ZIAUDDIN UNIVERSITY
EXAMINATION BOARD

PHYSICS THEORY CLASS XII

TOTAL: 85 MARKS **TOTAL TIME: 2 HOURS**

SECTION A (42 MARKS)

THIS SECTION CONSISTS OF 42 MULTIPLE CHOICE QUESTIONS. EACH QUESTION CARRY ONE MARK.

i. The graph of pressure and volume of certain mass of a gas at constant temperature is a:

a) Parabola b) Hyperbola c) Straight line d) None of these

ii. The volume of a given gas at constant pressure becomes zero at:

a) 273K b) 273°C c) -273K d) -273°C

iii. A device which maintains the temperature is:

a)Thermometer b) Thermostat c) Calorie meter d) None of these

iv. The unit of co-efficient of thermal expansion is:

a) m K b) m / K c) K^{-1}

v. The process during which no external work is performed is:

a. a) Isothermal b) Isochoric c) Isobaric d) Adiabatic

b.

vi. In this process no heat enters or leaves the system

a. a) Isochoric b) Isobaric c) adiabatic d) Isothermal

vii. According to kinetic theory of a gases the absolute temperature of a perfect gas is

a) Directly proportional to average translations kinetic energy.
b) Directly proportional to both kinetic energy and potential energy.
c) Independent of the kinetic energy.
d) Inversely proportional to kinetic energy.

viii. The force per unit charge is known as:

a) Electric flux b) Electric field intensity c) Electric potential d) Electric current

ix. The flux through a surface is maximum when the angle between E and ΔA is:

a) 0^o b) 90^o c) 180^o d) 45^o

x. *The flux through a closed surface which does not contain any charge is:*

a) Infinite *b) Positive* *c) Zero* *d) Unity*

xi. *If the area of the plates of a parallel plates capacitor is doubled, the capacitance:*

a) is half *b) remains unchanged* *c) is increased four times* *d) is double*

xii. *If two capacitors of 5μF and 7μF are connected in parallel, their equivalent capacitance will be:*

a) 0.12 μF *b) 12 μF* *c) 0.34 μF* *d) 2.9 μF*

xiii. The rate of transfer of charges through a circuit is called.

a) Resistance b) Current c) Potential difference d) all of these

xiv. Ohm's Law is applicable only for:

a) Electrolytes b) Metallic conductors c) Semi conductors d) All of these

xv. A wire of length L and resistance R is cut into four equal pieces. Resistance of each piece would be:

a) R (b) R / 2 (c) 2 R (d) R / 4

xvi. 17 E.M.F. of a source in the absence of internal resistance is:

(a) I R (b) I R + I r (c) I r (d) I R – I r

xvii. 19 One Tesla is equal to:

a) 1 weber/ metre^2 b) 2 weber/ metre c)weber^2 / metre^2 d) Newton/ ampere

xviii. The S.I Unit of magnetic flux is:

a) Tesla b) Weber c) Gauss d) Ohm

xix. Upon which of the following magnetic field inside the solenoid does not depend.

(a) Permeability (b) Current
(c)Turns per length (d) Diameter of solenoid

xx. The magnetic field of induction within the core of toroid for the given value of current

(a) Directly proportional to the square of the radius of turns.
(b) Directly proportional to the radius of turns.
(c) Inversely proportional to the number of turns

(d) Directly proportional to the number of turns

xxi. When the coil is moved towards the magnetic poles then:

(a) Light will appear (b) Heat will produce
(c) No effect. (d) emf will induce in the coil.

xxii. Transformer works on

a. (a) Ohm's Law (b) Self induction
b. (c)Mutual Induction (d) Gauss's Law

xxiii. Sensitivity of Galvanometer is given by:

(a) CBAN (b) 1/ CBAN (c) C/ BAN (d) BAN / C

xxiv. This is a high resistance instrument:

a) Voltmeter b) Ammeter c) Galvanometer d) motor

xxv. The process of reducing amplitude of vibration of coil of galvanometer is called:

(a) Drifting (b) Shunting (c) Doping (d) Damping

xxvi. In frequency modulation, which one of the following of the original signal does not change:

(a) Pitch (b) Wave length (c) Frequency (d) Amplitude

xxvii. The semi conductor device which increases the strength of weak input signal at the output is a:

(a) N-type semi conductor (b) P-N diode
(c) Transistor (d) P-type semi conductor

xxviii. The three terminal devices, used as an amplifier is called.

