Sample Questions For Class XI (SEM 1)

Subjects: **Physics, Chemistry, Mathematics, Biology**

Total No. of Questions: **50**

***each of the questions will carry 2 marks.**

****** no marks will be deducted for wrong answer.**

Duration of the Exam: **1hr**

***each of the students will be provided a QUESTION- ANSWER BOOKLET where they will answer and submit to the invigilator at the end.**

PHYSICS (MCQs)

SEC- A

1. A particle moves such that x=t3−3t2+2tx = t^3 - 3t^2 + 2tx=t3−3t2+2t. Its acceleration at t=2t=2t=2 is:
   A) 0
   B) 2
   C) 6
   D) 12 ✅

2. A body projected vertically upwards returns to ground. The ratio of time of ascent to descent is:
   A) 1:1 ✅
   B) 1:2
   C) 2:1
   D) Depends on mass

3. Dimensional formula of gravitational constant GGG:
   A) M−1L3T−2M^{-1}L^3T^{-2}M−1L3T−2 ✅
   B) ML−2T−2ML^{-2}T^{-2}ML−2T−2
   C) M0L3T−2M^0L^3T^{-2}M0L3T−2
   D) ML2T−2ML^2T^{-2}ML2T−2

4. A car accelerates uniformly from 10 m/s to 20 m/s in 5 s. Distance covered:
   A) 75 m ✅
   B) 50 m
   C) 100 m
   D) 125 m

5. If force is doubled and mass is halved, acceleration becomes:
   A) Same
   B) Double
   C) Four times ✅
   D) Half

6. Work done by centripetal force in circular motion:
   A) Maximum
   B) Minimum
   C) Zero ✅
   D) Infinite

7. Two vectors of magnitude 3 and 4 have resultant 5. Angle between them:
   A) 0°
   B) 60°
   C) 90° ✅
   D) 120°

8. Escape velocity depends on:
   A) Mass only
   B) Radius only
   C) Both mass & radius ✅
   D) Neither

9. If velocity-time graph is straight line, motion is:
   A) Uniform
   B) Uniformly accelerated ✅
   C) Retarded
   D) Random

10. A body falls freely. Its velocity after 3 s (g=10):
    A) 20 m/s
    B) 25 m/s
    C) 30 m/s ✅
    D) 35 m/s

11. Angular velocity unit:
    A) rad/s ✅
    B) m/s
    C) s^{-1}
    D) both A & C ✅

12. A projectile has maximum range when angle is:
    A) 30°
    B) 45° ✅

C) 60°
D) 90°

13. If kinetic energy is doubled, velocity becomes:
A) √2 times ✔
B) 2 times
C) 4 times
D) Same

14. A satellite orbit period depends on:
A) Mass of satellite
B) Radius of orbit ✔
C) Velocity
D) Shape

15. Torque =
A) Force × distance ✔
B) Work/time
C) Mass × velocity
D) Energy/time

SEC- B

1. The SI unit of force is:
A) Joule
B) Watt
C) Newton
D) Pascal
Ans: C

2. Velocity is a:
A) Scalar
B) Vector
C) Constant
D) Unit
Ans: B

3. Acceleration due to gravity on Earth is approximately:
A) 8 m/s²
B) 9.8 m/s²
C) 10.8 m/s²
D) 7.8 m/s²
Ans: B

4. Work done is zero when:
A) Force is applied
B) Displacement is zero
C) Velocity is high
D) Mass is large
Ans: B

5. Unit of power is:
A) Joule
B) Newton
C) Watt
D) Volt
Ans: C

6. Momentum is equal to:
A) m/v
B) m×v
C) v/m
D) m+v
Ans: B

7. 1 Joule =
A) 1 N/m
B) 1 Nm
C) 1 kg m
D) 1 m/s
Ans: B

8. The speed of light is:
A) 3×10^6 m/s
B) 3×10^8 m/s
C) 3×10^5 m/s
D) 3×10^7 m/s
Ans: B

9. Which law explains inertia?
A) Newton's First Law
B) Newton's Second Law
C) Newton's Third Law
D) Ohm's Law
Ans: A

10. Pressure =
A) Force × Area
B) Force / Area
C) Area / Force
D) Mass / Volume
Ans: B

11. Frequency unit is:
A) Hertz
B) Newton
C) Joule
D) Watt
Ans: A

12. Density =
A) Mass × Volume
B) Mass / Volume
C) Volume / Mass
D) Weight / Volume
Ans: B

13. SI unit of current:
A) Volt
B) Ohm
C) Ampere
D) Watt
Ans: C

14. Energy stored in a body due to motion:
A) Potential Energy
B) Kinetic Energy
C) Chemical Energy
D) Heat Energy
Ans: B

15. Mirror used in vehicles:
A) Concave
B) Convex
C) Plane
D) Cylindrical
Ans: B

CHEMISTRY (MCQs)

