μF

Parallel: Ceq = 2 + 6 = 8μF.

Q30. Capacitance of a capacitor does NOT depend upon:

Correct Answer: A. Temperature

$C = \varepsilon A/d$. Independent of temperature.

Q31. Power transfer will be maximum when:

Correct Answer: C. R = r

Maximum power transfer: external R = internal resistance r.

Q32. Wire radius halved — resistance becomes:

Correct Answer: D. 16R

Volume conserved → L' = 4L, A' = A/4. R' = 16R.

Q33. Charged particle enters magnetic field parallel — it will:

Correct Answer: C. Move straight

$F = qv \times B = 0$ when v parallel to B. Moves straight.

Q34. Magnetic flux is maximum when angle between field and area vector is:

Correct Answer: A. 0°

$\Phi = BA\cos\theta$. Max at $\theta = 0°$.

Q35. Pakistan domestic electricity supply has frequency:

Correct Answer: B. 50 Hz

Pakistan uses 50 Hz AC (same as most of Asia and Europe).

Q36. Device that increases or decreases EMF is called:

Correct Answer: C. Transformer

Transformer steps up or steps down AC voltage via mutual induction.

Q37. Induced current opposes the cause that produces it. This is:

Correct Answer: C. Lenz's Law

Lenz's Law: conservation of energy — induced current opposes change.

Q38. The half-life of a radioactive substance is 20 minutes. After 1 hour, fraction remaining is:

Correct Answer: C. 1/8

1 hour = 3 half-lives. Fraction = $(1/2)^3 = 1/8$.

Q39. Which of following has maximum penetrating power?

Correct Answer: C. Gamma rays

Gamma rays have maximum penetrating power — can pass through several cm of lead.

Q40. The escape velocity from earth's surface is approximately:

Correct Answer: B. 11.2 km/s

Escape velocity = $\sqrt{(2gR)} = \sqrt{(2\times9.8\times6.4\times10^6)} \approx 11.2$ km/s.

SECTION 2 — BIOLOGY (Q.41–Q.95)

Q41. If fertilization occurs, young embryo is implanted into:

Correct Answer: D. Endometrium

Embryo implants into endometrium (inner uterine lining) around day 6-10 after fertilization.

Q42. Sperms are produced in:

Correct Answer: D. Seminiferous tubules

Spermatogenesis occurs in seminiferous tubules. Sperm mature in epididymis.

Q43. Gonadotropins are released by which gland?

Correct Answer: C. Pituitary

FSH and LH (gonadotropins) released by anterior pituitary gland.

Q44. Found at ends of long bones, nose, larynx and trachea:

Correct Answer: D. Hyaline cartilage

Hyaline cartilage: articular surfaces, tracheal rings, nose, larynx.

Q45. Muscle with spontaneous contraction, many nuclei and no control over contraction:

Correct Answer: B. Cardiac muscle

Cardiac muscle: involuntary, branched, intercalated discs, autorhythmic.

Q46. Ball and Socket joint is present at:

Correct Answer: A. Shoulder

Shoulder (and hip) = ball and socket joints. Allow movement in all directions.

Q47. Na^+ ions are nearly _____ times greater outside cell than inside:

Correct Answer: A. 10

[Na^+] outside ~145 mEq/L, inside ~15 mEq/L = ~10× gradient.

Q48. Which hormone induces labour pains?

Correct Answer: B. Oxytocin

Oxytocin from posterior pituitary stimulates uterine contractions.

Q49. Hormone secreted due to decreased water content of blood:

Correct Answer: A. ADH

ADH released when blood osmolarity rises → kidneys reabsorb water.

Q50. Place of production of neurotransmitters:

Correct Answer: B. Presynaptic neuron

Neurotransmitters synthesized in presynaptic neuron terminals.

Q51. Endorphins are produced in:

Correct Answer: A. Brain

Endorphins produced in hypothalamus and pituitary gland.

Q52. Hormone responsible for sperm production and male secondary sexual characteristics:

Correct Answer: C. Testosterone

Testosterone from Leydig cells drives spermatogenesis and secondary characteristics.

Q53. Leydig cells are responsible for:

Correct Answer: A. Testosterone production

Leydig (interstitial) cells produce testosterone under LH stimulation.

