(12th CLASS – 12018)

PHYSICS

SECOND GROUP (NEW COURSE)   TIME: 20 MINUTES

ACADEMIC SESSION: 2015-17 to 2016-18   MARKS: 17

OBJECTIVE

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	Identify the practical application of electrostatic force is			
	(A)Inkjet printer	(B) X - rays	(C) Laser	(D) A.C. generator
2	Product of resistance and capacitance is			
	(A) Velocity	(B) Force	(C) Acceleration	(D) Time
3	Kirchhoff's second rule is based on			
	(A) Energy conservation	(B) Mass conservation		
	(C)Charge conservation	(D) Momentum conservation		
4	Two parallel wires carrying current in the same direction			
	(A) Repel each other	(B) Have no effect upon each other		
	(C) Attract each other	(D) Cancel each other effect		
5	If the motor is overloaded then magnitude of back e m f			
	(A) Increase	(B) decrease	(C) Zero	(D) Remains constant
6	Choke consumes extremely small			
	(A) Current	(B) Charge	(C) Power	(D) Potential
7	Metal detector consists of			
	(A) L C circuit	(B) R L circuit	(C) R C circuit	(D) R L C series circuit
8	Good conductor have Conductivities of the order of			
	(A) $10^{-7}(\Omega\,m)^{-1}$	(B) $10^{7}(\Omega\,m)^{-1}$	(C) $10^{2}(\Omega\,m)^{-1}$	(D) $10^{-2}(\Omega\,m)^{-1}$
9	The Curi temperature of iron is			
	(A) 125 °C	(B) 163 °C	(C) 750 K	(D) 750 °C
10	The Boolean equation for exclusive NOR gate is given by			
	(A) $X = AB + BA$	(B) $X = A\bar{B} + \bar{B}A$	(C) $X = \overline{A\bar{B} + \bar{B}A}$	(D) $X = \overline{A\bar{B} + \bar{A}B}$
11	The potential barrier for silicon at room temperature			
	(A) 0.7 volt	(B) 0.3 volt	(C) 5 volt	(D) 1 volt
12	When platinum wire is heated it becomes orange at			
	(A) 500 °C	(B) 900 °C	(C) 1100 °C	(D) 1300 °C
13	1 Kg mass will be equivalent to energy			
	(A) 9×10^{12} j	(B) 9×10^{16} j	(C) 9×10^{20} j	(D) 9×10^{8} j
14	The value of Rydbergs constant is			
	(A) 1.0974×10^{7} m	(B) 1.0974×10^{-7} m^{-1}	(C) 1.0974×10^{7} m^{-1}	(D) 1.0974×10^{8} m^{-1}
15	Balmer series lies in			
	(A) Infrared region	(B) Visible region		
	(C) Ultraviolet region	(D) Far ultraviolet region		
16	The Y-rays emitted from radioactive element have speed			
	(A) 1×10^{7} m s^{-1}	(B) 1×10^{8} m s^{-1}	(C) 3×10^{8} m s^{-1}	(D) 4×10^{9} m s^{-1}
17	The dead time for G.M Counter is of the order of			
	(A) 10^{-1} S	(B) 10^{-2} S	(C) 10^{-3} S	(D) 10^{-4} S

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

1	Define electric flux, Gaussian surface.
2	Show $\frac{1V}{1m} = \frac{1N}{1C}$
3	If a point charge q of mass m released in a non-uniform electric field with field lines pointing in same direction, will it make a rectilinear motion?
4	Electric lines of force never cross .Why?
5	Define magnetic flux and solenoid.
6	What is the use of C.R,O. ?
7	How can you use a magnetic field to separate isotopes of chemical elements?
8	How can a current loop be used to determine the presence of a magnetic field in a region of space?
9	Show that ε and $\frac{\Delta\phi}{\Delta t}$ have the same units.
10	Can a D.C. motor be turned into a D.C. generator ? What changes are required to be done ?
11	State Lenz's law.
12	What are the factors on which mutual inductance of two coils depend ?