1. Atomic number represents:
A) Neutrons
B) Protons
C) Electrons + Neutrons
D) Mass
Ans: B

2. pH value of neutral solution:
A) 0
B) 14
C) 7
D) 1
Ans: C

3. H_2O is:
A) Element
B) Compound
C) Mixture
D) Alloy
Ans: B

4. Valency of oxygen:
A) 1
B) 2
C) 3
D) 4
Ans: B

5. NaCl is:
A) Acid
B) Base
C) Salt
D) Metal
Ans: C

6. Avogadro number is:
A) 6.023×10^{23}
B) 6.022×10^{23}
C) 6.002×10^{23}
D) 6.032×10^{23}
Ans: B

7. The gas used in photosynthesis:
A) O_2
B) CO_2
C) N_2
D) H_2
Ans: B

8. Strong acid:
A) HCl
B) CH_3COOH
C) NH_4OH
D) NaOH
Ans: A

9. Atomic mass unit is:
A) amu
B) gm
C) kg
D) mol
Ans: A

10. Periodic table was developed by:
A) Dalton
B) Rutherford
C) Mendeleev
D) Bohr
Ans: C

11. Oxidation is:
A) Gain of electrons
B) Loss of electrons
C) Gain of protons

D) Loss of neutrons
Ans: B

12. Noble gas:
A) Oxygen
B) Nitrogen
C) Helium
D) Hydrogen
Ans: C

13. Chemical formula of ammonia:
A) NH_3
B) NO_2
C) NH_2
D) N_2H
Ans: A

14. Unit of molarity:
A) mol/kg
B) mol/L
C) kg/mol
D) L/mol
Ans: B

15. Catalyst:
A) Reactant
B) Product
C) Speeds up reaction
D) Slows reaction
Ans: C

16. Number of moles in 44 g CO_2:
A) 1 ✓
B) 2
C) 0.5
D) 44

17. Which has highest electronegativity?
A) F ✓
B) Cl
C) O
D) N

18. Hybridization in methane (CH_4):
A) sp
B) sp^2
C) sp^3 ✓
D) dsp^2

19. Shape of BF_3:
A) Linear
B) Trigonal planar ✓
C) Tetrahedral
D) Octahedral

20. Oxidation number of S in H_2SO_4:
A) +4
B) +6 ✓
C) -2
D) 0

21. pH of strong acid is:
A) <7 ✓
B) >7
C) =7
D) 14

22. Number of atoms in 1 mole:
A) Avogadro number ✓
B) 1
C) 100
D) 10^{23}

23. Ionization energy increases across period because:
A) Atomic size decreases ✓
B) Size increases
C) Shielding increases
D) Mass increases

24. Bond angle in NH_3:
A) 109.5°
B) 107° ✓
C) 120°
D) 180°

25. Strongest bond:
A) Single
B) Double
C) Triple ✓
D) Ionic

26. Which is polar?
A) CO_2
B) H_2O ✓

C) CH_4
D) O_2

27. Boyle's law:
A) PV = constant ✅
B) V/T
C) P/T
D) PV/T

28. Which is reducing agent?
A) Loses electrons ✅
B) Gains electrons
C) Neutral
D) None

29. Atomic radius trend:
A) Decreases across period ✅
B) Increases
C) Same
D) Random

30. Mole fraction sum:
A) 1 ✅
B) 0
C) 100
D) ∞

🌿 BIOLOGY (10 MCQs)

1. Fluid mosaic model proposed by:
A) Singer & Nicolson ✅
B) Watson
C) Mendel
D) Darwin
2. Powerhouse of cell:
A) Mitochondria ✅
B) Ribosome
C) Nucleus
D) ER
3. Enzyme action depends on:
A) Temperature & pH ✅
B) Light
C) Pressure
D) Size
4. DNA replication is:
A) Semi-conservative ✅
B) Conservative
C) Dispersive
D) Random
5. Which is not membrane-bound?
A) Ribosome ✅
B) Mitochondria
C) Nucleus
D) ER
6. Photosynthesis equation produces:
A) Glucose + O_2 ✅
B) CO_2
C) H_2O
D) ATP only
7. Cell membrane is:
A) Selectively permeable ✅
B) Fully permeable
C) Impermeable
D) Rigid
8. Genetic material:
A) DNA ✅
B) Protein
C) Lipid
D) Carbohydrate
9. Lysosome function:
A) Digestion ✅
B) Respiration
C) Photosynthesis
D) Storage
10. Plant hormone:
A) Auxin ✅
B) Insulin
C) Adrenaline
D) Thyroxine

