

## Mock Test 09 - Mehran University Entry Test Preparation

**Date:** April 11, 2025

**Instructions:** Choose the correct option (a, b, c, or d) for each question. Each question carries equal marks.

### Physics (25 Questions)

1. The SI unit of electric current is:
  - a) Coulomb
  - b) Ampere
  - c) Volt
  - d) Ohm
2. The degree of hotness or coldness of a body is measured as:
  - a) Heat capacity
  - b) Temperature
  - c) Heat energy
  - d) Specific heat
3. Unlike charges:
  - a) Repel each other
  - b) Attract each other
  - c) Cancel each other
  - d) Do not interact
4. Electromagnetic waves travel in free space at the speed of:
  - a) Sound
  - b) Light
  - c) Gravity
  - d) Electricity
5. One gauss (G) is equivalent to how many tesla (T)?
  - a)  $10^{-1}$  T
  - b)  $10^{-2}$  T
  - c)  $10^{-3}$  T
  - d)  $10^{-4}$  T

6. One horsepower is equal to:
- a) 647 watts
  - b) 746 watts
  - c) 446 watts
  - d) 846 watts
7. To convert a galvanometer into a voltmeter, you should connect:
- a) A high resistance in series
  - b) A low resistance in parallel
  - c) A capacitor in series
  - d) A diode in parallel
8. If a body moves with constant velocity, its acceleration is:
- a) Zero
  - b) Variable
  - c) Increasing
  - d) Negative
9. The kinetic energy of a mass attached to a spring is given by:
- a)  $\frac{1}{2}k(x_0^2 - x^2)$
  - b)  $\frac{1}{2}k\sqrt{x_0^2 - x^2}$
  - c)  $\frac{1}{2}k^2(x_0^2 - x^2)$
  - d)  $\frac{1}{2}k(x^2 - x_0^2)$
10. Waves that require a medium for propagation are called:
- a) Electromagnetic waves
  - b) Mechanical waves
  - c) Transverse waves
  - d) Matter waves
11. The refractive index of a medium is:
- a) Inversely proportional to the wavelength of light
  - b) Directly proportional to the wavelength of light
  - c) Independent of wavelength
  - d) Proportional to the square of wavelength
12. Interference and diffraction demonstrate the:
- a) Particle nature of light

- b) Wave nature of light
  - c) Dual nature of light
  - d) Quantum nature of light
13. The condition for complete equilibrium requires:
- a) Sum of all forces to be zero
  - b) Sum of all torques to be zero
  - c) Sum of all forces and torques to be zero
  - d) Zero angular velocity
14. The SI unit of heat energy is:
- a) Calorie
  - b) Joule
  - c) B.T.U.
  - d) Kilo-Calorie
15. The dimensions of frequency are:
- a)  $T^{-1}$
  - b)  $LT^{-1}$
  - c)  $MT^{-1}$
  - d)  $L^2T^{-1}$
16. If the mass of a body is doubled and its radius is also doubled, the gravitational force:
- a) Remains the same
  - b) Becomes half
  - c) Doubles
  - d) Quadruples
17. The turning effect of a force is known as:
- a) Momentum
  - b) Torque
  - c) Impulse
  - d) Pressure
18. The unit of torque in the SI system is:
- a)  $N \cdot m$
  - b)  $kg \cdot m/s^2$

- c) J/s
- d)  $\text{N}\cdot\text{m}^2$

19. The rate of doing work is called:

- a) Energy
- b) Power
- c) Force
- d) Momentum

20. Electron volt (eV) is a unit of:

- a) Charge
- b) Energy
- c) Potential
- d) Current

21. The equation of Hooke's law is:

- a)  $F = kx$
- b)  $F = -kx$
- c)  $F = k/x$
- d)  $F = -k/x$

22. The dimension of work is:

- a)  $\text{ML}^2\text{T}^{-2}$
- b)  $\text{MLT}^{-2}$
- c)  $\text{ML}^2\text{T}^{-1}$
- d)  $\text{M}^2\text{LT}^{-2}$

23. Simple harmonic motion is an example of:

- a) Linear motion
- b) Periodic motion
- c) Rotational motion
- d) Random motion

24. If two circles of radii 3 cm and 4 cm touch externally, the distance between their centers is:

- a) 1 cm
- b) 4 cm
- c) 7 cm

d) 5 cm

25. Modern physics emerged primarily due to:

- a) Newton's laws
- b) Einstein's relativity and quantum mechanics
- c) Maxwell's equations
- d) Huygens' wave theory