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

1	Do bends in a wire affects its electrical resistance? Explain.
2	Why does the resistance of a conductor rise with temperature?
3	What is difference between *emf* and terminal potential difference?
4	An alternating current is represented by equation I = 20 Sin 100 πt . Compute its frequency and *rms* value of current
5	What is meant by A.M. and F.M.?
6	How does doubling the frequency affect the reactance of (i) an inductor (ii) a capacitor?
7	Distinguish between crystalline and polymeric solids.
8	What is difference between Intrinsic and Extrinsic Semi-conductors?
9	A 1cm diameter cylinder is subjected to a load of 2500 gm. Calculate the stress on the bar in . megapascals
10	What is the net charge on a n-type or a p-type substance? Explain.
11	Why charge carriers are not present in the depletion region?
12	What is meant by forward and reverse biasing of a semi-conductor diode?

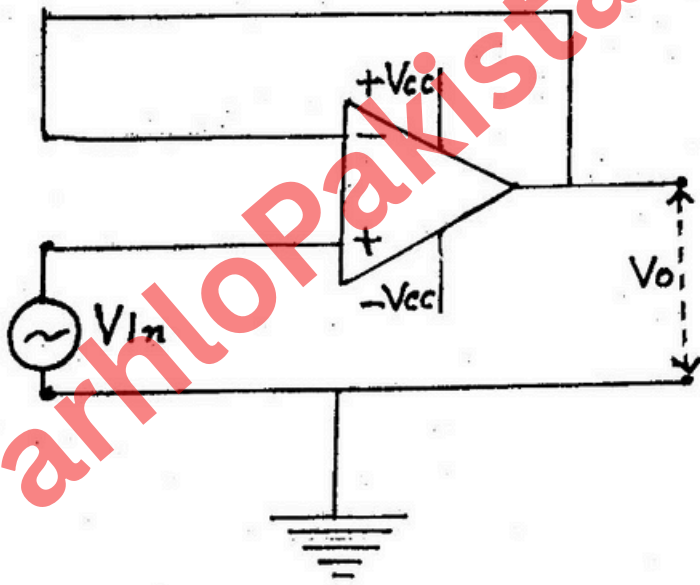**QUESTION NO. 4 Write short answers any Six (6) questions of the following** **12**

1	A particle produces more ionization is less penetrating. Why?
2	Explain how α and β particles may ionize an atom without hitting directly the electrons. What is difference in action of two particles for producing ionization?
3	What is meant by dose of radiation? What is its S.I. unit?
4	Write down two expected nuclear reactions for fission to indicate daughter nuclei?
5	An electron is placed in a box of an atom that is about 1.0×10^{-10}m. What is the velocity of that electron?
6	If an electron and proton have the same de-Broglie wavelength which particle has greater speed ? Explain
7	Write at least two justifications for light to behave as wave and as particle.
8	Bohr's theory of Hydrogen atom is based upon several assumptions. Do any of these contradict classical physics?
9	Write two uses of x- rays.

SECTION-II

Note: Attempt any Three (3) questions from this section

$8 \times 3 = 24$

5.(A)	Define capacitance. Derive an expression for capacitance of parallel plate capacitor when a dielectric material is inserted between the plates.	5
(B)	A platinum wire has a resistance of 10Ω at $0\,^{\circ}C$ and 20Ω at $273\,^{\circ}C$. Find the value of temperature co-efficient of resistance of platinum.	3
6.(A)	Define Lenz's law. On its basis prove the law of conservation of energy in case of movement of (i) bar magnet towards the coil. (ii) Metal rod placed on parallel metal rails in a uniform magnetic field.	1+2+2
(B)	A power line 10.0 m high carries a current of 200 A .Find the magnetic field of the wire at the ground	3
7.(A)	Draw the circuit diagram for R-L-C series resonating circuit .Discus the behavior of this circuit for A.C and also write down its properties.	1+2+2
(B)	Find the gain of the circuit as shown in given figure	3
8.(A)	What is meant by strain energy? How can it be determined from the force-extension graph?	1+4
(B)	A 90 Kev X-rays photon is fired at a carbon target and Compton scattering occurs. Find the wavelength of the incident photon and the wavelength of the scattered photon for scattering angle of 60°	3
9.(A)	What are isotopes? How isotopes are separated by mass spectrograph? On which factor abundance of isotopes depends ?	1+3+1
(B)	Calculate the longest wavelength of radiation for the Paschen series.	3