

MHT CET Physics Sample Questions

Question 1: A transverse wave is represented by $y = 2\sin(\omega t - kx)$ cm. The value of wavelength (in cm) for which the wave velocity becomes equal to the maximum particle velocity, will be

- (A) $4p$
- (B) $2p$
- (C) p
- (D) 2

Answer (A)

Question 2: A gas has n degrees of freedom. The ratio of the specific heat of the gas at constant volume to the specific heat of the gas at constant pressure will be

- (A) $n/(n+2)$
- (B) $(n+2)/n$
- (C) $n/(2n+2)$
- (D) $n/(n-2)$

Answer (A)

Question 3: A velocity selector consists of electric field $E = E\hat{k}$ and magnetic field $B = B\hat{j}$ with $B = 12$ mT. The value of E required for an electron of energy 728 eV moving along the positive x -axis to pass undeflected is

(Given, mass of electron = 9.1×10^{-31} kg)

- (A) 192 kVm⁻¹
- (B) 192 mVm⁻¹
- (C) 9600 kVm⁻¹
- (D) 16 kVm⁻¹

Answer (A)

Question 4: The mass numbers of two nuclei are in the ratio of 4 : 3. Their nuclear densities will be in the ratio of

- (A) 4 : 3
- (B) $(\frac{3}{4})^{\frac{1}{3}}$
- (C) 1 : 1
- (D) 3 : 3

Answer (C)

Question 5: The area of cross section of the rope used to lift a load by a crane is 2.5×10^{-4} m². The maximum lifting capacity of the crane is 10 metric tons. To increase the lifting capacity of the crane to 25 metric tons, The required area of cross section of the rope should be

- (take $g = 10$ ms⁻²)
- (A) 6.25×10^{-4} m²
- (B) 10×10^{-4} m²

- (C) $1 \times 10^{-4} \text{ m}^2$
(D) $1.67 \times 10^{-4} \text{ m}^2$
Answer (A)

Question 6: A body is projected vertically upwards from the surface of earth with a velocity equal to one third of escape velocity. The maximum height attained by the body will be:
(Take radius of earth = 6400 km and $g = 10 \text{ ms}^{-2}$)

- (A) 800 km
(B) 1600 km
(C) 2133 km
(D) 4800 km
Answer (A)

Question 7: The oscillating magnetic field in a plane electromagnetic wave is given by $B_y = 5 \times 10^{-6} \sin 1000\pi(5x - 4 \times 10^8 t) \text{ T}$.

The amplitude of the electric field will be:

- (A) $15 \times 10^2 \text{ Vm}^{-1}$
(B) $5 \times 10^{-6} \text{ Vm}^{-1}$
(C) $16 \times 10^{12} \text{ Vm}^{-1}$
(D) $4 \times 10^2 \text{ Vm}^{-1}$
Answer (D)

Question 8: The maximum and minimum voltage of an amplitude modulated signal are 60 V and 20 V respectively. The percentage modulation index will be:

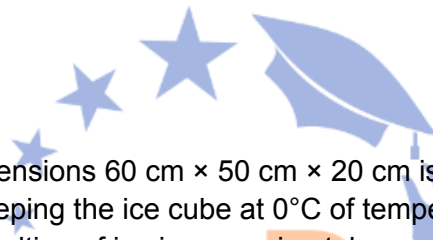
- (A) 0.5%
(B) 50%
(C) 2%
(D) 30%
Answer (B)

Question 9: A nucleus of mass M at rest splits into two parts having masses $M/3$ and $2M/3$ ($M' < M$). The ratio of de Broglie wavelength of two parts will be:

- (A) 1 : 2
(B) 2 : 1
(C) 1 : 1
(D) 2 : 3
Answer (C)

Question 10: An ice cube of dimensions 60 cm \times 50 cm \times 20 cm is placed in an insulation box of wall thickness 1 cm. The box keeping the ice cube at 0°C of temperature is brought to a room of temperature 40°C . The rate of melting of ice is approximately.

