

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

PG DEGREE EXAMINATION DECEMBER 2023
(Third Semester)

TRANS DISCIPLINARY COURSE
(Common to PG Programmes)

PHYSICS FOR MATHEMATICAL SCIENCES

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(5 x 1 = 5)

- 1 Which law is applicable for take-off rocket?
(i) Newtons first law (ii) Newtons second law
(iii) Newtons third law (iv) None of these
- 2 Which of the following criteria is used to choose a coordinate system?
(i) Distance (ii) Intensity
(iii) Magnitude (iv) Geometry
- 3 What is the constant in ideal gas equation?
(i) Universal gas constant (ii) Pressure constant
(iii) Temperature constant (iv) Boltzmann constant
- 4 Absorptivity of a body will be equal to its emissivity
(i) at all temperatures (ii) at one particular temperature
(iii) at critical temperature (iv) None of the above
- 5 According to Bohr's atom model the radius of orbit is directly proportional to
(i) n^2 (ii) $1/n$
(iii) $1/n^2$ (iv) n

SECTION - B (15 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(5 x 3 = 15)

- 6 a) Analyze the principles of Newton's first law with necessary example.
OR
b) Discuss the principle of Newton's third law with necessary example.
- 7 a) Illustrate the concept of conservation of momentum.
OR
b) Examine the concept of Spherical polar coordinates.
- 8 a) Elucidate the concept of Kinetic molecular model of ideal gas.
OR
b) Analyze the concept of vander waals equation.
- 9 a) Derive the expression of Plank's law.
OR
b) Elucidate the concept of black body radiation.
- 10 a) Illustrate the use of matrix in symmetric operation.
OR
b) Discuss in detail about the Lorentz transformation.

Cont...

SECTION -C (30 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks

(5 x 6 = 30)

- 11 a) Evaluate the muzzle velocity of bullet of newton's third law.
OR
b) Determine the expression for the force by Newton's second law of motion.
- 12 a) Analyze the concept dynamic of circular motion.
OR
b) Elucidate the concept of impulse and moment theory.
- 13 a) Derive the ideal gas equation.
OR
b) Enumerate the concept of heat capacity of gases.
- 14 a) Examine the black body spectrum with neat sketch.
OR
b) Formulate the numerical solution to Schrodinger's wave equation.
- 15 a) Analyze the atomic structure of Hydrogen molecule.
OR
b) Elucidate the concept of Bohr atom model.

Z-Z-Z

END