PREVIOUS YEAR PAPER

UPPSC GIC Lecturer 2025 Prelims — Physics (TUKU-05)

UPPSC GIC Lecturer

66 of the paper's 120 questions · +2.5 for a correct answer, −0.83 for a wrong one · 120 minutes

Left out of the original paper: 54 (any question that needs a figure, a symbol or formatting we cannot show, or whose text did not read back cleanly from the booklet).

The official booklet is a scan with no text; ExamBharo typed this paper from it by hand. Report a typing slip through exambharo.com/contact/.

Questions from the Uttar Pradesh Public Service Commission's paper. Each question is followed by its answer, and the answer key is repeated on the last page.

Take it as a timed practice test: exambharo.com/uppsc-gic-lecturer/previous-year-papers/uppsc-gic-lecturer-2025-prelims-physics/

Physics

41. Which of the following is NOT an assumption in deriving Poiseuille's equation for flow of liquid through a capillary tube?

(a) There is no radial flow of liquid

(b) The liquid in contact with the walls of the tube is stationary

(c) Fluid has zero viscosity

(d) Flow is steady, streamline and parallel to the axis of the tube

Answer: (c)

42. The phase velocity of a wave is defined as the v[illegible]city at which

(a) The wavefront of the wave propaga[illegible]

(b) The wave amplitude propagates

(c) The wave's frequency changes

(d) The energy of the wave propagates

Answer: (a)

43. The volume of a gas at 1 atm. pressure (= 1.0 × 105 Nm^{-2}) is 2.2 liter when 250 Joule heat is given at constant pressure, its volume becomes 2.6 lit. The change in the internal energy of the gas is

(a) 246 Joule

(b) 210 Joule

(c) 256 Joule

(d) None of these

Answer: (b)

44. If the number of rulings on a diffraction grating surface be N, then the intensity of principal maxima obtained by this grating will be

(a) N^2 - times

(b) N^3 - times

(c) N4 - times

(d) N - times

Answer: (a)

45. What does Kirchhoff's first law (junction rule) state?

(a) The total current in a closed circuit is zero

(b) The total voltage in a circuit is zero

(c) The total voltage at a junction is zero

(d) The total current at a junction is zero

Answer: (d)

46. The direction of the vector product of two vectors is given by

(a) Fleming left hand rule

(b) Right handed screw rule

(c) Both (a) and (b)

(d) None of these

Answer: (b)

47. The ratio of orbital velocities of an electron in firs ıd second orbit of hydrogen atom is

(a) 2 : 1

(b) 4 : 1

(c) 1 : 4

(d) 1 : 2

Answer: (a)

48. The amplitude of damped harmonic oscillator with time

(a) Decreases harmonically

(b) Remains constant

(c) Decreases exponentially

(d) None of the above

Answer: (c)

49. Which material has domains of atomic magnetic dipoles even in the absence of an external magnetic field?

(a) Ferromagnetic material

(b) Diamagnetic material

(c) Paramagnetic material

(d) None of the above

Answer: (a)

50. The quantity (U + PV) is known as (Where all the symbols have their usual meanings)
(a) Enthalpy
(b) Specific heat
(c) Total energy
(d) Entropy
Answer: (a)

51. What distinguishes an intrinsic semiconductor from an extrinsic semiconductor?
(a) The method of doping
(b) The type of energy band gap
(c) The energy band structure
(d) The presence of impurities in the material
Answer: (d)

52. A wave has length 20 λ (where λ = 600 nm). The coherence time of this wave will be
(a) 4.4 micro second
(b) 4.0×10^{-14} sec
(c) 4.4×10^{-10} sec
(d) 4.4 sec
Answer: (b)

53. When a nucleus in an atom undergoes a radioacti decay, the electronic energy levels of the atom
(a) Change for α and β radioactivity, but not for adioactivity
(b) Change for α-radioactivity, but not
(c) Change for β-radioactivity, but not for oth
(d) Do not change for any type of radioactivity
Answer: (a)

54. Calculate the wavelength separation between the unmodified line of wavelength 6000 Å and the modified lines when a magnetic induction of 1 Wb/m² is applied in normal Zeeman effect.
(a) 0.168 Å
(b) 16.8 Å
(c) 1.68 A
(d) None of the above
Answer: (a)

55. The work done by all the forces (external and internal) on a system equals the change in
(a) Potential energy
(b) Total energy
(c) Kinetic energy
(d) None of these
Answer: (c)

56. The total energy of an electron in an atom is
    (a) twice its potential energy
    (b) equal to its potential energy
    (c) thrice its potential energy
    (d) half of its potential energy
    Answer: (d)

