**Pakistan School, Ministry of Education, Kingdom of Bahrain**

 **HSSC II- Pre-Board Exams, May 2021**

**Class:**  12th **Total Marks: 85**

**Subject: Physics Time Allowed: 20 minutes.**

**Student’s Name**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**NOTE**: *Section - A is compulsory. All parts of this section are to be answered on the question paper itself. It should be completed in the first 20 minutes and handed over to the Centre Superintendent. Deleting / overwriting are not allowed. Do not use lead pencil.*

#  SECTION –A (Marks 17)

# Q.1 Circle the correct option i.e. A/B/C/D. Each part carries one mark.

1. If the charge on the particle is double then electric field is:

 (a) Half (b) Double (c) Unchanged (d) None of these

1. Which of the following is correct:

 (a) J = C/V (b) J = V x A (c) J = V/A (d) J = C x V

1. Mass defect is always \_\_\_\_\_\_\_\_\_\_ then binding energy.

 (a) More (b) greater (c) both a& b (d) None of these

1. Tesla can be written as:

 (a)NAm-1 (b) NA-1m-1 (c) N-1Am-1 (d) None of these

1. A capacitor acts as blocking elements when applied signal is
2. A.C (b) D.C (c) Digital (d) None
3. Radiation having wavelength shorter than violet is called:

 (a) X-rays (b) infrared (c) ultra violet (d) r-rays

1. Xerography means

 (a) Type writing (b) Wet writing (c) Dry writing (d) None of these

1. A 25eV electron has a speed of

 (a) Tin (b) aluminum (c) lead (d) nickel

 **(P.T.O)**

1. The wire is wound on an iron core, its flux would.

 (a) Remain same (b) decrease (c) increase (d) be zero

1. The e.m.f. of two cells can be compared by

 (a) AVO meter (b) Voltmeter (c) Potentiometer (d) Weber

1. In a capacitor circuit at high frequency, the reactance will be.

 (a) High (b) low (c) zero (d) infinite

1. The magnetic induction of solenoid is

 (a) μo NL (b) μo N (c) μo NI (d) None of these

1. The force on a charge particle moving parallel to magnetic field is b. c. d.

 (a) Maximum (b) Minimum (c) Zero (d) None of these

1. For higher frequency, the XL will be.

 (a) High (b) low (c) zero (d) infinite

1. The forbidden gap in semiconductor is of the order of.

 (a) 5ev (b) 1 ev (c) 50 ev (d) 10 ev

1. The phase angle between A.C voltage and current through resistor is.

 (a) 0° (b) 45° (c) 90° (d) 180°

1. The dot product of magnetic field and area is called

 (a) Electric flux (b) Magnetic flux (c) Ampere’s law (d) None of these

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 **HSSC II- Pre-Board Exams, May 2021**

**Class:**  12th **Total Marks: 65**

**Subject: Physics Time Allowed: 2:40 hours.**

 **SECTION-B (marks 21)**

 **(Chapter 11 - 15)**

**Q.2 Answer any seven parts. The answer to each part should not exceed 3 to 4 lines.**

 **(7 x 3 = 21)**

1. Suppose you follow an electric field line due to a positive charge. Do the electric field and potential increase or decrease?
2. Is it possible to orient a current loop in a uniform magnetic field such that the loop will not tend to rotate?
3. If a charge particle moves in a straight line through some region of space can you say that the magnetic field in the region is zero?
4. What are the advantages of measuring potential difference with potentiometer?
5. Explain why the terminal potential difference of a battery decreases when the current drawn from it is increased?
6. Explain briefly the applications of charging and discharging of a capacitor?
7. An ordinary bulb is marked 70 watt, 220v, what is its resistance?
8. Describe conversion of galvanometer into ammeter with diagram?
9. What is the source of internal resistance of a cell?
10. Describe the principle of ECG?

 **(P.T.O)**

 **SECTION-C (marks 21)**

 **(Chapter 16 - 20)**

**Q.3 Answer any seven parts. The answer to each part should not exceed 3 to 4 lines: (7 x 3 = 21)**

1. Show that 1amu = 931Mev
2. If the speed of light were infinite, what would the equations of special theory of relativity be reduced to?
3. Which photon, red, green or blue carries the most? a) Energy b) Momentum
4. Why don’t we observe Compton Effect with visible light?
5. A particle which produces more ionization is less penetrating. Why?
6. Briefly explain how α and β - particles may ionize an atom without directly hitting

the electrons?

1. A particle of mass 5.0mg moves with speed of 8.0 ms-1.Calculate its de-Broglie wavelength.
2. What do we mean when we say that the atom is excited?
3. Why is the base current in a transistor very small? Discuss briefly
4. What do we mean by critical mass?

 **SECTION- D (marks 26)**

**Note: Attempt any two questions. All questions carry equal marks. (2 x 13= 26)**

**Q .3 (a)** State Kirchhoff’s rules. Explain Kirchhoff’s second rule in detail. (6)

 **(b)** Calculate the resistance of copper conductor having a length of 2 km and a cross-section of 22 mm2. Assume the resistivity is 18x10-9$Ω.m$. (4)

 **(c)** Differentiate between electromotive force and terminal Potential difference? (3)

 **Q.4 (a)** What is Mutual Induction? Explain how induced emf is produced in the secondary coil?(6)

 **(b)** A pair of adjacent coils has a mutual inductance of 1.5H. If the current in one coil changes from 0 to 20A in 0.5s, what is the change of flux linkage with the other coil? (4)

**(c)** Give the formulae for the flux linkage in terms of angular orientation? (3)

**Q. 5** **(a)** What is Compton's effect? How was the phenomena explained by AH Compton on the basis of particle theory of light. (6)

 **(b)** Find the threshold wavelength for a photon to produce an electron-positron pair. (4)

 **(c)** Define work function**.** (3)