### Mathematics (25 Questions)

26. In the SI system, the number of base units is:

- a) Three
- b) Five
- c) Seven
- d) Nine

27. One mega is equal to:

- a)  $10^6$
- b)  $10^{-6}$
- c)  $10^9$
- d)  $10^{-9}$

28. One pico is equal to:

- a)  $10^{-9}$
- b)  $10^{-12}$
- c)  $10^{-6}$
- d)  $10^{-3}$

29. If  $f(x) = x/(x^2 - 4)$ , then  $f(2)$  is:

- a) 2
- b) -1
- c) Undefined
- d) 8

30. The derivative of  $\cot^{-1}(x)$  is:

- a)  $1/(1 + x^2)$
- b)  $-1/(1 + x^2)$
- c)  $1/\sqrt{1 - x^2}$

d)  $-1/\sqrt{1-x^2}$

31. The formula for  $\sin(\alpha + \beta)$  is:

a)  $\sin \alpha \cos \beta + \cos \alpha \sin \beta$

b)  $\sin \alpha \cos \beta - \cos \alpha \sin \beta$

c)  $\cos \alpha \cos \beta + \sin \alpha \sin \beta$

d)  $\cos \alpha \cos \beta - \sin \alpha \sin \beta$

32. The slope of a line is given by:

a)  $\Delta x / \Delta y$

b)  $\Delta y / \Delta x$

c)  $x/y$

d)  $y/x$

33. The equation of Newton's second law of motion is:

a)  $F = ma$

b)  $F = mv$

c)  $F = m/a$

d)  $F = m^2a$

34. The dimension of velocity is:

a)  $LT^{-1}$

b)  $LT^{-2}$

c)  $L^2T^{-1}$

d)  $MLT^{-1}$

35. If a vector has magnitude 5 and direction  $60^\circ$  from the x-axis, its x-component is:

a) 5

b) 2.5

c) 4.33

d) 3

36. The integral of  $2x \, dx$  is:

a)  $x^2 + C$

b)  $2x^2 + C$

c)  $x + C$

d)  $2x + C$

37. The sum of the first  $n$  terms of an arithmetic sequence is given by:

- a)  $n/2[2a + (n - 1)d]$
- b)  $n[a + l]$
- c)  $n/2[a + l]$
- d)  $n[2a - (n - 1)d]$

38. The value of  $\cos(90^\circ)$  is:

- a) 1
- b) 0
- c) -1
- d) Undefined

39. The quadratic formula for  $ax^2 + bx + c = 0$  is:

- a)  $[-b \pm \sqrt{b^2 - 4ac}]/2a$
- b)  $[-b \pm \sqrt{b^2 + 4ac}]/2a$
- c)  $[b \pm \sqrt{b^2 - 4ac}]/2a$
- d)  $[-b \pm \sqrt{4ac - b^2}]/2a$