57. As the frequency of an alternating current increases, the impedance of the LR circuit
    (a) Remains constant
    (b) Increases continuously
    (c) Decreases continuously
    (d) None of the above
    Answer: (b)

58. A Carnot engine works between 0°C and 100°C. Its efficiency will be
    (a) 36.6%
    (b) 37.3%
    (c) 70%
    (d) 26.8%
    Answer: (d)

59. Which logic gate produces an output that is the in se of its input?
    (a) AND gate
    (b) NOT gate
    (c) NAND gate
    (d) OR gate
    Answer: (b)

60. In an LCR circuit, what is the total impedance at the resonance condition?
    (a) Inductive only
    (b) Capacitive only
    (c) Resistive only
    (d) Zero
    Answer: (c)

61. Fourier series of a square wave function contains
    (a) All harmonics
    (b) Only even harmonics
    (c) Only odd harmonics
    (d) None of the above
    Answer: (c)

62. A wave function which satisfies time independent Schrödinger equation, then probability of finding the particle in any region is always

(a) zero

(b) dependent of time

(c) independent of time

(d) none of the above

Answer: (c)

63. Given below are two statements, one is labelled as Assertion (A) and other as Reason (R).
Assertion (A): A spinning top processes because the gravitational torque changes the direction of its angular momentum.
Reason (R): The gravitational torque and angular momentum vectors are parallel for a spinning top.
Choose the correct answer using the code given below:

(a) Both (A) and (R) true, but (R) is not correct explanation of (A)

(b) (A) is true, but (R) is false

(c) (A) is false, but (R) is true

(d) Both (A) and (R) true and (R) is the correct explanation of (A)

Answer: (b)

65. Given below are two statements, one is labelled as Assertion (A) and the other as Reason (R).
Assertion (A): A Michelson interferometer works on the principle of interference by division of amplitude.
Reason (R): A beam of light is splitted into two perpendicular paths using a half silvered mirror and then reflecting each beam back from a mirror.
Select the correct answer using the code given bel

(a) Both (A) and (R) are true and (R) is correct explanation of (A)

(b) (A) is true, but (R) is false

(c) (A) is false, but (R) is true

(d) Both (A) and (R) are true, but (R) is not correct explanation of (A)

Answer: (a)

68. What is the central bright region in a diffraction pattern called?

(a) Central diffraction

(b) Central maxima

(c) Central minima

(d) Central refraction

Answer: (b)

69. In Bohr's model of hydrogen atom, what is the relationship between the radius of an electron's orbit and its energy level?

(a) Radius is independent of energy level

(b) Radius increases with increasing energy levels

(c) Radius remains constant for all energy levels

(d) Radius decreases with increasing energy levels

Answer: (b)

70. Which of the following conditions typically leads to a positive Joule-Thomson coefficient?
    (a) Low temperature and high pressure
    (b) High temperature and high pressure
    (c) Low temperature and low pressure
    (d) High temperature and low pressure
    Answer: (a)

71. In Helium-Neon Laser, the ratio of Helium and Neon is
    (a) 7 : 1
    (b) 1 : 1
    (c) 2 : 1
    (d) None of the above
    Answer: (a)

72. Addition of trivalent impurity to a semiconductor creates
    (a) Both holes and free electrons
    (b) Many holes
    (c) Many free electrons
    (d) None of the above
    Answer: (b)

73. When the torque acting on a system is zero, which the following will be constant?
    (a) Linear momentum
    (b) Angular momentum
    (c) Linear impulse
    (d) Force
    Answer: (b)

74. Interaction between the neighbouring dipoles is negligible in the case of which materials?
    (a) Paramagnetic material
    (b) Antiferromagnetic material
    (c) Ferromagnetic material
    (d) Diamagnetic material
    Answer: (a)

75. For longer wavelengths, Planck's radiation law reduces to
    (a) Wein's displacement law
    (b) Stefan's law
    (c) Rayleigh-Jean's law
    (d) None of the above
    Answer: (c)

76. Given below are two statements, one is labelled as Assertion (A) and other as Reason (R).
Assertion (A): For heavy nuclides, the stability curve bends in the direction of N > Z, where N is number of neutrons and Z is the number of protons in a nucleus.
Reason (R): For larger value of Z, the Coulomb's electrostatic repulsion becomes important and the nucleus becomes unstable.
Select the correct answer using the code given below.