- (Latent heat of fusion of ice is $3.4 \times 10^5 \text{ J kg}^{-1}$ and thermal conducting of insulation wall is $0.05 \text{ Wm}^{-1}\text{C}^{-1}$)
(A) $61 \times 10^{-3} \text{ kg s}^{-1}$



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(B) $61 \times 10^{-5} \text{ kg s}^{-1}$

(C) 208 kg s^{-1}

(D) $30 \times 10^{-5} \text{ kg s}^{-1}$

Answer (B)

MHT CET Chemistry Sample Questions

Question 1: The diamagnetic metal complex is (Atomic number: Fe, 26; Cu, 29)

(A) $\text{K}_3[\text{Cu}(\text{CN})_4]$

(B) $\text{K}_2[\text{Cu}(\text{CN})_4]$

(C) $\text{K}_3[\text{Fe}(\text{CN})_4]$

(D) $\text{K}_4[\text{FeCl}_6]$

Answer (A)

Question 2: Hydrolysis of which compound will give carboic acid?

(A) Cumene

(B) Benzenediazonium chloride

(C) Benzal chloride

(D) Ethylene glycol ketal

Answer (B)

Question 3: Vulcanization of rubber is carried out by heating a mixture of

(A) isoprene and styrene

(B) neoprene and sulphur

(C) isoprene and sulphur

(D) neoprene and styrene

Answer (C)

Question 4: Animal starch is the other name of

(A) amylose

(B) maltose

(C) glycogen

(D) amylopectin

Answer (C)

Question 5: Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R.

Assertion A: Phenolphthalein is a pH dependent indicator, remains colourless in acidic solution and gives pink colour in basic medium.

Reason R: Phenolphthalein is a weak acid. It doesn't dissociate in the basic medium.

In the light of the above statements, choose the most appropriate answer from the options given below.

(A) Both A and R are correct and R is the correct explanation of A.

(B) Both A and R are correct but R is NOT the correct explanation of A

(C) A is correct but R is not correct

(D) A is not correct but R is correct

Answer C

Question 6: Haemoglobin contains 0.34% of iron by mass. The number of Fe atoms in 3.3 g of haemoglobin is

(Given: Atomic mass of Fe is 56 u, $N_A = 6.022 \times 10^{23} \text{ mol}^{-1}$)

(A) 1.21×10^5

(B) 12.0×10^{16}

(C) 1.21×10^{20}

(D) 3.4×10^{22}

Answer (C)

Question 7: Arrange the following in increasing order of their covalent character.

A. CaF_2

B. CaCl_2

C. CaBr_2

D. CaI_2

Choose the correct answer from the option given below.

(A) $B < A < C < D$

(B) $A < B < C < D$

(C) $A < B < D < C$

(D) $A < C < B < D$

Answer (B)

Question 8: Class XII students were asked to prepare one litre of buffer solution of pH 8.26 by their Chemistry teacher. The amount of ammonium chloride to be dissolved by the student in 0.2 M ammonia solution to make one litre of the buffer is

(Given : $pK_b(\text{NH}_3) = 4.74$, Molar mass of $\text{NH}_3 = 17 \text{ g mol}^{-1}$, Molar mass of $\text{NH}_4\text{Cl} = 53.5 \text{ g mol}^{-1}$)

(A) 53.5 g

(B) 72.3 g

(C) 107.0 g

(D) 126.0 g

Answer (C)

Question 9: At 30°C , the half life for the decomposition of AB_2 is 200 s and is independent of the initial concentration of AB_2 . The time required for 80% of the AB_2 to decompose is

(Given : $\log 2 = 0.30$, $\log 3 = 0.48$)

(A) 200 s

(B) 323 s

(C) 467 s

(D) 532 s

Answer (C)


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Question 10: The metal that has a very low melting point and its periodic position is closer to a metalloid is

- (A) Al
- (B) Ga
- (C) Se
- (D) In

Answer (B)

MHT CET Mathematics Sample Questions

Question 1: The angle of elevation of a jet plane from point A on the ground is 60° . After a flight of 20 seconds at the speed of 432 km/hour, the angle of elevation changes to 30° . If the jet plane is flying at a constant height, then its height is :

- (1) $3600(3)^{1/2}$
- (3) $2400(3)^{1/2}$
- (3) $1800(3)^{1/2}$
- (4) $1200(3)^{1/2}$

Solution (4)

Question 2: If P is a point on the parabola $y = x^2 + 4$ which is closest to the straight line $y = 4x - 1$, then the co-ordinates of P are :