(a) Diode (b) Transistor (c) Triode (d) P-type

xxix. This is not the result of special theory of relativity.

(a) Space-time transformation. (b) Relative mass
(c) Length contraction (d) Time dilation

xxx. According to the special theory of relativity space and time have:

(a) Absolute meaning (b) Relative meaning
(c) Selective meaning (d) None of these

xxxi. Which one of the following is correct for the inertial frame of reference?

(a) It is in uniform motion (b) It has zero acceleration
(c) Net force acting on it is zero (d) All of these

xxxii. The minimum light frequency required for photoelectric effect is called:

(a) Normal frequency (b) Cut – Off frequency
(c) Threshold frequency (d) Natural frequency

xxxiii. In Compton's scattering process, wave length of scattered X-rays.

(a) Remains same (b) Increases
(c) Decrease (d) None of these

xxxiv. The reverse process of pair production is known as:

(a) Annihilation (b) Anti pair production
(c) Materialization of matter (d) None of these

xxxv. According to the Bohr's theory angular momentum of electron is integral multiple of:

a. (a) h (b) $h / 2\pi$ (c) $2\pi / h$ (d) h / π

xxxvi. The first spectral line emitted in Lyman Series of Hydrogen atom when electrons falls from:

(a) n = 2 (b) n = 3 (c) $n = \infty$ (d) n = 1

xxxvii. Laser produces

a) An electron bea b) A neutron beam c) A coherent beam of light d) none of these.

xxxviii. The Principle of laser production is:

a. (a)spomtaneous emission (b)indeed absoption
b. (c)spontaneous absorption (d) stimulated emission
c.

xxxix. Half life of radioactive elements is given by:

(a) $0.693 / \lambda$ (b) 0.693 (c) 0.693λ (d) $\lambda / 0.$

xl. Wilson cloud chamber is used:

(a) For the study of clouds. (b) To produce x-rays
(c) To produce β - particles (d) To take photograph of the track of high velocity ions

xli. How three parallel resistors each of resistance 3 Ω could be connected with a 2 Ω resistor to have net resistance of 3 Ω:

(a) In series (b) In parallel (c) In complex network (d) Not in any way

xlii. Boyle's law is an example of:

a) Latent heat process b) Isothermal process c) Adiabatic process d) Mechanical process

SECTION B (SHORT ANSWER QUESTIONS) (24 MARKS)

Attempt any three questions from this section. Each question carries two parts and each part carries four marks

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02. a) *Define electric flux. Give conditions for maximum, minimum and negative electric flux*

b) A cylinder of diameter 1.00cm at 30^{o}C is to be slide into a hole in a steel plate. The hole has a diameter of 0.99970 cm at 30^{o}C. To what temperature must the plate be heated? α for steel = 1.1 x 10^{-5} $^{0}C^{-1}$.

03. a)State and explain Ohm's law?

b) An iron core solenoid with 500 turns has a cross section of 5 cm^2. A current of 2.3 ampere passing through it produces of flux of B = 0.53 Telsa. How large an e.m.f. is induced in it, if the current is turned off in 0.1 second? What is the self inductance of the solenoid?

04. a) Explain the construction and working of Wilson cloud chamber

b) Two resistances of 10 Ohms and 50 Ohms are connected in series with 6 volt battery calculate the charge drawn from the battery per minute and the power dissipated in10 Ohm resistance.

05. a) *State Coulomb's law and give the mathematical relation for the force between the charges*

b) The half life of $_{104}Po^{210}$ is 1 4 0 days. By what percent does its activity will decrease per week?

06. a) Define resistance and right down its units and factors

b) When 2000J of heat energy is supplied to a gas in a cylinder at constant pressure of $1.01x10^5$ N/m, the piston of area of cross-section 2 x 10^{-2} m^2 moves through 0.5m calculate the work done and the increase in the internal energy

SECTION C (DESCRIPTIVE - ANSWER QUESTIONS) (17 MARKS)

Attempt any 1 question from this section. Each question carries 19 marks

12-a) Describe the construction and working of a moving coil galvanometer?

12-b) Define transformer and derive relation between emf and terms. emf and current

12-c) What are the postulates of the special theory of relativity explain results of Einstein special theory of relativity

13-a) State Bohr's postulates? Derive an expression for the radius of the hydrogen atom? Derive an expression for the energy of the hydrogen atom?

13-b) Define Carnot engine? Describe Carnot cycle? Prove that efficiency of any engine is less than 100 percent?

13-c) *State and prove Gauss's law?*

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