

# BITSAT 2026 April 15 (Shift-2)

## Question Paper (Memory-Based) PDF

Conducted by BITS Pilani



### General Instructions

- (i) **Duration:** The total duration of the examination is 3 hours (180 minutes).
- (ii) **Total Marks:** The complete paper carries a maximum of 390 marks.
- (iii) **Structure:** The paper has 4 Sections:
  - **Part 1:** 30 Multiple Choice Questions (Physics).
  - **Part 2:** 30 Multiple Choice Questions (Chemistry).
  - **Part 3:** 10 Multiple Choice Questions (English Proficiency),  
20 Multiple Choice Questions (Logical Reasoning)
  - **Part 4:** 40 Multiple Choice Questions (Mathematics/Biology)
- (iv) **Compulsory Questions:** All 130 questions are compulsory, and +12 Questions (Optional Extra Questions)
- (v) Each question has four options. Only **one** option is correct.
- (vi) **Correct Answer:** +3 marks.
- (vii) **Incorrect Answer:** -1 (Negative marking).
- (viii) **Unanswered/Marked for Review:** 0 marks.

### PHYSICS

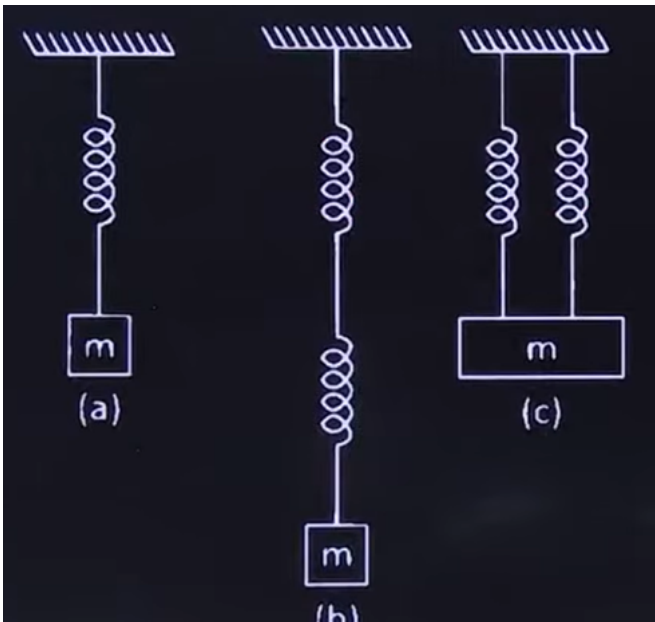
1. An ideal spring with spring-constant  $k$  is hung from the ceiling and a mass  $M$  is attached to its lower end. The mass is released with the spring initially unstretched. Then the maximum extension in the spring is

- (A)  $4Mg/k$
- (B)  $2Mg/k$
- (C)  $Mg/k$
- (D)  $Mg/2k$

2. In a mixture of gases, the average number of degrees of freedom per molecule is 6. The rms speed of the molecule of the gas is  $c$ , then the velocity of sound in the gas is

- (A)  $\frac{c}{\sqrt{3}}$
- (B)  $\frac{c}{\sqrt{2}}$
- (C)  $\frac{2c}{3}$
- (D)  $\frac{3c}{3}$

3. Five identical springs are used in the three configurations as shown in figure. The time periods of vertical oscillations in configurations (a), (b) and (c) are in the ratio.



- (A)  $1 : \sqrt{2} : \frac{1}{\sqrt{2}}$
- (B)  $2 : \sqrt{2} : \frac{1}{\sqrt{2}}$

- (C)  $\frac{1}{\sqrt{2}} : 2 : 1$   
(D)  $2 : \frac{1}{\sqrt{2}} : 1$
- 

4. A man of mass  $m$  starts falling towards a planet of mass  $M$  and radius  $R$ . As he reaches near to the surface, he realizes that he will pass through a small hole in the planet. As he enters the hole, he sees that the planet is really made of two pieces: a spherical shell of negligible thickness of mass  $3M/4$  and a point mass  $M/4$  at the centre. Change in the force of gravity experienced by the man is

