PAPER CODE – 8475
12th CLASS – 1st Annual 2023

PHYSICS
GROUP : FIRST

OBJECTIVE

TIME: 20 MINUTES
MARKS: 17

NOTE: You have four choices for each objective type question as A , B , C and D . The choice which you think is correct, fill that circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero mark in that question.

QUESTION NO. 1 DGK-12-1-23

1	SI units of capacitive reactance are (A) Farad (B) Ohm (C) Volt (D) Ampere
2	Which of the following does not undergo plastic deformation ? (A) Glass (B) Copper (C) Wrought iron (D) Lead
3	For full–wave rectification , number of diodes used in bridge circuit is (A) 3 (B) 2 (C) 4 (D) 1
4	The SI units of current gain are (A) Volts (B) Ampere (C) Weber (D) No units
5	The Compton shift $\Delta\lambda$ is equal to Compton wave - length at an angle of (A) Zero (B) 90° (C) 45° (D) 120°
6	A single quantum of electromagnetic radiation is called (A) Photon (B) Meson (C) Positron (D) Quark
7	The reverse process of photo electric effect is called (A) Pair–production (B) Compton effect (C) Annihilation of matter (D) X–rays emission
8	Two down and one up quarks make (A) Proton (B) Photon (C) Neutron (D) Deutron
9	One Joule of energy absorbed per Kilogram of body is (A) Rem (B) Roentgens (C) Grey (D) Becquerel
10	The minimum charge on any object cannot be less than (A) 1.8×10^{-19} C (B) 3.2×10^{-19} C (C) 1.6×10^{-19} C (D) 9.1×10^{-19} C
11	An electric field can deflect (A) Neutrons (B) x–rays (C) Gama–rays (D) Alpha–rays
12	The SI units of the temperature coefficient of resistivity of a material are (A) Ohm–meter (B) Kelvin (C) Per Kelvin (D) Ohm–Kelvin
13	Which has High resistance ? (A) Ohm–meter (B) Ammeter (C) Galvanometer (D) Voltmeter
14	In order to increase the range of an ammeter , the shunt resistance is (A) Decreased (B) Increased (C) Kept constant (D) Randomly changed
15	The self inductance is given by the relation (A) $NL = \emptyset I$ (B) $NI = L\emptyset$ (C) $N = L I \emptyset$ (D) $N \emptyset = L I$
16	If speed of a generator is doubled , the output voltage will be (A) Same (B) One half (C) Four times (D) Double
17	The device which allows only the flow of D.C through a circuit is (A) Inductor (B) Capacitor (C) Transformer (D) A.C generator

D

12th CLASS – 1st Annual 2023

PHYSICS **SUBJECTIVE** **TIME: 2 HRS 40 MINUTES**
GROUP: FIRST DGK-12-1-23 **SECTION-I** **MARKS: 68**

QUESTION NO. 2 Write short answers any Eight (8) of the following 16

i	Suppose that you follow an electric field line due to positive point charge. Do electric field and potential increase or decrease ?
ii	Why the voltmeter should have very high resistance ?
iii	A particle which produce more ionization is less penetrating. Why ?
iv	Differentiate between electric potential and electric potential difference.
v	State amperes law. Give its significance.
vi	Charge particle α , β and γ – radiation produce fluorescence. Define fluorescence .
vii	Do electron tend to go to region of high potential or of law potential ?
viii	Give the working of xero – graphy.
ix	What do we mean that the term critical mass ?
x	How can you use a magnetic field to separate isotopes of chemical elements ?
xi	How can you make electronic trajectory visible , when calculating to charge to mass ratio ?
xii	Give two advantages and disadvantages of nuclear power.

QUESTION NO. 3 Write short answers any Eight (8) of the following 16

i	Explain why the terminal potential difference of battery decrease when current drawn from it is increased ?
ii	Is the filament resistance lower or higher in 500 w , 220 v light bulb than in 100 w , 220 v bulb ?
iii	What are the difficulties in testing whether the filament of a light bulb obeys ohm's law ?
iv	How does doubling the frequency affect the reactance of a capacitor ?
v	In a R-L circuit , will the current lag or lead the voltage ? Explain with vector diagram.
vi	What is resonance condition in R-L-C series circuit ?
vii	Distinguish between intrinsic and extrinsic semiconductors ?
viii	Discuss the mechanism of electric conduction by holes and electrons in semiconductors ?
ix	What are ductile and brittle substances ? Give and example of each.
x	What is the net charge on n-type or p-type substance ?
xi	Why charge carrier are not present in depletion region ?
xii	Define open loop gain of operational amplifier ?

QUESTION NO. 4 Write short answers any Six (6) of the following 12

I	Show that Lenz's law corresponds to law of conservation of energy.
ii	Show that ε and $\frac{\Delta\phi}{\Delta t}$ have the same units.
iii	Four unmarked wires emerge from a transformer. What steps would you take to determine the turn ratio ?
iv	Why don't we observe a Compton effect with visible light ?
v	Can pair production take place in vacuum ? Explain .
vi	How the results of special theory of relativity are used in NAVSTAR navigation system ?
vii	What is Steffen Boltzmann's law ? Write down the equation of Steffen Boltzmann's law.
viii	Can the electron in the ground state of hydrogen absorb a photon of energy 13.6 eV and greater than 13.6 eV ?
ix	Draw a graph of wavelength verses intensity showing the spectrum of continuous and characteristics x-rays.

SECTION-II

Note: Attempt any Three questions from this section 8 x 3 = 24

Q.5.(A)	Define electric potential and derive a relation for electric potential at a point due to a point charge.	5
(B)	A rectangular bar of iron is 2.0 cm by 2.0 cm in cross section and 40 cm long. Calculate its resistance if the resistivity of iron is 11×10^{-8} Ωm.	3
Q.6.(A)	Find an expression for a moving charge in the magnetic field.	5
(B)	The back emf in a motor is 120 V when the motor is turning at 1680 rev per minute. What is the back emf when the motor turns 3360 rev per minute ?	3
Q.7.(A)	What is rectification ? Explain full wave rectification. How pulsating output voltage is made smooth ?	5
(B)	A 10 mH, 20Ω coil is concocted across 240 V and $180/\pi$ Hz source. How much power do it dissipate ?	3
Q.8.(A)	Explain de Broglie hypothesis. How Davisson and Germer experimentally verified the de-Broglie hypothesis ?	5
(B)	A 1.0 m long copper wire is subjected to stretching force and its length increase by 20 cm. Calculate the tensile strain and percent elongation which the wire undergoes.	3
Q.9.(A)	Write the postulate of Bohr's atomic model of Hydrogen atom and show that how de-Broglie's hypothesis confirm one of its postulate.	2+3
(B)	A 75 kg person receives a whole body radiation dose of 24 m-rad, delivered by α-particles for which RBE factor is 12. Calculate (i) Absorbed energy in joules (ii) Equivalent dose in rem.	3

D