Q54. Estrogen secretion during oogenesis is stimulated by:

Correct Answer: C. FSH

FSH stimulates follicle development and estrogen secretion from granulosa cells.

Q55. Pituitary hormones regulating menstrual cycle:

Correct Answer: C. FSH and LH

FSH and LH from anterior pituitary regulate the full menstrual cycle.

Q56. Trait transmitted from affected father to only his son:

Correct Answer: C. Y-linked

Y-linked (holandric) traits: father → ALL sons via Y chromosome.

Q57. When both alleles of a gene pair are same, organism is:

Correct Answer: C. Homozygous

Homozygous = identical alleles (AA or aa).

Q58. Similar in function but different in structure — organs called:

Correct Answer: A. Analogous organs

Analogous = same function, different evolutionary origin. Convergent evolution.

Q59. NOT a mode of action of an antibody:

Correct Answer: C. Secretion of cytokines

Cytokines secreted by T-cells/macrophages, NOT antibodies.

Q60. Pepsinogen is converted into active pepsin by:

Correct Answer: D. Hydrochloric acid

HCl from parietal cells converts pepsinogen → active pepsin.

Q61. Which human body function is NOT controlled through negative feedback?

Correct Answer: C. Labor contraction

Labor uses positive feedback (oxytocin cycle). Others use negative feedback.

Q62. Grey matter of spinal cord does NOT contain:

Correct Answer: C. Axons of interneurons

Axons are in white matter. Grey matter contains cell bodies only.

Q63. Maximum temperature in enzyme action — enzymes:

Correct Answer: A. Start to denature

Maximum temperature = denaturation threshold. Activity drops sharply.

Q64. Feedback inhibition — enzyme inhibited by:

Correct Answer: A. Product being produced

Feedback inhibition: end product inhibits first enzyme of pathway.

Q65. Chemical that regulates enzymatic activity:

Correct Answer: B. Inhibitor

Inhibitors regulate enzyme activity by slowing or stopping reactions.

Q66. Above optimum temperature, enzymatic activity decreases due to:

Correct Answer: C. Denaturation

High heat breaks weak bonds → enzyme denatures → inactive.

Q67. NOT part of Darwin's theory of natural selection:

Correct Answer: B. Variation arises by gene mutation

Darwin didn't know about genes — Mendel's genetics integrated later in Modern Synthesis.

Q68. Kiwi evolution, horse food, duck webbed feet — explained by:

Correct Answer: A. Lamarck

Lamarck explained these vestigial and acquired characteristic examples in detail.

Q69. NOT TRUE about interferons:

Correct Answer: D. Secrete interleukin

Interferons are cytokines but don't secrete interleukins — separate category.

Q70. Intrinsic factor from parietal cells helps in:

Correct Answer: A. Vitamin B12 absorption

Intrinsic factor binds vitamin B12, enabling its absorption in ileum.

Q71. Major gastric juice production triggered by:

Correct Answer: C. Protein food in stomach

Gastric phase (food in stomach) = ~70% of gastric juice produced.

Q72. NOT a metabolic role of liver:

Correct Answer: D. Immunoglobulin synthesis

Immunoglobulins made by plasma B-cells, not liver.

Q73. Enzyme NOT produced by pancreas:

Correct Answer: C. Pepsin

Pepsin made by chief cells of stomach. Pancreas: lipase, trypsinogen, amylase.

Q74. Heart chamber from where aorta originates:

Correct Answer: A. Left ventricle

Aorta originates from LEFT VENTRICLE. Pulmonary artery from right ventricle.

Q75. Lymphatic system does NOT include:

Correct Answer: D. Lungs

Lungs = respiratory system. Not part of lymphatic system.

Q76. Protein in walls of alveoli:

Correct Answer: A. Collagen

Collagen and elastin form alveolar walls — structural support and elasticity.

Q77. Natural bacterial flora beneficial because they:

Correct Answer: A. Interfere with pathogenic colonization

Normal flora competes with pathogens for nutrients and attachment sites.

Q78. Bacteria resistance against heat provided by:

Correct Answer: C. Spores

Bacterial endospores resist extreme heat including boiling.

Q79. Cells most important for immunity:

Correct Answer: C. Lymphocytes

Lymphocytes (B-cells and T-cells) = primary immune cells.