12 Basic unit of life:
A) Tissue
B) Cell
C) Organ
D) Atom
Ans: B

13 Photosynthesis occurs in:
A) Mitochondria
B) Nucleus
C) Chloroplast
D) Ribosome
Ans: C

14 DNA stands for:
A) Deoxyribonucleic Acid
B) Ribonucleic Acid
C) Dynamic Acid
D) Double Acid
Ans: A

15 Human heart has:
A) 2 chambers
B) 3 chambers
C) 4 chambers
D) 5 chambers
Ans: C

16 Blood group universal donor:
A) A
B) B
C) AB
D) O
Ans: D

17 Respiratory organ in fish:
A) Lungs
B) Gills
C) Skin
D) Trachea
Ans: B

18 Vitamin C deficiency causes:
A) Rickets
B) Scurvy
C) Night blindness
D) Beriberi
Ans: B

19 Largest organ of human body:
A) Liver
B) Skin
C) Heart
D) Brain
Ans: B

20 Plant hormone:
A) Insulin
B) Auxin
C) Thyroxine
D) Adrenaline
Ans: B

11. Process of cell division:
A) Photosynthesis
B) Respiration
C) Mitosis
D) Digestion
Ans: C

📐 MATHEMATICS (10 MCQs)

1. If f(x)=x2f(x)=x^2f(x)=x2, derivative is:
A) 2x ✅
B) x
C) x^2
D) 1

2. Determinant of
|1 2|
|3 4| =
A) -2 ✅
B) 2
C) 10
D) 0

3. Solution of x2−4=0x^2 - 4 = 0x2−4=0:
A) ±2 ✅
B) 2
C) -2
D) 4

4. $\sin^2\theta + \cos^2\theta$ =
A) 1 ✅
B) 0
C) 2
D) θ

5. Probability of sure event:
A) 1 ✅
B) 0
C) ½
D) ∞

6. If A ⊂ B, then:
A) All elements of A in B ✅
B) All B in A
C) A=B
D) None

7. If slope = 0, line is:
A) Horizontal ✅

B) Vertical
C) Inclined
D) Parallel

8. Value of i2i^2i2:
A) -1 ✓
B) 1
C) 0
D) 2

9. Sum of AP formula:
A) n/2[2a+(n-1)d] ✓
B) nd
C) a+d
D) n^2

10. Value of π is approximately:
A) 2.14
B) 3.14
C) 4.13
D) 1.34
Ans: B

11. m√16 =
A) 2
B) 3
C) 4
D) 5
Ans: C

12. sin 90° =
A) 0
B) 1
C) -1
D) ½
Ans: B

13. $Log_{10}10$ =
A) 0
B) 1
C) 10
D) -1
Ans: B

14. 2^2 =
A) 2
B) 4
C) 6
D) 8
Ans: B

15. Derivative of x^2 =
A) x
B) 2x
C) x^2
D) 2
Ans: B

16. ∫dx =
A) x
B) x + C
C) 1
D) 0
Ans: B

17. Equation of straight line:
A) y = mx + c
B) $y = mx^2$
C) x = my
D) $y^2 = mx$
Ans: A

18. 5! =
A) 25
B) 60
C) 120
D) 100
Ans: C

19. • Probability lies between:
A) 0 to 1
B) 1 to 10
C) -1 to 1
D) 0 to 10
Ans: A

PHYSICS (15 MCQs)

1. A particle moves with velocity v=3t2−6tv = 3t^2 - 6tv=3t2−6t. Displacement from t=0t=0t=0 to t=2t=2t=2:
A) 0
B) 2
C) 4
D) 0 ✓

4. Work done by variable force F=kx2F = kx^2F=kx2 from 0→a:
A) ka2ka^2ka2
B) ka3/2ka^3/2ka3/2

C) ka3/3ka^3/3ka3/3 ✓
D) ka3ka^3ka3

5. A projectile has same range for θ and (90−θ). Reason:
A) sin(2θ)=sin(180−2θ) ✓
B) cos symmetry
C) tan symmetry
D) velocity constant

6. Escape velocity ratio (Earth : Moon):
A) 1:1
B) √(Me/Re)
C) Depends on gR
D) √(gR) ratio ✓

7. A particle in circular motion has constant speed. Which is true?
A) Acceleration zero
B) Velocity constant
C) Acceleration changes direction ✓
D) Force zero

8. Two bodies collide elastically. Total conserved:
A) Momentum only
B) KE only
C) Both momentum & KE ✓
D) Energy only

9. If radius of orbit doubles, period becomes:
A) 2T
B) 4T
C) 22T2\sqrt{2}T22T ✓
D) 8T

10. Angular momentum depends on:
A) r×p ✓
B) r+p
C) p/r
D) r^2

11. If net force zero, body:
A) Must be at rest
B) Moves with constant velocity ✓
C) Accelerates
D) Stops

12. A lift accelerating upward: apparent weight:
A) mg
B) m(g+a) ✓
C) m(g−a)
D) zero

13. Power =
A) dW/dt ✓
B) W/t^2
C) F×t
D) m×a

14. KE proportional to:
A) v
B) v^2 ✓
C) v^3
D) √v

15. If force ∝ velocity, motion becomes:
A) Uniform
B) Exponential decay ✓
C) Linear
D) Circular

CHEMISTRY (15 MCQs)