40. If  $\log_5(25) = x$ , then  $x$  is:

- a) 1
- b) 2
- c) 3
- d) 4

41. The area of a circle with radius  $r$  is:

- a)  $\pi r^2$
- b)  $2\pi r$
- c)  $\pi r$
- d)  $4\pi r^2$

42. The value of  $(3!)$  is:

- a) 3
- b) 6
- c) 9
- d) 12

43. The equation of a straight line with slope  $m$  and y-intercept  $c$  is:

- a)  $y = mx + c$

b)  $y = cx + m$

c)  $x = my + c$

d)  $x = cy + m$

44. If  $\tan \theta = 1$ , then  $\theta$  is:

a)  $0^\circ$

b)  $30^\circ$

c)  $45^\circ$

d)  $90^\circ$

45. The sum of angles in a triangle is:

a)  $90^\circ$

b)  $180^\circ$

c)  $270^\circ$

d)  $360^\circ$

46. The limit of  $(x^2 - 4)/(x - 2)$  as  $x$  approaches 2 is:

a) 0

b) 2

c) 4

d) Undefined

47. The roots of  $x^2 - 5x + 6 = 0$  are:

a) 2 and 3

b) 1 and 6

c) -2 and -3

d) 5 and 1

48. The Pythagorean identity is:

a)  $\sin^2 \theta + \cos^2 \theta = 1$

b)  $\sin \theta + \cos \theta = 1$

c)  $\tan^2 \theta + 1 = \sec^2 \theta$

d) Both a and c

49. The distance between points (1, 2) and (4, 6) is:

a) 5

b) 6

c) 7



d) 8

50. The value of  $e^0$  is:

a) 0

b) 1

c)  $e$

d) Undefined

### Chemistry (25 Questions)

51. The general formula for alkanes is:

a)  $C_nH_{2n+2}$

b)  $C_nH_{2n}$

c)  $C_nH_{2n-2}$

d)  $C_nH_n$

52. The hybridization of carbon in methane ( $CH_4$ ) is:

a) sp

b)  $sp^2$

c)  $sp^3$

d)  $sp^3d$

53. The unit of density in the SI system is:

a)  $kg/m^3$

b)  $g/cm^3$

c)  $kg/cm^3$

d)  $g/m^3$

54. The rate of a chemical reaction is affected by:

a) Temperature

b) Concentration

c) Catalyst

d) All of the above

55. The atomic number of an element represents:

a) Number of neutrons

b) Number of protons

c) Number of electrons

- d) Mass number
- 56. One mole of a substance contains:
  - a)  $6.022 \times 10^{23}$  particles
  - b)  $6.022 \times 10^{22}$  particles
  - c)  $6.022 \times 10^{24}$  particles
  - d)  $6.022 \times 10^{21}$  particles
- 57. The pH of a neutral solution is:
  - a) 0
  - b) 7
  - c) 14
  - d) 1
- 58. The strongest type of intermolecular force in water is:
  - a) London dispersion
  - b) Dipole-dipole
  - c) Hydrogen bonding
  - d) Ionic bonding
- 59. The oxidation state of oxygen in  $\text{H}_2\text{O}_2$  is:
  - a) -2
  - b) -1
  - c) 0
  - d) +1
- 60. The gas constant  $R$  in SI units is:
  - a)  $8.314 \text{ J/mol}\cdot\text{K}$
  - b)  $0.0821 \text{ L}\cdot\text{atm/mol}\cdot\text{K}$
  - c)  $8.314 \text{ L}\cdot\text{atm/mol}\cdot\text{K}$
  - d)  $0.0821 \text{ J/mol}\cdot\text{K}$
- 61. The formula of sulfuric acid is:
  - a)  $\text{HNO}_3$
  - b)  $\text{HCl}$
  - c)  $\text{H}_2\text{SO}_4$
  - d)  $\text{H}_3\text{PO}_4$
- 62. A hydrocarbon with a triple bond is classified as:

- a) Alkane
  - b) Alkene
  - c) Alkyne
  - d) Aromatic
63. The primary source of energy in Earth's climate system is:
- a) Geothermal energy
  - b) Solar radiation
  - c) Nuclear energy
  - d) Tidal energy
64. The unit of molar mass is:
- a) g/mol
  - b) kg/mol
  - c) g/cm<sup>3</sup>
  - d) kg/m<sup>3</sup>
65. The process of conversion of a solid directly into a gas is called:
- a) Melting
  - b) Sublimation
  - c) Evaporation
  - d) Condensation
66. The number of electrons in the outermost shell of noble gases is:
- a) 2
  - b) 4
  - c) 6
  - d) 8
67. The chemical formula of sodium chloride is:
- a) NaCl
  - b) Na<sub>2</sub>Cl
  - c) NaCl<sub>2</sub>
  - d) Na<sub>2</sub>Cl<sub>2</sub>
68. The reaction  $2H_2 + O_2 \rightarrow 2H_2O$  is an example of:
- a) Decomposition
  - b) Combination

- c) Displacement
  - d) Redox
69. The boiling point of water at standard pressure is:
- a)  $0^{\circ}\text{C}$
  - b)  $100^{\circ}\text{C}$
  - c)  $50^{\circ}\text{C}$
  - d)  $25^{\circ}\text{C}$
70. Avogadro's number is used to relate:
- a) Mass and volume
  - b) Moles and particles
  - c) Pressure and temperature
  - d) Energy and work
71. The element with atomic number 8 is:
- a) Nitrogen
  - b) Oxygen
  - c) Fluorine
  - d) Carbon
72. The bond in HCl is:
- a) Ionic
  - b) Covalent
  - c) Metallic
  - d) Hydrogen
73. The catalyst in the Haber process for ammonia synthesis is:
- a) Iron
  - b) Platinum
  - c) Nickel
  - d) Copper
74. The formula of glucose is:
- a)  $\text{C}_6\text{H}_{12}\text{O}_6$
  - b)  $\text{C}_6\text{H}_{10}\text{O}_5$
  - c)  $\text{C}_{12}\text{H}_{22}\text{O}_{11}$
  - d)  $\text{CH}_2\text{O}$

75. The Law of Conservation of Mass was proposed by:

- a) Dalton
- b) Lavoisier
- c) Boyle
- d) Charles

### English (25 Questions)

76. Choose the correct sentence:

- a) His father came here during the summer vacation.
- b) His father came here during the summer vacations.
- c) His father came here during the summer vocation.
- d) His father came here during the summer vocations.