Q80. Digestion of which food starts from oral cavity?

Correct Answer: C. Carbohydrates

Salivary amylase begins carbohydrate digestion in the mouth.

Q81. Vaccination is example of:

Correct Answer: C. Acquired/Artificial active immunity

Vaccination = artificial active immunity — body makes antibodies to introduced antigen.

Q82. Pubic symphysis and intervertebral disc are examples of:

Correct Answer: C. Cartilaginous joints

Cartilaginous joints: slightly movable, joined by fibrocartilage.

Q83. Cartilage harder to heal than bone because it:

Correct Answer: A. Lacks vascular supply

Cartilage is avascular — no blood vessels for repair supply.

Q84. Feature absent from cardiac muscles:

Correct Answer: B. Multinucleate cells

Cardiac muscle cells are UNINUCLEATE. Skeletal muscle is multinucleate.

Q85. Sarcoplasmic reticulum mainly responsible for:

Correct Answer: A. Calcium storage

SR stores and releases Ca^{2+} which triggers muscle contraction.

Q86. Junction between two neurons:

Correct Answer: B. Synapse

Synapse = junction between two neurons.

Q87. Chemically a steroid hormone:

Correct Answer: C. Cortisone

Cortisone is derived from cholesterol — a steroid hormone.

Q88. Parathyroid underactivity causes drop in blood:

Correct Answer: D. Ca^{2+}

PTH raises blood Ca^{2+}. Underactivity → hypocalcemia.

Q89. Protein establishing matrix of bone and cartilage:

Correct Answer: C. Collagen

Collagen Type I = bone; Type II = cartilage matrix.

Q90. Non-competitive inhibitors react at:

Correct Answer: A. Allosteric site

Non-competitive inhibitors bind allosteric site → change enzyme shape.

Q91. Most enzymes work best at temperature:

Correct Answer: B. 40°C

Human enzymes optimal at ~37–40°C.

Q92. Competitive inhibitors block substrate because they have:

Correct Answer: A. Similar shape to substrate

Competitive inhibitors mimic substrate shape and compete for active site.

Q93. When light falls on P-700, it is:

Correct Answer: D. Oxidised

P-700 (PSI) absorbs light → oxidized, loses electron to $NADP^+$.

Q94. Products of light reaction used in dark reaction:

Correct Answer: D. ATP and NADPH

ATP and NADPH from light reactions used in Calvin cycle.

Q95. End products of light reactions of photosynthesis:

Correct Answer: A. ATP and NADPH

Light reactions produce: ATP, NADPH, and O_2.

Q96. Smallest known bacteria belong to genus:

Correct Answer: A. Mycoplasma

Mycoplasma (0.2–0.3 µm) = smallest bacteria. No cell wall.

Q97. Tonoplast is membrane separating:

Correct Answer: D. Vacuole and Cytoplasm

Tonoplast = membrane surrounding central vacuole.

SECTION 3 — ENGLISH (Q.96–Q.112)

Q98. I _____ English for five years.

Correct Answer: C. Have been studying

Present Perfect Continuous: action started in past, continues to present. 'For five years' = duration.

Q99. The soup _____ good.

Correct Answer: B. Tastes

Stative verb 'taste' → simple present. Singular subject → 'tastes'.

Q100. Unless we _____ now, we cannot be on time.

Correct Answer: C. Do not start

'Unless' = 'if not'. 'Unless we do not start' is correct conditional.

Q101. Daud is better than _____ of the college.

Correct Answer: C. All other teachers

'Better than all other teachers' — need 'other' since Daud is included in 'all teachers'.

Q102. Abide _____ the traffic laws for smooth and safe flow of traffic.

Correct Answer: C. By

'Abide by' = comply with/follow rules. Fixed phrasal verb.

Q103. He prefers death _____ dishonor.

Correct Answer: D. To

'Prefer...to' is correct construction in formal English.

Q104. What does the word 'SURPLUS' mean?

Correct Answer: A. In excess

Surplus = excess amount left over when requirements are met.

Q105. What does the word 'SPILL' mean?

Correct Answer: D. Spread

Spill = to cause liquid to flow over edge; to spread out.

Q106. What does the word 'CURIOUS' mean?

