Sahaj Adhyayan (सहज अध्ययन)

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इतर विद्यार्थी मित्रांना त्या सर्वांचा उपयोग होईल.

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of Arts, Science & Commerce Baramati.

Terminal Examination Dec/Jan -2021-22

Sub:- PHYSICS

Std:- XI Science | Marks:- 50

Date:- 30/12/2021 | Time:- 10 to 12: 30

General Instructions:-

1. **Section A**:- Q. 1 contains **seven** multiple choice type of questions carrying **one** mark each. Q.2 contains **seven** very short answer type questions carrying **one** mark each.
2. **Section B**:- contains Q.3 to Q.13 contains **eleven** short answer type of questions carrying **two** marks each.
3. **Section C**:- contains Q.14 to Q.19 contains **six** short answer type questions carrying **three** marks each.
4. **Section D**:- contains Q.20 to Q.23 contains **four** long answer type questions carrying **four** marks each.
5. Use of only logtable is allowed.
6. For each MCQ correct answer must be written along with its alphabet.

Section A

Q. 1) Select and write the correct answer. [7]

i) $[M^1L^1T^{-1}]$ are the dimensions of.....

A) velocity B) momentum C)pressure D)displacement

ii) The SI unit of impulse is.....

A) N/s B) N/s^2 C) N.s D) $N.s^2$

iii) ..... is not a scalar quantity.

A) force B) temperature C) length D) time

iv) A force $\vec{f} = 3\hat{i} + 3\hat{j} + 3\hat{k}$ N acts in a body to produce a displacement $\vec{s} = 2\hat{i} + 3\hat{j} - 3\hat{k}$ m. The work done is.....

A) 20 J B) 15 J C) 12 J D) 6 J

v) In a series combination of cells, the effective internal resistance will....

A) remains the same B) decrease

C) increase D) be half that of first cell

vi) The SI unit of electric flux is.....

A) V/m B) V.m C) m/V D) m^2/V

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vii) The geometric length of a bar magnet having magnetic length 10 cm is.....

A) 4.2 cm B) 6 cm C) 10 cm D) 12 cm

Q. 2) Answer the following. [7]

i) SI unit of power is.....

ii) Percentage error = $\frac{\square}{a_{mean}} \times 100\ \%$

iii) Show that $\vec{A} = 2\hat{i} + 3\hat{j} - 4\hat{k}$ and $\vec{B} = 2\hat{i} + 4\hat{j} + 4\hat{k}$ are perpendicular to each other.

iv) Define temperature coefficient of resistance.

v) The permittivity of the medium is $26.55 \times 10^{-12}\ C^2/Nm^2$. Calculate the dielectric constant of the medium.
$(\varepsilon_0 = 8.85 \times 10^{-12}\ C^2/Nm^2)$

vi) Define the term magnetic declination.

vii) What is the value of internal resistance of ideal emf device?

Section B

Attempt any 8 of the following. (2 marks each) [16]

Q. 3) Write the dimensions of following physical quantities.
i) pressure ii) velocity

Q. 4) Using dimensional analysis prove that 1 newton = 10^5 dyne.

Q. 5) Distinguish between scalars and vectors.

Q. 6) Find 'a' if $\vec{A} = 3\hat{i} - 2\hat{j} + 4\hat{k}$ and $\vec{B} = a\hat{i} + 2\hat{j} - \hat{k}$ are perpendicular to each other.

Q. 7) What is triangle law of vector addition?

Q. 8) State SI unit and dimensions of electric field intensity.

Q. 9) A battery after a long use has an emf 24V and an internal resistance 120 Ω. Calculate the maximum current drawn from the battery.

Q. 10) What is the magnetic flux? State its unit.

Q. 11) Define unit of charge from the Coulomb's law.

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Q. 12) A bar magnet of magnetic moment 5 Am^2 has the poles 20 cm apart. Calculate the polestrength.

Q. 13) i) Define Electric lines of force.
ii) State Principle of superposition.

Section C

Attempt any 4 of the following. (3 marks each) **[12]**

Q. 14) What are the dimensions of the quantity $\sqrt{\frac{l}{g}}$, l being the length and 'g' is acceleration due to gravity.

Q. 15) If $\vec{P} = 2\hat{i} + 3\hat{j} - \hat{k}$ and $\vec{Q} = 2\hat{i} - 5\hat{j} + 2\hat{k}$, Find
i) $\vec{P} + \vec{Q}$ ii) $3\vec{P} - 2\vec{Q}$

Q. 16) Show that $\vec{P} \times \vec{Q} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ P_x & P_y & P_z \\ Q_x & Q_y & Q_z \end{vmatrix}$

Q. 17) Define the terms:- i) Axis of magnet
ii) Magnetic length
iii) Magnetic dipole

Q. 18) What is force between two small charges 2μC and -5μC separated by distance of 10 cm in air?($\frac{1}{4\pi\varepsilon_0} = 9 \times 10^9$ $SI\ unit$)

Q. 19) Explain the combination of cells in parallel.

Section D

Attempt any 2 of the following. (4 marks each) **[8]**

Q. 20) State the uses of dimensional analysis. Explain with example.

Q. 21) State and prove parallelogram law of vector addition and determine the magnitude and direction of resultant vector.

Q. 22) a) State and explain Coulomb's law in Electrostatics.
b) What is the force experienced by a test charge of 0.10 μC placed in an electric field of 1.6×10^6 N/C?

Q. 23) Derive an expression for the magnetic field due to a bar magnet at an arbitrary point.

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