

## JEE (Main) – Physics Sample Question Paper

<b>Subject</b>	Physics
<b>Total Number of Questions</b>	25
<b>Maximum Marks</b>	100
<b>Time Allowed</b>	60 Minutes

### Marking Scheme (As per JEE Main Pattern)

Each question carries **4 (four) marks**.

**1 (one) mark** will be deducted for each incorrect answer.

No marks will be deducted for unattempted questions.

Only one option is correct for each question.

### Important Instructions

1. This Question Paper consists of **25 Multiple Choice Questions** from **Physics** only.
2. All questions are compulsory.
3. Rough work should be done only in the space provided in the Question Paper.
4. Calculators, mobile phones, smart watches, or any electronic devices are strictly prohibited.

Name of the Candidate (Capital Letters)	
Roll Number	
Examination Centre Name	
Candidate's Signature	Date

Invigilator's Signature



7. Choose the incorrect statement from the given statements.
- A) Planets revolve around the Sun with constant linear speed.      B) Energy of the planet in elliptical orbit is constant.
- C) Satellites in circular motion have constant energy.      D) Body falling towards the Earth results in negligible displacement of the Earth.
8. An ice cube has a bubble inside. When viewed from one side the apparent distance of the bubble is 12 cm. When viewed from the opposite side, the apparent distance of the bubble is observed as 4 cm. If the side of the ice cube is 24 cm, the refractive index of the ice cube is
- A)  $\frac{4}{3}$       B)  $\frac{3}{2}$   
 C)  $\frac{2}{3}$       D)  $\frac{6}{5}$

9. Match the list-I with list-II and choose the correct option.

List-I	List-II
(A). Microwave	(P). 1 nm - 400nm
(B). Ultraviolet	(Q). 1 nm - 1nm
(C). X-rays	(R). 2.5 $\mu\text{m}$ - 750nm
(D). Infrared	(S). 1 $\mu\text{m}$ - 1nm

- A) A-(s), B-(q), C-(r), D-(p)      B) A-(s), B-(p), C-(q), D-(r)  
 C) A-(p), B-(s), C-(q), D-(r)      D) A-(r), B-(q), C-(s), D-(p)
10. A Carnot engine with efficiency 50% takes heat from a source at 600 K. In order to increase the efficiency to 70%, keeping the temperature of sink same, the new temperature of the source will be :
- A) 900K      B) 300K  
 C) 1000K      D) 360K
11. An electron of a hydrogen like atom, having  $Z = 4$ , jumps from 4<sup>th</sup> energy state to 2<sup>nd</sup> energy state. The energy released in this process, will be :  
 ( Given  $R_{ch} = 136eV$  )  
 Where  $R$  = Rydberg constant  
 $c$  = Speed of light in vacuum  
 $h$  = Planck's constant
- A) 40.8 eV      B) 3.4 eV  
 C) 10.5 eV      D) 13.6 eV
12. In which of the following process, the internal energy of gas remains constant
- A) Isothermal      B) Isochoric  
 C) Isobaric      D) Adiabatic
13. Which of the following physical quantities have the same dimensions?
- A) Electric displacement ( $\vec{D}$ ) and surface charge density      B) Displacement current and electric field  
 C) Current density and surface charge density      D) Electric potential and energy



22. Given below are two statements: one is labelled as Assertion *A* and the other is labelled as Reason *R*  
 Assertion (*A*): The nuclear density of nuclides  ${}^{10}_5\text{B}$ ,  ${}^6_3\text{Li}$ ,  ${}^{56}_{26}\text{Fe}$ ,  ${}^{20}_{10}\text{Ne}$  and  ${}^{209}_{83}\text{Bi}$  can be arranged as  $\rho_{\text{Bi}}^N > \rho_{\text{Fe}}^N > \rho_{\text{Ne}}^N > \rho_{\text{B}}^N > \rho_{\text{Li}}^N$ .  
 Reason *R*: The radius *R* of nucleus is related to its mass number *A* as  $R = R_0 A^{1/3}$ , where  $R_0$  is a constant.  
 In the light of the above statements, choose the correct answer from the options given below
- A) Both *A* and *R* are true and *R* is the correct explanation of *A*      B) *A* is false but *R* is true  
 C) Both *A* and *R* are true but *R* is NOT the correct explanation of *A*      D) *A* is true but *R* is false
23. *T* is the time period of simple pendulum on the earth's surface. Its time period becomes  $xT$  when taken to a height *R* (equal to earth's radius) above the earth's surface. Then, the value of *x* will be:
- A)  $\frac{1}{4}$       B) 4  
 C)  $\frac{1}{2}$       D) 2
24. An electron is moving along positive *x* direction in *xy* plane, magnetic field points in negative *z* direction, then the force due to magnetic field on electron points in the direction
- A) *j*      B)  $-j$   
 C) *k*      D)  $-k$
25. In a thermodynamic process work done by gas is 1000 J & heat supplied is 200 J. Find change in internal energy of gas?
- A) 800 J      B) -800 J  
 C) 1200 J      D) -1200 J

# JEE MAIN PHYSICS ANSWER KEY

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1. (B)	2. (B)	3. (D)	4. (B)	5. (B)
6. (B)	7. (A)	8. (B)	9. (A)	10. (C)
11. (A)	12. (A)	13. (A)	14. (C)	15. (A)
16. (B)	17. (B)	18. (D)	19. (D)	20. (B)
21. (A)	22. (B)	23. (D)	24. (B)	25. (B)