Correct Answer: A. Keen

Curious = eager to know or learn. Synonyms: inquisitive, keen.

Q107. Pick the sentence with correct punctuation:

Correct Answer: D. He had one motto: serving humanity.

Colon (:) introduces explanations or examples. 'One motto: serving humanity' correct.

Q108. Pick the word with correct spelling:

Correct Answer: B. Colleague

Colleague = col + league. A person one works with professionally.

Q109. Pick the word with correct spelling:

Correct Answer: A. Acquaintance

Acquaintance — contains 'cqu'. Person known slightly.

Q110. Pick the word with correct spelling:

Correct Answer: D. Priority

Priority — correct spelling with -ior-.

Q111. Pick the sentence with correct punctuation:

Correct Answer: D. He did his best; that was all anyone could do.

Semicolon separates two independent clauses correctly.

Q112. Pick the correct option:

Correct Answer: B. How has the leg of the chair broken?

'How has the leg of the chair broken?' — correct auxiliary verb placement.

Q113. The teacher asked the students _____ they had completed their homework.

Correct Answer: B. whether

Indirect question with 'asked' uses 'whether' or 'if'. 'Whether' is more formal.

Q114. Neither the students nor the teacher _____ present today.

Correct Answer: C. was

Neither...nor: verb agrees with subject nearest to verb. 'Teacher' is singular → 'was'.

SECTION 4 — CHEMISTRY (Q.113–Q.152)

Q115. Vapor pressure is independent of:

Correct Answer: D. Surface area of liquid

Vapor pressure depends on T and intermolecular forces, NOT surface area.

Q116. Boiling point of ether less than alcohols due to:

Correct Answer: B. Intermolecular forces

Ethers: no H-bonding with itself → weaker forces → lower boiling point.

Q117. Ice cubes unite when pressed due to:

Correct Answer: D. H-bonding

Pressure melts ice, then H-bonds reform when pressure removed → cubes unite.

Q118. NaCl crystal: each Na^+ surrounded by:

Correct Answer: A. 6 Cl^- and each Cl^- by 6 Na^+

NaCl: each Na^+ by 6 Cl^-; each Cl^- by 6 Na^+. Coordination number = 6.

Q119. Greater lattice energy shown by:

Correct Answer: D. NaF

NaF: F^- smallest halide → strongest attraction → highest lattice energy.

Q120. Thermal conductivity of metals due to:

Correct Answer: B. Freely moving electrons

Free/delocalized electrons carry thermal energy rapidly through metal lattice.

Q121. 200 atm pressure in Haber's process used for:

Correct Answer: A. Better yield

High pressure favors product side ($N_2+3H_2 \rightarrow 2NH_3$ fewer moles) → better yield.

Q122. Equilibrium attained earlier by using:

Correct Answer: D. Catalyst

Catalyst lowers Ea → speeds both reactions → equilibrium reached faster.

Q123. Temperature raised 10K — reaction rate increases to:

Correct Answer: A. Double

Rate approximately doubles per 10°C rise — standard kinetics rule.

Q124. Minimum energy for effective collisions:

Correct Answer: A. Activation energy

Activation energy (Ea) = minimum energy required for reaction to occur.

Q125. Which is NOT a state function?

Correct Answer: B. Work (W)

Work (W) is path-dependent. P, V, T are state functions.

Q126. $Mg^{2+}(g) + O^{2-}(g) \rightarrow MgO(s)$ represents:

Correct Answer: C. Lattice energy

Gaseous ions → solid ionic lattice = lattice energy (exothermic).

Q127. When nitric oxide reacts with ozone, order of reaction is:

Correct Answer: A. 2nd

Rate = k[NO][O_3]. First order each, overall 2nd order.

Q128. During electrolysis, reduction always occurs at:

Correct Answer: B. Cathode

RED CAT: Reduction at Cathode. AN OX: Anode = Oxidation.

Q129. Highest electronegativity of Fluorine due to:

Correct Answer: D. Smaller size and higher nuclear charge

Fluorine: smallest radius + highest nuclear charge in period → strongest electron pull.

Q130. VSEPR theory explains:

Correct Answer: D. Shapes

VSEPR predicts molecular shapes by minimizing electron pair repulsions.

