PAPER CODE - 8471

12th CLASS – 12022

D

PHYSICS **TIME: 20 MINUTES**

GROUP : FIRST **MARKS: 17**

OBJECTIVE

DGK - 91-22

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	$\frac{\text{Second}}{\text{Ohm}}$ is equal to. (A) Coulomb (B) Farad (C) Joule (D) Ampere
2	S.I unit of electric flux is. (A) $N\,C^{-1}$ (B) $N.m^2.C^{-1}$ (C) $N.m.C^{-1}$ (D) $N.C^{-1}.m^2$
3	If there is a single black colour band around the body of a resistor, then the value of its resistance will be. (A) Zero ohm (B) 10 ohm (C) 100 ohm (D) Infinity
4	If 300 turns of wire are wound on 30cm length, then number of turns per unit length is (A) 10 (B) 20 (C) 100 (D) 1000
5	Which of the following is not accurate potential measuring device ? (A) Voltmeter (B) C.R.O (C) Potentiometer (D) Digital multimeter
6	The rod of unit length is moving at 30° through a magnetic field of 1T. If the velocity of rod is 1 m/s , then induced emf in the rod will be. (A) 1 V (B) 0.25 V (C) 0.5 V (D) 0.6 V
7	In alternating current circuit, inductors behave like. (A) Semi conductors (B) Resistors (C) Insulators (D) Conductors
8	Resistance of pure choke is. (A) Zero (B) Large (C) Very small (D) Infinite
9	The device which allows only the flow of D.C. is. (A) Capacitor (B) Transformer (C) Inductor (D) Generator
10	Curie temperature for iron is. (A) 1153 K (B) 1023 K (C) 750 K (D) 700 K
11	If $R_1 = 10\ k\Omega$ and $R_2 = 100\ k\Omega$, the gain of inverting amplifier is (A) -11 (B) -10 (C) 10 (D) 11
12	The open loop gain of op-amp is of the order of. (A) 10^2 (B) 10^3 (C) 10^4 (D) 10^5
13	0.1 Kg is equivalent to the energy of. (A) 9×10^{15} J (B) 9×10^{16} J (C) 6×10^{16} J (D) 3×10^8 J
14	The rest mass energy of an electron positron pair is. (A) 0.51 Mev (B) 1.02 Mev (C) 0.2 Mev (D) 1.51 Mev
15	First spectral series of hydrogen atom was identified by. (A) Lyman (B) Rydberg (C) Balmer (D) Paschen
16	Slow neutrons can cause fission in. (A) Uranium - 235 (B) Uranium - 238 (C) Neptonium (D) Lithium
17	Radio therapy is generally done with γ-rays emitted from. (A) Sodium - 24 (B) Cobalt - 60 (C) Iodine - 131 (D) Strontium - 90

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PHYSICS
GROUP : FIRST

12th CLASS – 12022
SUBJECTIVE
SECTION-I DGK-91-22

TIME: 2.40 HOURS
MARKS: 68

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

i	The potential is constant throughout a given region of space. Is electric field zero or non zero in this region. Explain.
ii	Write any two comparisons of electric force and gravitational force.
iii	Calculate the electric intensity inside a hollow charged sphere.
iv	Electric lines of force never cross. Why ?
v	Write any two uses of C.R.O.
vi	Define current sensitivity of a galvanometer.
vii	Describe the change in magnetic field inside a solenoid carrying a steady current I, if length of solenoid is doubled and number of turns remains same.
viii	Why the resistance of ammeter should be very low ?
ix	Define nuclear reactor. Also write down its two main types of reactors.
x	Define fluorescence.
xi	Why are heavy nuclei unstable ? Explain briefly.
xii	Discuss the advantages and disadvantages of nuclear power as compared to the use of fossil fuel generated power.

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

i	Why does the resistance of a conductor rise with temperature ?
ii	Differentiate between ohmic and non-ohmic devices with example.
iii	Give statements of Kirchhoff's, 1st rule and 2nd rule.
iv	A sinusoidal current has *rms* value of 10A. What is the maximum or peak value ?
v	What is Choke ? Why is it used in A.C. circuit ?
vi	What is impedance ? Give its SI Units.
vii	Distinguish between crystalline and amorphous solids.
viii	What is meant by hysteresis loss ?
ix	Why ordinary silicon diodes do not emit light ?
x	The anode of a diode is 0.2V positive with respect to the cathode. Is it forward biased ?
xi	Differentiate between Forward and Reverse Biasing.
xii	Define elastic limit and yield point.

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

i	Define motional emf and write its formula ?
ii	Explain the factors responsible for powers loss in transistor ?
iii	Four unmarked wires emerge from a transformer. What steps would you take to determine the turn ratio?
iv	Does the induced emf in a circuit depend on the resistance of the circuit ? Does the induced current depend upon the resistance of the circuit ?
v	Give four applications of photocell ?
vi	Define work function and threshold frequency.
vii	Define special theory of relativity and write its postulates ?
viii	Distinguish between stimulated and spontaneous emission ?
ix	What are the advantages of laser over ordinary light ?

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SECTION-II

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

Q.5.(A)	Define capacitance of a capacitor. Derive an expression for the energy stored in the capacitor.	1+4
(B)	The resistance of an iron wire at 0 °C is 1×10^4 Ω. What is resistance at 500 °C of the temperature coefficient of resistance of iron is $5.2 \times 10^{-3}\ k^{-1}$.	3
Q.6.(A)	For a current carrying solenoid, derive expression for magnetic field. How can you explain the direction of magnetic field by right hand grip rule ?	5
(B)	An ideal step down transformer is connected with main supply of 240 V. It is desired to operate a 12 V, 30 W lamp. Find the current in the primary and the transformer ratio.	3
Q.7.(A)	What is the operational amplifier ? Derive the relation for gain of an inverting amplifier.	1+4
(B)	Find the capacitance required to construct a resonance circuit of frequency 1000 KHz with inductor of 5 mH.	3
Q.8.(A)	What is photoelectric effect ? How its results were explained by Einstein ?	1+4
B)	A 2.5m long and cross-section area $10^{-5}\ m^2$ is stretched 1.5 mm by a force of 100 N in the elastic region. Calculate (a) Strain (b) Young's modulus.	3
	Describe the principle, construction and working of Wilson Cloud Chamber for detection clear radiation.	5
	the speed of the electron in the first Bohr orbit.	3