16. Number of electrons in 1 mole of Na^+:
A) 6.022×10^{23}6.022×10^{23}6.022×1023
B) 10×6.022×102310×6.022×10^{23}10×6.022×1023
C) 11×6.022×102311×6.022×10^{23}11×6.022×1023
D)

10×6.022×102310×6.022×10^{23}10×6.022×1023 ✓

17. Hybridization in C_2H_2:
A) sp^3
B) sp^2
C) sp ✓
D) dsp^2

18. Which has maximum bond angle?
A) NH_3
B) H_2O
C) CH_4
D) BF_3 ✓

19. Oxidation state of Cr in $K_2Cr_2O_7$:
A) +3
B) +6 ✓
C) +2
D) +4

20. Mole fraction of solvent in dilute solution:
A) ≈1 ✓
B) 0
C) >1
D) <0

21. Which law: $V \propto T$?
A) Boyle
B) Charles ✓
C) Dalton
D) Avogadro

22. Ionization energy highest in:
A) Na
B) Mg
C) Cl
D) Ne ✓

23. Strongest intermolecular force:
A) Van der Waals
B) Dipole
C) Hydrogen bond ✓
D) Ionic

24. Which is amphoteric?
A) Al_2O_3 ✓
B) Na_2O
C) CO_2
D) HCl

25. Bond order of O_2:
A) 1
B) 2 ✓
C) 3
D) 0

26. Ideal gas deviation high at:
A) Low P, High T
B) High P, Low T ✓
C) Low P, Low T
D) High T

27. Which has zero dipole moment?
A) NH_3
B) H_2O
C) CO_2 ✓
D) SO_2

28. Which is strongest acid?
A) HCl
B) HBr
C) HI ✓
D) HF

29. Atomic size increases:
A) Across period
B) Down group ✓
C) Same
D) Random

30. Which obeys octet exception?
A) BF_3 ✓
B) CH_4
C) NH_3
D) H_2O

🌿 BIOLOGY (10 MCQs)

31. Which organelle has its own DNA?
A) Nucleus
B) Mitochondria ✅
C) Ribosome
D) ER

32. Enzyme specificity due to:
A) Shape of active site ✅
B) Temperature
C) Pressure
D) Light

33. Fluidity of membrane depends on:
A) Lipid composition ✅
B) Protein only
C) DNA
D) RNA

34. Which is NOT carbohydrate?
A) Starch
B) Glycogen
C) Cellulose
D) Insulin ✅

35. Genetic code is:
A) Universal ✅
B) Random
C) Variable
D) Partial

36. ATP contains:
A) 3 phosphate groups ✅
B) 2
C) 1
D) 4

37. Which is reducing sugar?
A) Glucose ✅
B) Sucrose
C) Starch
D) Cellulose

38. Which cycle in respiration?
A) Krebs cycle ✅
B) Calvin
C) Urea
D) Nitrogen

39. Which is heterotrophic?
A) Plants
B) Algae
C) Animals ✅
D) Cyanobacteria

40. DNA located in:
A) Nucleus + mitochondria ✅
B) Only nucleus
C) Only cytoplasm
D) Ribosome

📐 MATHEMATICS (10 MCQs)

41. If x+1x=3x + \frac{1}{x} = 3x+x1 =3, find x2+1x2x^2 + \frac{1}{x^2}x2+x21:
A) 5
B) 7 ✅
C) 9
D) 11

42. Determinant zero implies:
A) Unique solution
B) Infinite or no solution ✅
C) No solution only
D) Always infinite

43. If sinθ = 3/5, cosθ = ?
A) 4/5 ✅
B) 5/4
C) 3/4
D) 1

44. If A={1,2}, B={2,3}, A∩B:
A) {1}
B) {2} ✅
C) {3}
D) ∅

45. If $\log_{10} x = 2$, x =
A) 10
B) 100 ✓
C) 2
D) 20

46. Value of ∑n=13n\sum_{n=1}^{3} n∑n=13n:
A) 3
B) 6 ✓
C) 9
D) 12

47. If roots equal, discriminant:
A) >0
B) <0
C) =0 ✓
D) ∞

48. If slope undefined:
A) Horizontal
B) Vertical ✓
C) Inclined
D) Parallel

49. Complex number form:
A) a+bi ✓
B) a/b
C) ab
D) a^2

50. If $\tan\theta = 1$, θ =
A) 30°
B) 45° ✓
C) 60°
D) 90°