(a) Both (A) and (R) are true and (R) is not the correct explanation of (A)

(b) (A) is true, but (R) is false

(c) (A) is false, but (R) is true

(d) Both (A) and (R) are true and (R) is the correct explanation of (A)

Answer: (a)

78. Which of the following is the correct definition of Young's modulus?

(a) The ratio of tensile stress to tensile strain

(b) The ratio of compressive stress to compressive strain

(c) The ratio of volumetric stress to volumetric strain

(d) The ratio of shear stress to shear strain

Answer: (a)

79. A condenser of 2 μF capacity is discharged through a resistance of 10 Ohms and 2 Henry inductance. The quality factor of the circuit will be

(a) 1000

(b) 100

(c) 1.0

(d) 10

Answer: (b)

80. The distance between the nearest node and antinode in a stationary wave is (Where λ is wavelength)

(a) λ/2

(b) 3λ/4

(c) λ

(d) λ/4

Answer: (d)

82. The flow profile of advancing liquid in a tube is a

(a) Circle

(b) Parabola

(c) Hyperbola

(d) Straight line

Answer: (b)

83. A double convex lens has two surfaces of same radius R. The refractive index of lens is 1.5. The focal length (f) of this lens will be

(a) f = R

(b) f = -R

(c) f = 2R

(d) f = R/2

Answer: (a)

84. The function of moderator in a nuclear reactor is to

(a) react with uranium to release energy

(b) slow down fast neutrons so as to have greater probability for nuclear fission to occur

(c) absorb gamma-radiations

(d) provide neutrons for fission reaction

Answer: (b)

85. Which of the following processes does NOT occur in a Carnot cycle?

(a) Adiabatic expansion

(b) Isothermal compression

(c) Isochoric heating

(d) Isothermal expansion

Answer: (c)

86. Ripple factor of a half wave rectifier is

(a) 0.48

(b) 0.81

(c) 1.21

(d) 0.23

Answer: (c)

87. In an amplitude modulation, the percentage of modulation is 100%, then the carrier and modulating waves will have

(a) equal frequencies

(b) equal amplitudes

(c) both (a) and (b)

(d) different amplitudes and different frequencies

Answer: (b)

88. According to Stokes' law, the viscous drag force on a small sphere moving through a viscous fluid is directly proportional to

(a) The velocity of the sphere only

(b) Both the radius and velocity of the sphere

(c) The radius of the sphere only

(d) The square of the radius of the sphere

Answer: (b)

91. Two bullets are fired simultaneously horizontally with different speeds from the same place. Which bullet will hit the ground first?

(a) The slower one
(b) Both simultaneously
(c) Depends on masses
(d) The faster one

Answer: (b)

92. The diameter of telescope required to resolve two stars separated by 10^{-3} degree will be (assume λ = 5000 Å)

(a) 0.000349 meter
(b) 0.0349 meter
(c) 3.03 meter
(d) None of the above

Answer: (b)

95. The energy band gap is maximum in

(a) Super conductors
(b) Insulators
(c) Semiconductors
(d) Metals

Answer: (b)

97. If the medium on both sides of the lens is the sa , then the nodal points coincide with

(a) Focal and principal points both
(b) Focal points
(c) Principal points
(d) None of the above

Answer: (c)

98. Continuous spectrum of X-rays is the result of

(a) Inverse photoelectric effect
(b) Meissner effect
(c) Photoelectric effect
(d) Compton effect

Answer: (a)

99. Which of the following is invariant under Lorentz transformation?

(a) Length interval
(b) Space-time interval
(c) Velocity
(d) Time interval

Answer: (b)

100. Read the following statements and choose the correct option from the code given below.
i. There are six cardinal points in a co-axial optical system of two thin lenses.
ii. The location of principal planes is characteristic of the given optical system.
iii. The distance between two principal points is twice the distance between two nodal points.
iv. The nodal points coincide with the principal points if the refractive index on either side of the lens is same.

(a) ii, iii and iv are true
(b) i, ii and iv are true
(c) only i and iv are true
(d) i, ii and iii are true

Answer: (b)

101. An unpolarised light beam is incident at an angle of 60° on a glass surface and after reflection it is linearly polarised. The approximate refractive index of the glass is

(a) 1.7
(b) 1.5
(c) 1.4
(d) 1.6

Answer: (a)

102. Avalanche breakdown in semiconductor diode occurs when the

(a) forward bias is more than knee voltage
(b) forward current exceeds a certain value
(c) reverse bias exceeds a certain value
(d) all above are incorrect

Answer: (c)