- (A)  $\frac{3}{4} \frac{GMm}{R^2}$   
(B) 0  
(C)  $\frac{1}{3} \frac{GMm}{R^2}$   
(D)  $\frac{4}{3} \frac{GMm}{R^2}$
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5. A steel rod of diameter 1.0 cm is clamped firmly at each end when its temperature is  $25^\circ\text{C}$  so that it cannot contract on cooling. The tension in the rod at  $0^\circ\text{C}$  is ( $\alpha = 1 \times 10^{-5}/^\circ\text{C}$ ,  $Y = 2 \times 10^{11} \text{ N/m}^2$ )

- (A) 3925 N  
(B) 7000 N  
(C) 7400 N  
(D) 4700 N
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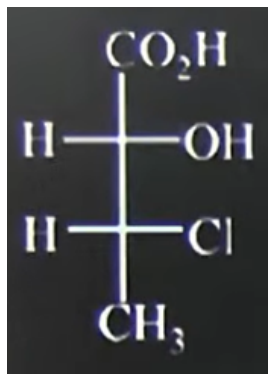
## CHEMISTRY

6. Half-life of zero order reaction  $A \rightarrow \text{product}$  is 1 hour, when initial concentration of reactant is  $2.0 \text{ mol L}^{-1}$ . The time required to decrease concentration of A from  $0.50$  to  $0.25 \text{ mol L}^{-1}$  is:

- (a) 0.5 hour  
(b) 4 hour
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- (c) 15 min  
(d) 60 min
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7. The absolute configuration of:



- (a) (2S,3S)  
(b) (2R,3R)  
(c) (2R,3S)  
(d) (2S,3R)
- 

8. The one giving maximum number of isomeric alkenes on dehydrohalogenation reaction is (excluding rearrangement):

- (a) 1-Bromo-2-methylbutane  
(b) 2-Bromopropane  
(c) 2-Bromopentane  
(d) 2-Bromo-3,3-dimethylpentane
- 

9. Pick the correct statement about electron and photon:

- (a) both electron and photons are fermions  
(b) electron is a fermion and photons are bosons  
(c) electron is boson and photons are fermions  
(d) both electron and photons are bosons
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10. Which hydride among the following is less stable?

- (a)  $\text{BeH}_2$
  - (b)  $\text{NH}_3$
  - (c)  $\text{HF}$
  - (d)  $\text{LiH}$
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**MATHEMATICS**

11. Let  $f(x) = \sin x$ ,  $g(x) = \cos x$ ,  $h(x) = x^2$  then

$$\lim_{x \rightarrow 1} \frac{f(g(h(x))) - f(g(h(1)))}{x - 1} =$$

- (A) 0
  - (B)  $-2 \sin 1 \cos(\cos 1)$
  - (C)  $\infty$
  - (D)  $-2 \sin 1 \cos 1$
- 

12. The variance of 20 observations is 5. If each observation is multiplied by 2, then the new variance of the resulting observation is

- (A)  $2^3 \times 5$
  - (B)  $2^2 \times 5$
  - (C)  $2 \times 5$
  - (D)  $2^4 \times 5$
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13. If  $A = \begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$ ,  $P = \begin{pmatrix} 1 & 1 \\ 0 & 1 \end{pmatrix}$  and  $X = APA^T$ , then  $A^T X^{50} A =$

- (A)  $\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$

(B)  $\begin{pmatrix} 2 & 1 \\ 0 & -1 \end{pmatrix}$

(C)  $\begin{pmatrix} 25 & 1 \\ 1 & -25 \end{pmatrix}$

(D)  $\begin{pmatrix} 1 & 50 \\ 0 & 1 \end{pmatrix}$

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**14. The locus of the mid-point of a chord of the circle  $x^2 + y^2 = 4$ , which subtends a right angle at the origin is**

(A)  $x + y = 2$

(B)  $x^2 + y^2 = 1$

(C)  $x^2 + y^2 = 2$

(D)  $x + y = 1$

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**15. If the system of linear equations  $2x + y - z = 7$ ,  $x - 3y + 2z = 1$ ,  $x + 4y + \delta z = k$  (where  $\delta, k \in \mathbb{R}$ ) has infinitely many solutions, then  $\delta + k$  is equal to:**

(A) -3

(B) 3

(C) 6

(D) 9

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