Q131. sp^3 hybridization is shown by:

Correct Answer: D. CH_4

CH_4: carbon 4 single bonds → sp^3. Tetrahedral geometry, 109.5°.

Q132. Factor NOT affecting bond length:

Correct Answer: D. Ionization energies of bonded atoms

Ionization energy doesn't directly affect bond length.

Q133. Malleable and ductile substance:

Correct Answer: D. Aluminum

Aluminum = metal → malleable and ductile. Ionic compounds are brittle.

Q134. Coordination number of Na in metallic BCC structure:

Correct Answer: C. 8

BCC metallic Na: each atom touches 8 neighbors. Coordination number = 8.

Q135. Cracking method for better quality gasoline:

Correct Answer: B. Catalytic

Catalytic cracking (zeolite) produces higher octane gasoline.

Q136. Homocyclic organic compounds divided into:

Correct Answer: A. Alicyclic and Aromatic

Homocyclic: only C in ring. Two types: Alicyclic and Aromatic.

Q137. Acetophenone formed from benzene by:

Correct Answer: B. Acylation

Friedel-Crafts acylation: C_6H_6 + CH_3COCl → $C_6H_5COCH_3$.

Q138. Generic formula of cycloalkane is:

Correct Answer: B. CnH2n

Cycloalkanes: C_nH_{2n} (one degree of unsaturation from ring).

Q139. Test that differentiates alcohol from phenol:

Correct Answer: A. Lucas test

Lucas test reacts with alcohols but NOT phenols.

Q140. Order of reactivity of alcohol when C-O bond breaks:

Correct Answer: A. Tertiary > secondary > Primary

C-O cleavage: 3° > 2° > 1°. Tertiary carbocations most stable.

Q141. $C_nH_{2n}O$ is general formula of:

Correct Answer: C. Ketones

Ketones and aldehydes: $C_nH_{2n}O$. Carboxylic acids: $C_nH_{2n}O_2$.

Q142. Catalytic reduction of aldehyde and ketone forms:

Correct Answer: A. Alcohol

H_2/Ni: Aldehyde → Primary alcohol; Ketone → Secondary alcohol.

Q143. Reacts with carboxylic acid to form ester:

Correct Answer: D. Alcohol

RCOOH + R'OH → RCOOR' + H_2O. Fischer esterification.

Q144. Hydrolysis of nitriles produces:

Correct Answer: A. Carboxylic acid

R-CN + $2H_2O$ → R-COOH + NH_3.

Q145. Mass of sulphur in 24.5g of H_2SO_4:

Correct Answer: D. 8 g

Moles H_2SO_4 = 24.5/98 = 0.25 mol. Mass S = 0.25 × 32 = 8g.

Q146. Moles of NH_3 from 2.5 moles N_2 ($N_2+3H_2\rightarrow2NH_3$):

Correct Answer: C. 5 moles

1 mol N_2 → 2 mol NH_3. 2.5 mol N_2 → 5 mol NH_3.

Q147. Quantum energy directly proportional to:

Correct Answer: C. Frequency

E = hf (Planck). Energy ∝ frequency.

Q148. For l=2, total values of magnetic quantum number:

Correct Answer: B. 5

m = -l to +l. For l=2: m = -2,-1,0,1,2 → 5 values.

Q149. Total directions of f-orbitals in space:

Correct Answer: C. 7

f orbitals: l=3, m = -3 to +3 → 7 orientations.

Q150. NOT obtained from Schrödinger wave equation:

Correct Answer: B. Spin QN

Spin QN (ms = ±½) introduced separately by Pauli. Not from Schrödinger.

Q151. Degenerate orbitals explained by:

Correct Answer: C. Hund's Rule

Hund's rule: fill degenerate orbitals singly with parallel spins before pairing.

Q152. Molecules in gases in constant movement — called:

Correct Answer: A. Kinetic theory of gases

Kinetic molecular theory: gas molecules in constant random motion.

Q153. SI unit of pressure:

Correct Answer: B. Pascal

Pascal (Pa) = SI unit. 1 Pa = 1 N/m².

Q154. Both temperature and volume doubled — pressure:

Correct Answer: C. Remains unchanged

PV/T = const. $P_2 = P_1 \times (V/2V) \times (2T/T) = P_1$. Unchanged.

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