OGK

PAPER CODE - 8478
(12th CLASS – 12018)

PHYSICS
SECOND GROUP (NEW COURSE)
ACADEMIC SESSION: 2015-17 to 2016-18

TIME: 20 MINUTES
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	The Boolean equation for exclusive NOR gate is given by			
	(A) $X = A\overline{B} + \overline{B}A$	(B) $X = A\overline{B} + \overline{B}A$	(C) $X = \overline{A\overline{B} + \overline{B}A}$	(D) $X = \overline{A\overline{B} + \overline{A}B}$
2	The potential barrier for silicon at room temperature			
	(A) 0.7 volt	(B) 0.3 volt	(C) 5 volt	(D) 1 volt
3	When platinum wire is heated it becomes orange at			
	(A) 500 °C	(B) 900 °C	(C) 1100 °C	(D) 1300 °C
4	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
5	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}
6	Balmer series lies in			
	(A) Infrared region	(B) Visible region		
	(C) Ultraviolet region	(D) Far ultraviolet region		
7	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} $m\,s^{-1}$
8	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
9	Identify the practical application of electrostatic force is			
	(A)Inkjet printer	(B) X - rays	(C) Laser	(D) A.C. generator
10	Product of resistance and capacitance is			
	(A) Velocity	(B) Force	(C) Acceleration	(D) Time
11	Kirchhoff's second rule is based on			
	(A) Energy conservation	(B) Mass conservation		
	(C) Charge conservation	(D) Momentum conservation		
12	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		
13	If the motor is overloaded then magnitude of back e m f			
	(A) Increase	(B) decrease	(C) Zero	(D) Remains constant
14	Choke consumes extremely small			
	(A) Current	(B) Charge	(C) Power	(D) Potential
15	Metal detector consists of			
	(A) L C circuit	(B) R L circuit	(C) R C circuit	(D) R L C series circuit
16	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) $10^{-2}\,(\Omega\ m)^{-1}$
17	The Curi temperature of iron is			
	(A) 125 °C	(B) 163 °C	(C) 750 K	(D) 750 °C

4013 A/B

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QUESTION NO. 1

1 The magnetic force on an electron, travelling at 10^6 m/s parallel to the field of strength 1 Weber /m^2 is
(A) 10^{-12} N (B) Zero (C) 10^3 N (D) 16×10^{-12} N

2 The sensitivity of a galvanometer can be increased by:
(A)Decreasing the area of coil (B) Decreasing the number of turns
(C) Increasing the diameter of suspension wire (D) Increasing the magnetic field

3 Lens's law deals with the
(A) Magnitude of induced current (B) Direction of induced current
(C) Direction of induced emf (D) Magnitude of induced emf

4 Transformer is used to change
(A)Electrical power (B) Electrical energy (C) Magnetic field (D) Alternating voltage

5 In a resonance circuit of frequency 1000 KHz with inductor of 5mH, the capacitance will be
(A) 10.1 pF (B) 8.16 pF (C) 3.3 pF (D) 5.09 pF

6 The most suitable metal for making permanent magnet is
(A) Iron (B) Aluminium (C) Steel (D) Copper

7 Which component of the transistor has greater concentration of impurity?
(A) Base (B) Emitter (C) Collector (D) both emitter and collector

8 $X = \overline{A \cdot B}$ is the mathematical notation for
(A) NAND gate (B) NOR gate (C) OR gate (D) AND gate

9 In Compton scattering ,the value of Compton's shift is equal to Compton's wavelength, when X-rays is scattered at angle of
(A) 0^o (B) 30^o (C) 60^o (D) 90^o

10 The physical quantity ,related to photon, that does not change in compton scattering is
(A) Energy (B) Speed (C) Frequency (D) Wavelength

11 An electron in H-atom is excited from ground state to n = 4. How many spectral lines are possible in this case ?
(A) 6 (B) 5 (C) 4 (D) 3

12 The meta-stable state is..... than normal excited state.
(A) 10^{-5} times larger (B) 10^{-8} times smaller (C) 10^5 times larger (D) 10^{-3} times larger

13 The particles which do not experience strong force are called
(A) baryons (B) hadrons (C) mesons (D) leptons

14 The force which is responsible for the breaking up of the radioactive element, is
(A)Weak nuclear force (B) Strong nuclear force (C) Electromagnetic force (D) Gravitational force

15 If time constant in RC Circuit is small, than the capacitor is charged or discharged.
(A)Slowly (B) Rapidly (C) At constant rate (D) intermittently

16 Gauss's law can only be applied to
(A) A curved surface (B) A flat surface (C) A surface of any shape (D) A closed surface

17 The maximum power is delivered to a load resistance 'R' when the internal resistance of the source is
(A) Zero (B) Infinite (C) Equal to 'R' (D) Equal to $\frac{R}{2}$

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(12th CLASS - 12018)

ASICS
ROUP FIRST (NEW COURSE)
ADEMIC SESSION: 2015-17 to 2016-18

TIME : 2.40 HOURS
MARKS : 68

SUBJECTIVE
SECTION-I

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

1	The potential is constant throughout a given region of space. Is the electrical field zero or non-zero in region? Explain.
2	Do electrons tend to go to region of high potential or low potential? Explain.
3	Define electron field intensity. What is its unit and direction?
4	Define electric flux. Mention the factors upon which it depends.
5	Define Lorentz Force. Derive its formula.
6	What modification is required to covert a Galvanometer into Ammeter
7	What is Avometer ? Explain.
8	How can a current loop be used to determine the presence of a magnetic field in a given region of space?
9	Can a step-up transformer increase the power?
10	What happens when any meter is overloaded?
11	Name the factors which cause power loss in transformer.
12	Name the factors which affect the self induction.

