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RBSE

**RAJASTHAN BOARD OF
SECONDARY EDUCATION**

2023

**CLASS
XII**

Question Paper

Date: 20 March 2023 | TIME : (08:30 a.m. to 11:45 a.m)

Duration: 3 hr 15 min. | Max. Marks: 56






SUBJECT: PHYSICS

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To Know more : sms RESO at 56677 | Website : www.resonance.ac.in | E-mail : contact@resonance.ac.in | CIN : U80302RJ2007PLC024029

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This solution was download from Resonance Solution portal

Roll No.

Candidates must write the Code on the title page of the answer-book

SENIOR SECONDARY EXAMINATION, 2023

PHYSICS

Time Allowed : 3 hr, 15 Min.

Maximum Marks : 56

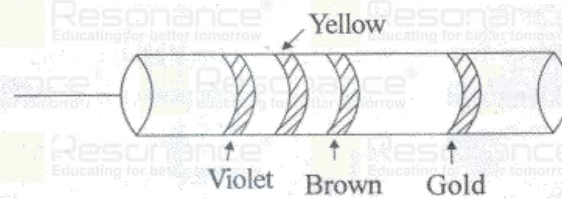
GENERAL INSTRUCTIONS TO THE EXAMINEES :

1. Candidate must write first his / her Roll No. on the question paper compulsorily.
2. All the questions are compulsory.
3. Write the answer to all questions in the given answer-book only.
4. For questions having more than one part, the answers to those parts are to be written together in continuity.
5. If there is any error/difference/contradiction in Hindi & English versions of the question paper, the question of Hindi version should be treated valid.
6. Write down the serial number of the question before attempting it.
7. There are internal choices in Question Nos. 19 & 20.

SECTION A

1. Choose the correct answer from multiple choice questions (i to ix) and write in given answer book.

- (i) The SI value of permittivity of free space or vacuum is - [1]
- (A) $9 \times 10^9 \text{ Nm}^2 \text{ C}^{-2}$ (B) $9 \times 10^{-9} \text{ Nm}^2 \text{ C}^{-2}$
- (C) $8.854 \times 10^{-12} \text{ C}^2 \text{ N}^{-1} \text{ m}^{-2}$ (D) $8.854 \times 10^{+12} \text{ C}^2 \text{ N}^{-1} \text{ m}^{-2}$
- (ii) Tolerance (%) for colour coded resistor in the following figure will be: [1]



- (A) 10% (B) 5% (C) 20% (D) 15%

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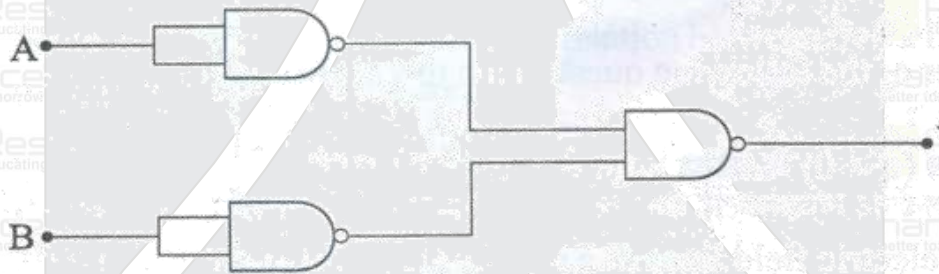
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- (iii) Curie temperature of iron is [1]
 (A) 1043K (B) 1143K (C) 893K (D) 317K
- (iv) Frequency of electric current of alternating current $I = 200 \sin \left(60\pi t + \frac{\pi}{6} \right)$ will be [1]
 (A) 120 Hz (B) 60 Hz (C) 90 Hz (D) 30 Hz
- (v) Communication frequency band range for FM broadcast is - [1]
 (A) 530 – 1710 MHz (B) 540 – 890 MHz (C) 88 – 108 MHz (D) 54 – 85 MHz
- (vi) What will be the focal length of a convex lens whose power is +2.5D ? [1]
 (A) 50 cm (B) 25 cm (C) 250 cm (D) 40 cm
- (vii) The path difference equivalent to 4π phase difference is - [1]
 (A) 8λ (B) 2λ (C) 6λ (D) 4λ
- (viii) De-Broglie wavelength associated with an electron, accelerated through a potential difference of 100 volt is [1]
 (A) 12.27 nm (B) 1.227 nm (C) 0.1227 nm (D) 122.7 nm
- (ix) The output (Y) of the logic circuit shown in the figure will be [1]



