AGA KHAN UNIVERSITY EXAMINATION BOARD

HIGHER SECONDARY SCHOOL CERTIFICATE

CLASS XII

ANNUAL EXAMINATIONS (THEORY) 2023

Physics Paper II

Time: 1 hour 30 minutes Marks: 35

INSTRUCTIONS

Please read the following instructions carefully.

1. Check your name and school information. Sign if it is accurate.

I agree that this is my name and school. **Candidate's Signature**

RUBRIC

2. There are TEN questions. Answer ALL questions. Questions 9 & 10 each offers TWO choices. Attempt any ONE choice from each.

3. When answering the questions:

   Read each question carefully.
   Use a black pointer to write your answers. DO NOT write your answers in pencil.
   Use a black pencil for diagrams. DO NOT use coloured pencils.
   DO NOT use staples, paper clips, glue, correcting fluid or ink erasers.
   Complete your answer in the allocated space only. DO NOT write outside the answer box.

4. The marks for the questions are shown in brackets ( ).

5. You may use a scientific calculator if you wish.

Q.1. (Total 3 Marks)

The electric field intensity of a point charge is 10 N/C at a distance of 5 m. Calculate the magnitude of the point charge.

(**Note**: The value of proportionality constant 'k' is 9×10^9 Nm^2/C^2.)

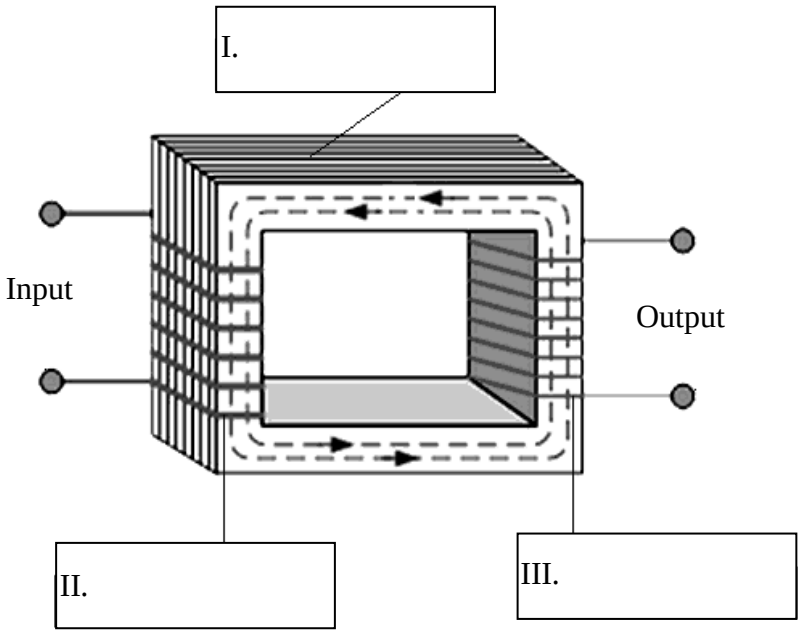
Q.2. (Total 3 Marks)

Is it possible to place a current carrying coil in a uniform magnetic field in such a manner that the coil will not be able to rotate?

Explain your answer with the help of a mathematical equation.

Q.3. (Total 3 Marks)

Label the given diagram of a transformer.



Q.4. (Total 2 Marks)

Explain how the reception of a particular radio station is selected on a radio set.

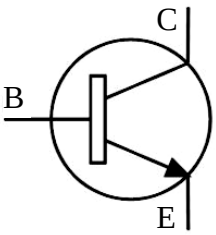
Q.5. (Total 2 Marks)

Differentiate between elastic and plastic deformations in solids.

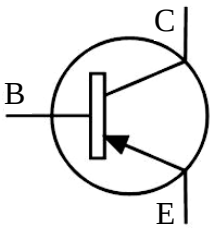
S. No.	Elastic Deformation	Plastic Deformation
1		
2		

Q.6. (Total 3 Marks)

a. Identify the following transistors. (1 Mark)



(I)



(II)

(I) _____

(II) _____

b. Write any TWO differences between the transistors identified in part (a). (2 Marks)

S. No.	I	II
1		
2		

Q.7. (Total 2 Marks)

Explain, in any TWO points, why laser action cannot occur without population inversion between atomic energy levels.

_____

_____

_____

_____

Q.8. (Total 3 Marks)

Explain, in THREE points, why it is more difficult to start a fusion reaction than a fission reaction.

Q.9. (Total 7 Marks)

EITHER

a. Given are three combinations of colour bands for three different resistors.

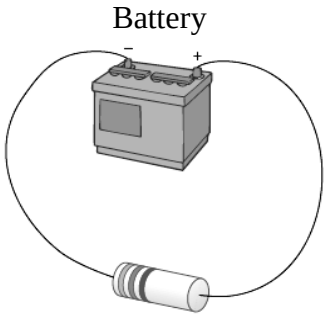
i. brown-blue-white
ii. black-black-violet
iii. grey-green-brown

Colour	Black	Brown	Red	Orange	Yellow	Green	Blue	Violet	Grey	White
Code	0	1	2	3	4	5	6	7	8	9

Calculate the values carbon resistance of all the given resistors and classify them as the highest, the lowest and an invalid resistor.

OR

b. The given diagram shows a source of e.m.f (ε) of internal resistance (r), connected to an external resistor of resistance (R).



Show that the power (P) delivered to the load resistance (R) is $P = \frac{\varepsilon^2 R}{(R+r)^2}$.

Q.10. (Total 7 Marks)

EITHER

a. Compare pair production and pair annihilation in SEVEN points. (7 Marks)

OR

b.

i. According to the photoelectric effect, does the number of ejected electrons depend upon the brightness (intensity) of incident light or upon the frequency of incident photons?

Justify your answer with TWO valid reasons. (3 Marks)

ii. Two different metals are used in photoelectric effect. Will their threshold frequency be the same? Give a statement to support your answer. (2 Marks)

iii. Does the intensity of incident light affect the maximum kinetic energy of the photoelectrons? Justify your answer. (2 Marks)

END OF PAPER

Please use this page for rough work

Please use this page for rough work

Please use this page for rough work

Please use this page for rough work