103. When a mass is rotating in a plane about a fixed point, its angular momentum is directed along

(a) The tangent to the orbit
(b) A line perpendicular to the plane of rotation
(c) A line making an angle of 45° to the plane of rotation
(d) The radius

Answer: (b)

104. On raising the temperature of pure semiconductor

(a) The number of free electrons and holes increases
(b) Fermi level moves towards conduction band
(c) Forbidden energy gap increases
(d) The resistance of semiconductor rises

Answer: (a)

105. In Stern-Gerlach experiment, if the spin of electron is considered to be 3/2 instead of 1/2, the difference in the number of splitting observed on the screen would be

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

Answer: (b)

106. Constructive interference occurs when the phase difference is

(a) 180°
(b) 0°
(c) 90°
(d) None of the above

Answer: (b)

107. In a common base configuration, current amplification factor is 0.9. If the emitter current is 1 mA, determine the value of base current.

(a) 0.9 mA
(b) 1.0 mA
(c) 1.1 mA
(d) 0.1 mA

Answer: (d)

108. Read the following statements about interferen and diffraction fringes and choose the correct option from the code given below.
1. In interference all bright fringes are of the s tensity but in diffraction intensity decreases with the increase in the order of the maxima.
2. Fringes of minimum intensity are perfectly dark in both the cases.
3. Interference fringes may or may not be of the same width but diffraction fringes are never of the same width.

(a) Only 1 and 2 are true
(b) Only 2 and 3 are true
(c) All are true
(d) Only 1 and 3 are true

Answer: (d)

109. The Coriolis force acts on objects that are

(a) Moving in a rotating reference frame
(b) Moving in a straight line
(c) Rotating
(d) At rest

Answer: (a)

110. The temperature of 5 g air is raised by 1°C at constant volume. Calculate the increase in its internal energy. (Given that C_v = 0.172 calg^{-1} °C^{-1} and J = 4.18 cal^{-1})

(a) 3.59 J

(b) 2.11 J

(c) 1.19 J

(d) 4.18 J

Answer: (a)

111. The output of a NAND gate is '0' only if

(a) All inputs are '1'

(b) All inputs except one are '0'

(c) All inputs except one are '1'

(d) All inputs are '0'

Answer: (a)

112. If the plane of polarisation is turned through 13.2°, then the specific rotation of sugar will be (Given that, the length of the tube is 20 cm and concentration of sugar solution is 10%)

(a) 33°

(b) 90°

(c) 180°

(d) 66°

Answer: (d)

114. Which of the following force is non-conservati n nature?

(a) Coulomb force

(b) Elastic force

(c) Frictional force

(d) Gravitational force

Answer: (c)

115. The principle of cyclotron is

(a) Induced acceleration

(b) Lorentz principle

(c) Coulomb's law

(d) Magnetic resonance acceleration

Answer: (d)

118. In semiconductor, current conduction is due to

(a) Holes and free electrons both

(b) Holes only

(c) Free electrons only

(d) None of the above

Answer: (a)

120. The establishment of a situation in which number of atoms in higher energy state is greater than that in lower energy state, is called

(a) Population inversion

(b) Stimulation process

(c) Spontaneous process

(d) None of the above

Answer: (a)

Answer key

Answer key from the Uttar Pradesh Public Service Commission's official answer key for this sitting. "—" means the key gave none.

Physics

41	**(c)**	42	**(a)**	43	**(b)**	44	**(a)**	45	**(d)**	46	**(b)**
47	**(a)**	48	**(c)**	49	**(a)**	50	**(a)**	51	**(d)**	52	**(b)**
53	**(a)**	54	**(a)**	55	**(c)**	56	**(d)**	57	**(b)**	58	**(d)**
59	**(b)**	60	**(c)**	61	**(c)**	62	**(c)**	63	**(b)**	65	**(a)**
68	**(b)**	69	**(b)**	70	**(a)**	71	**(a)**	72	**(b)**	73	**(b)**
74	**(a)**	75	**(c)**	76	**(a)**	78	**(a)**	79	**(b)**	80	**(d)**
82	**(b)**	83	**(a)**	84	**(b)**	85	**(c)**	86	**(c)**	87	**(b)**
88	**(b)**	91	**(b)**	92	**(b)**	95	**(b)**	97	**(c)**	98	**(a)**
99	**(b)**	100	**(b)**	101	**(a)**	102	**(c)**	103	**(b)**	104	**(a)**
105	**(b)**	106	**(b)**	107	**(d)**	108	**(d)**	109	**(a)**	110	**(a)**
111	**(a)**	112	**(d)**	114	**(c)**	115	**(d)**	118	**(a)**	120	**(a)**