- (A) $Y = A+B$ (B) $Y = \overline{A+B}$ (C) $Y = A.B$ (D) $Y = \overline{AB}$

2. Fill in the blanks (i) to (iv)

- (i) A uniformly charged thin spherical shell has an electric field at all points _____ inside it. [1]
- (ii) On increasing the temperature, the resistivity of semiconductors is _____. [1]
- (iii) The force between two parallel current carrying conductor is _____. [1]
- (iv) In the primary rainbow, light is refracted _____ and internally reflected _____. [1]

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3. Give the answer of the following questions (i to viii) in one line:
- (i) Show the electric field lines due to a single positive charge ($q > 0$). [1]
 - (ii) Write the value of electric field due to an electric dipole at a point on its axis. [1]
 - (iii) Write two characteristics of a material to produce a permanent magnet. [1]
 - (iv) Select two paramagnetic material from the following: [1/2+1/2=1]
Sodium (Na), Bismuth (Bi), Copper (Cu), Aluminum (Al), Lead (Pb)
 - (v) Write the name of electromagnetic wave produced by vacuum tube magnetron. [1]
 - (vi) The radius of curvature of a concave mirror is 28cm, its focal length will be? [1]
 - (vii) Write the formula which shows the relation between fresnel distance wavelength of light and size of aperture. [1]
 - (viii) Write name of majority charge carriers and minority charge carries in p-type semiconductor. [1]

SECTION B






- 4. Calculate the electric potential at a point due to a charge of 2×10^{-9} C located 9×10^{-4} m away from it. [1^{1/2}]
- 5. Find the expression for electric potential energy of a system of three point charges. [1^{1/2}]
- 6. Current in a circuit falls from 5.0A to 1.0A in 0.1s. If an average e.m.f. of 200V induced. Give an estimate of the self-inductance of the circuit. [1^{1/2}]
- 7. Write statement for electromagnetic induction [3/4 +3/4 = 1^{1/2}]
(i) Faraday's law (ii) Lenz's law
- 8. Find out value of power factor for following circuit [3/4 +3/4 = 1^{1/2}]
(i) Purely capacitive circuit (ii) Series LCR resonance circuit
- 9. Describe any three energy losses in transformers. How these can be minimized explain? [1^{1/2}]
- 10. Define the following in photoelectric effect phenomenon [3/4 +3/4 = 1^{1/2}]
(i) work function (ii) stopping potential
- 11. If the work function of caesium metal is 2.14 eV then find its threshold frequency in Hz. [1^{1/2}]
- 12. The total energy of the electron in the ground state of Hydrogen atom is -13.6 eV. Find the kinetic energy and potential energy of electron in this state. [3/4 +3/4 = 1^{1/2}]
- 13. (i) Write two drawbacks of Rutherford's atomic model. [1 +1/2 = 1^{1/2}]
(ii) Name the series of the hydrogen spectrum whose lines fall in the visible region
- 14. Write the law of radioactive decay. The decay constant of a radioactive substance is 0.693 per minute. Calculate its half-life time in minute. [1/2 +1 = 1^{1/2}]
- 15. Define the following. [1/2 +1/2 +1/2 = 1^{1/2}]
(i) nuclear fusion
(ii) nuclear fission
(iii) mass defect

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SECTION C

16. Drawing a labelled circuit diagram of Wheat stone bridge, derive condition for zero deflection in the bridge. [1 + 2 = 3]
17. Obtain an expression for magnetic field on the axis of current carrying very long solenoid by Ampere's circuital law. Draw necessary diagram. [2 + 1 = 3]
18. To produce interference fringe pattern, draw a necessary diagram of young's double slit experiment. Derive an expression of fringe width for bright fringes.

SECTION D

19. Draw a ray diagram for image formation by concave mirror and establish a relation between object distance (u), image distance (v) and focal length (f). [1 + 3 = 3]

OR

Draw a ray diagram of light passing through a triangular glass prism. If prism

[1 + 3 = 3]

angle is A then deduce the relation $\mu = \frac{\sin\left(\frac{A + \delta m}{2}\right)}{\sin\left(\frac{A}{2}\right)}$

(where μ = refractive index of substance of prism and δm = minimum deviation)

20. What is rectification? Draw the circuit diagram of full wave rectifier and explain its working. Show the input ac voltage and output voltage waveforms from the rectifier circuit.

$$\frac{1}{2} + 1 + 1 \frac{1}{2} + \frac{1}{2} + \frac{1}{2}$$

OR

What is intrinsic semiconductor? Explain the processes of p-n junction formation with necessary diagram

Draw the symbol of the following diodes






- (i) Zener diode
- (ii) p-n junction diode

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CUET (UG)

2023

Common University Entrance Test



About CUET (UG)

Common University Entrance Test (CUET) is the program that provides equal opportunity to all students from different Boards & different region.