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

1	Define resistivity and electrolysis.
2	Explain why the terminal potential difference of a battery decreases when the current drawn from it is increased?
3	Do bends in a wire affect its electrical resistance ? Explain.
4	What is meant by A.M and F.M?
5	A sinusoidal current has rms value of 10A .What is the maximum or peak value?
6	Define choke and electromagnetic waves.
7	What is meant by Dia and Ferromagnetic substances ? Give examples for each.
8	Define stress and strain.
9	What is meant by super-conductors ?
10	What is the net charge on a n-type or a p-type substance ?
11	Why ordinary silicon diodes do not emit light ?
12	Define digital system and logic gates.

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

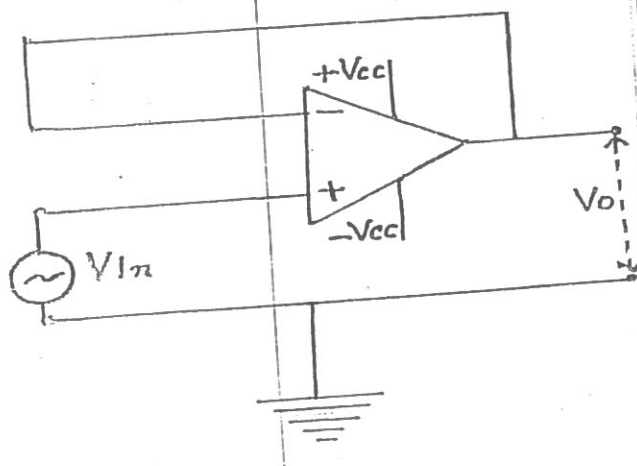
1	As a solid is heated and begins to glow, why does it first appear red?
2	Which has the lower energy quanta, Radio waves or X-rays ? Explain.
3	Why do not we observe a Compton effect with visible light ?
4	What do we mean when we say that the atom is excited?
5	State postulates of Bohr's Model of Hydrogen atom.
6	Define half life of radioactive element. How is it related with decay constant λ ?
7	What do you understand by " back ground radiation" ? State two source of the radiation.
8	What factors make fusion reaction difficult to achieve?
9	What fraction of a radioactive sample decays after two half lives have collapsed ?

P.T.O

SECTION-II

8 x 3 = 24

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

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 °C and 20Ω at 273 °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 behav or 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"	
9.(A)	What are isotopes? How isotopes are separated by mass spectrograph? On which factor abundance of isotopes depends ?	1+3+
(B)	Calculate the longest wavelength of radiation for the Paschen series.	

GK

PHYSICS (12th CLASS - 12018) TIME : 2.40 HOURS

SECOND GROUP (NEW COURSE) SUBJECTIVE MARKS : 68

ACADEMIC SESSION : 2015-17 to 2016-18 SECTION-I

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 $\mathcal{E}$ 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.

P.T.O

SECTION-II

Note: Attempt any Three questions from this section

5.(A)	Define capacitance of a capacitor. Also derive a relation for capacitance of a parallel plate capacitor for air and dielectric as a medium.	1+4
(B)	The resistance of an iron wire at 0 °C is 1.0×10^{4} Ω. What is the resistance at 500 °C if the temperature co-efficient of resistance of iron is $5.2 \times 10^{-3}\ K^{-1}$.	3
6.(A)	State Ampere's Law and derive the relation for field "B" of current carrying solenoid.	1+4
(B)	A square coil of side 16 cm has 200 turns and rotates in uniform magnetic field of magnitude 0.05 T. If the peak emf is 12V, what is the angular velocity of the coil?	3
7.(A)	What is modulation? Explain its two types	1+2+2
(B)	In the circuit shown in the figure below, there is negligible potential drop between B and E. Calculate (i) Base current (ii) Potential drop across R_C (iii) V_{CE}	3
8.(A)	What is de-Broglie hypothesis? How Davisson and Germer verify it ? Explain	2+3
(B)	A 1.0 m long copper wire is subjected to stretching force and its length increases by 20cm.Calculate the tensile strain and the percent elongation which the wire under goes?	3
9.(A)	What are postulates of Bohr's model of Hydrogen atom? Show that atomic radii in this atom are quantized?	2+3
(B)	If $^{233}_{92}U$ decays twice by $\propto$ — emission, what is the resulting isotope ?	3