77. Identify the grammatically correct sentence:

- a) Her hair have turned grey.
- b) Her hairs have turned grey.
- c) Her hair has turned grey.
- d) Her heirs has turned grey.

78. Choose the correct option:

- a) His elder son bought ten dozens eggs.
- b) His elder son bought ten dozen eggs.
- c) His elder son bought ten dozens of eggs.
- d) His elder son bought ten dozen of eggs.

79. Select the correct sentence:

- a) The scenery of Murree are charming.
- b) The sceneries of Murree is charming.
- c) The scenery of Murree is charming.
- d) The scenery of Murree are charmings.

80. Fill in the blank: She is well \_\_\_ in mathematics.

- a) up
- b) down
- c) at
- d) off

81. She persisted --- doing the job despite its difficulty.
- a) on
  - b) in
  - c) at
  - d) with
82. The newspaper founded by Quaid-e-Azam Muhammad Ali Jinnah was:
- a) The News
  - b) Dawn
  - c) Pakistan Times
  - d) Guardian
83. After World War II, Britain decided to:
- a) Quit India
  - b) Enter Pakistan
  - c) Quit Kashmir
  - d) Enter Kashmir
84. The word “familiar” means:
- a) Unknown
  - b) Known
  - c) Strange
  - d) Foreign
85. The word “feasible” means:
- a) Impossible
  - b) Doable
  - c) Impractical
  - d) Unlikely
86. The meaning of “corpse” is:
- a) Illness
  - b) Dead body
  - c) Courtyard
  - d) Treatment
87. “Precaution” means:
- a) Carelessness

- b) Far-sightedness
- c) Limits
- d) Bounds

88. "Entreaties" refers to:

- a) Requests
- b) Commands
- c) Exclamations
- d) Warnings

89. He said, "Would that I were rich."

- a) He wished that he was rich.
- b) He prayed that he were rich.
- c) He said that he was rich.
- d) He wished that he had been rich.

90. The doctor said to her, "Do not take this medicine before eating."

- a) The doctor forbade her to take the medicine before eating.
- b) The doctor advised her to take the medicine before eating.
- c) The doctor allowed her to take the medicine before eating.
- d) The doctor suggested her not to take the medicine before eating.

91. He said to his servant, "Why are you so lazy today?"

- a) He asked his servant why he was so lazy that day.
- b) He told his servant why he was so lazy today.
- c) He asked his servant why was he so lazy that day.
- d) He ordered his servant to not be lazy today.

92. I said to Ali, "Goodbye my friend, I hope to see you soon."

- a) I bade my friend Ali goodbye and hoped to see him soon.
- b) I told Ali goodbye and wished to see him soon.
- c) I said goodbye to Ali and ordered him to see me soon.
- d) I wished Ali goodbye and told him to see me soon.

93. Choose the correct spelling:

- a) Recieve
- b) Receive
- c) Receeve

- d) Recive
- 94. Identify the error: "Nobody speaks more clearly than him."
  - a) Nobody
  - b) speaks
  - c) more clearly
  - d) than him
- 95. The family name of Mrs. Meldon in literature is:
  - a) Katherine
  - b) Charlotte
  - c) Sarah
  - d) Caroline
- 96. Liaquat Ali Khan was assassinated on:
  - a) 15th October
  - b) 16th October
  - c) 14th October
  - d) 17th October
- 97. Choose the correct form:
  - a) He don't know the answer.
  - b) He doesn't know the answer.
  - c) He didn't knows the answer.
  - d) He don't knows the answer.
- 98. The synonym of "persist" is:
  - a) Give up
  - b) Continue
  - c) Stop
  - d) Delay
- 99. The antonym of "frequent" is:
  - a) Rare
  - b) Common
  - c) Regular
  - d) Often
- 100. Fill in the blank: He is \_\_\_ honest man.



- a) a
- b) an
- c) the
- d) none