- CUET, known as Common Universities Entrance Test (CUET), is a Computer Based All - India Test for admission to various Undergraduate Programmes in 44 Central Universities and other State Private + Deemed Universities of India.
- CUET (UG) is organized by National Testing Agency (NTA).
- Official Website: <www.samarth.cuet.ac.in> OR <www.cuet.nta.ac.in>

Points to Remember: CUET (UG) 2023

- Candidates can choose any Language/Domain Specific Subjects/General Test or a combination as per the requirements of the course in the specific University.
- The choice of Tests/Subjects depend on the course/s chosen by the candidate and the University/ies where admission is sought.
- A Candidate can take a maximum of **10 tests**.



S.No.	SECTION	NO. OF QUESTIONS	QUESTIONS TO ATTEMPT	DURATION
1.	SECTION-I (A+B)	50	40	45 Minutes
2.	SECTION-II	50/45	40/35	45 Minutes*
3.	SECTION-III	60	50	45 Minutes*

*Not yet announced by NTA.

- **Section IA – 13 Languages (As a medium and “Language”)**

Assamese | Bengali | English | Gujarati | Hindi | Kannada | Malayalam | Marathi | Odia | Punjabi | Tamil | Telugu | Urdu

- **Section IB – 20 Languages**

Arabic | Bodo | Chinese | Dogri | French | German | Persian | Russian | Sindhi | Tibetan | Italian | Japanese | Kashmiri | Konkani | Maithili | Manipuri | Nepali | Santhali | Spanish | Sanskrit

- **Section II – 27 Domain-Specific Subjects**

There are 27 Domains specific Subjects being offered under this Section. Candidate may choose a maximum of Six (06) Domains as desired by the applicable University/Universities.

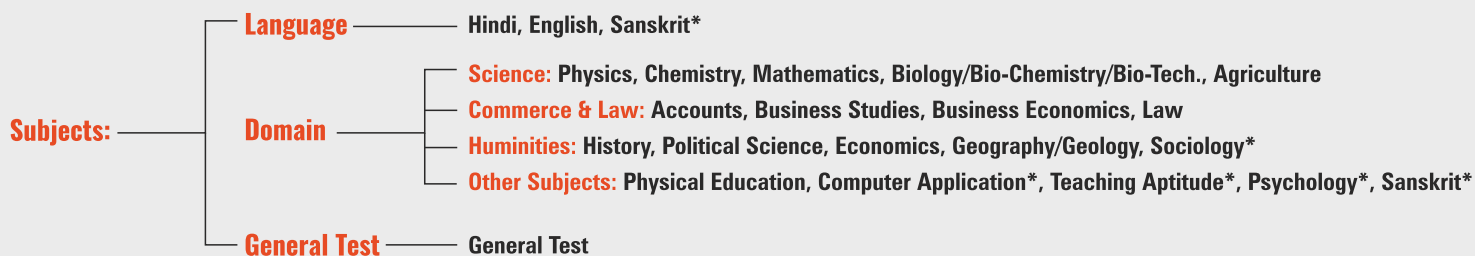
- **Section III – General Test**

General Knowledge, Current Affairs, General Mental Ability, Numerical Ability, Quantitative Reasoning (Simple application of basic mathematical concepts arithmetic/algebra geometry/mensuration/stat taught till Grade 8).

- Candidates, from any Stream (Arts / Commerce / Science), who are appearing in Class 12th Examination in 2022-23 OR who have Passed the class 12th or equivalent examination, irrespective of their age can appear in the CUET (UG)–2023.
- Students of Science stream can explore some unique courses of B. Tech/ M. Tech / Bio-Tech courses through CUET exam at some renowned universities of India like DU / BHU etc.
- Candidates have to fulfil the age criteria if it is specified by a Particular University to which the candidate wishes to apply.

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* Availability of these subjects depends on number of students enrolled.

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	PHASE-II	15 April to 20 May 2023
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