PHYSICS
GROUP: SECOND

DGK-G2-22
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

1	A charge of 4 C is in the field of intensity 4 N/C. the force on charge is
	(A) 1 N (B) 4 N (C) 8 N (D) 16 N
2	$\frac{Second}{ohm}$ is equal to
	(A) Farad (B) Coulomb (C) Joule (D) Ampere
3	5A current flows through a conductor in 2 minutes, the charge in the conductor is.
	(A) 10 C (B) 600 C (C) 400 C (D) 500 C
4	If current flowing through a solenoid becomes four times, then magnetic field inside it becomes.
	(A) Half (B) Two times (C) Three times (D) Four times
5	A 5m wire carrying current 2A at right angle to uniform magnetic field of 0.5 T. The force on the wire is.
	(A) 10 N (B) 5 N (C) 4 N (D) 2.5 N
6	Henry is equal to
	(A) VSA^{-1} (B) $VS^{-1}A$ (C) $V^{-1}SA$ (D) $V^{-1}S^{-1}A$
7	If step up transformer 100 % efficient, the primary and secondary windings would have the same
	(A) Current (B) Power (C) Voltage (D) Direction of winding
8	In R-L-C series circuit, the current at resonance frequency is
	(A) Zero (B) Minimum (C) Maximum (D) Infinite
9	The amplitude modulation transmission waves have frequencies range
	(A) 540 Hz to 1600 Hz (B) 540 M Hz to 1600 M Hz
	(C) 540 K Hz to 1600 K Hz (D) 540 Hz to 1600 K Hz
10	The Curi temperature for iron is
	(A) 125 °C (B) 163 °C (C) 750 K (D) 750 °C
11	Gain of inverting op-amplifier, if $R_1 = \infty$ and $R_2 = 1$
	(A) ∞ (B) +1 (C) -1 (D) 0
12	The p-n junction on forward biasing acts as
	(A) Capacitor (B) Inductor (C) High resistor (D) Low resistor
13	The unit of Plank's constant is
	(A) JC (B) J/C (C) JS (D) J/S
14	If temp. is doubled for a black body then energy radiated per second per unit area becomes.
	(A) 4 times (B) $\frac{1}{4}$ times (C) 16 times (D) $\frac{1}{16}$ times
15	The quantized radius of first Bohr orbit of Hydrogen atom is.
	(A) 0.053 nm (B) 0.053 m (C) 0.0053 nm (D) 0.53 nm
16	The dead time of G.M counter is
	(A) 10^{-3} second (B) 10^{-4} second (C) 10^{-6} second (D) 10^{-8} second
17	The temp. of core of sun is about
	(A) 50 M °C (B) 40 M °C (C) 20 M °C (D) 10 M °C

PHYSICS
GROUP: SECOND

SUBJECTIVE
SECTION-I DGK-G2-22

TIME: 2.40 HOURS
MARKS: 68

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

i	Suppose that you follow an electric field line due to a positive point charge. Do electric field and potential increased or decreased ?
ii	Do electron tend to go to region of high potential or low potential ?
iii	Define electric flux also write down its SI unit.
iv	Write down the four properties of electric field lines.
v	Is it possible to orient a current loop in a uniform magnetic field such that the loop will not tend to rotate ? Explain
vi	How can you use a magnetic field to separate isotopes of chemical element ?
vii	What is the function of grid ?
viii	Suppose that a charge 'q' is moving in a uniform magnetic field with velocity $\vec{v}$. Why is there no work done by the magnetic force acts on charge q ?
ix	Why are heavy nuclei unstable ?
x	Explain how α and β– particles may ionize an atom without directly hitting the electron ?
xi	What factors make a fusion reaction difficult to achieved ?
xii	If someone accidently swallows an α–source and a β– source which would be more dangerous to him ? Explain why ?

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

i	Colour code of carbon resistors, usually consists of four bands. Starting from left, interpret the different colour bands with example.
ii	What is meant by a current source ? Explain with example.
iii	Why does the resistance of a conductor rise with temperature ?
iv	Write down advantages and disadvantages of A.M. and F.M.
v	What is the difference between A.C. and D.C circuits ?
vi	A sinusoidal current has *rms* value of 10 A. What is the maximum or peak value ?
vii	Distinguish between soft and hard ferromagnetic materials.
viii	Describe the terms elasticity and plasticity.
ix	What is doping ? Why intrinsic semiconductors are doped ?
x	What are Logic gates ? Explain Logic OR – gate.
xi	The anode of a diode is 0.2V positive with respect to the cathode. Is it forward biased ?
xii	The inputs of a gate are '1' and '0'. Identify the gate if its output is (a) '0', (b) '1'. Verify the results using Boolean expressions or respective gates.

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

i	Write down any two methods for improving the efficiency of a transformer.
ii	On what factors the self inductance of a coil depends ? Explain briefly.
iii	Does the induced emf in a circuit depend on the resistance of circuit ? Does the induced current depend on the resistance of circuit ?
iv	Four unmarked wires emerge from a transformer. What steps would you take to determine the turns ratio?
v	Why can red light be used in a photographic dark room when developing films, but no white or blue light?
vi	What advantages an electron microscope has over an optical microscope ?
vii	Calculate the wavelength of an electron moving at 40 m/s
viii	Explain why laser action cannot occur without population inversion between atomic levels ?
ix	Write any two uses of lasers in medicine and industry.

SECTION-II

Note: Attempt any **Three (3)** questions from this section $8 \times 3 = 24$

Q.5.(A)	Describe Millikan's oil drop method for determination of charge on an electron.	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 resistivity of iron is 11×10^{-8} Ω m.	3
Q.6.(A)	Define and explain mutual induction. Also derived relation for mutual inductance ?	5
(B)	A power line 10.0m high carries a current 200 A. Find the magnetic field of the wire at the ground ?	3
Q.7.(A)	How op-amp can be used as inverting and non inverting amplifier ? Explain.	5
(B)	Find the value of the current flowing through a capacitance 0.5 μF when connected to a source of 150 V at 50 Hz.	3
Q.8.(A)	Explain strain energy in deformed material. Use graphical method to determine work done by force. Does this method suit to linear and non- linear extension ?	5
(B)	A particle of mass 5.0 mg moves with speed of 8.0 ms⁻¹. Calculate its de Broglie wavelength.	3
.(A)	What is the nuclear reactor ? Give its construction and working.	5
B)	Calculate the longest wave length of radiation for the Paschen series.	3