- (1) (-2, 8)
- (2) (1, 5)
- (3) (3, 13)
- (4) (2, 8)

Solution (4)

Question 3: The probability that two randomly selected subsets of the set $\{1, 2, 3, 4, 5\}$ have exactly two elements in their intersection, is :

- (1) $65/2^7$
- (3) $135/2^9$
- (3) $65/2^8$
- (4) $35/2^7$

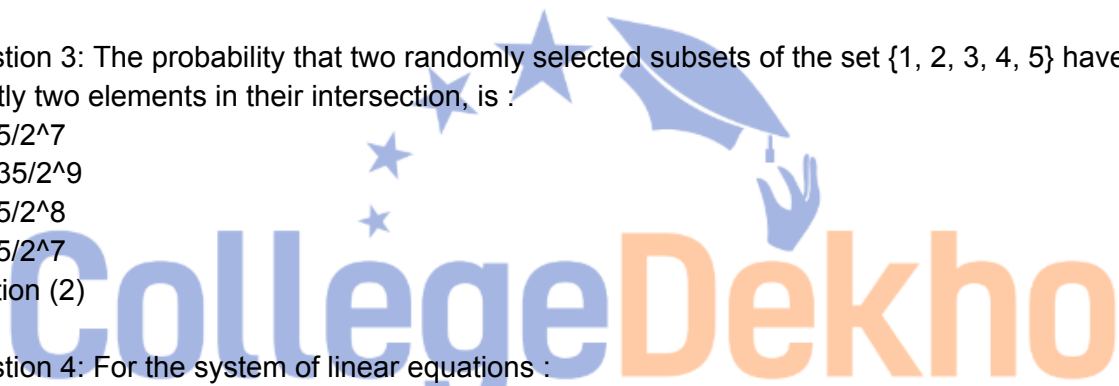
Solution (2)

Question 4: For the system of linear equations :

$x - 2y = 1$, $x - y + kz = -2$, $ky + 4z = 6$, $k \in \mathbb{R}$, consider the following statements :

- (A) The system has a unique solution: if k is not equal to 2, k is not equal to -2.
- (B) The system has a unique solution if $k = -2$.
- (C) The system has a unique solution if $k = 2$
- (D) The system has no solution if $k = 2$.
- (E) The system has an infinite number of solutions if k is not equal to -2.

Which of the following statements is correct?



- (1) (A) and (E) only
- (2) (A) and (D) only
- (3) (B) and (E) only
- (4) (C) and (D) only

Solution (2)

Question 5: If the curve $y = ax^2 + bx + c$, passes through the point (1, 2) and the tangent line to this curve at another origin is $y = x$, then the possible values of a, b, c are :

- (1) $a=1/2, b=1/2, c=1$
- (3) $a=1, b=0, c=1$
- (3) $a=1, b=1, c=0$
- (4) $a=-1, b=1, c=1$

Question 6: Let p and q be two positive numbers such that $p + q = 2$ and $p^4 + q^4 = 272$. Then p and q are the roots of the equation :

- (1) $x^2 - 2x + 2 = 0$
- (2) $x^2 - 2x + 8 = 0$
- (3) $x^2 - 2x + 136 = 0$
- (4) $x^2 - 2x + 16 = 0$

Solution (4)

Question 7: The system of linear equations

$$3x - 2y - kz = 10$$

$$2x - 4y - 2z = 6$$

$$x + 2y - z = 5m$$

is inconsistent if :

- (1) k is not equal to 3, m is not equal to $4/5$
- (2) k is not equal to 3
- (3) k is equal to 3, m is equal to $4/5$
- (4) k is equal to 3, m is not equal to $4/5$

Solution (4)

Question 8: A scientific committee is to be formed from 6 Indians and 8 foreigners, which includes at least 2 Indians and double the number of foreigners as Indians. Then the number of ways, the committee can be formed, is :

- (1) 560
- (2) 1050
- (3) 1625
- (4) 575

Solution (3)

Question 9: The equation of the plane passing through the point (1, 2, -3) and perpendicular to the planes $3x + y - 2z = 5$ and $2x - 5y - z = 7$, is:

- (1) $3x - 10y - 2z + 11 = 0$

$$(2) 6x - 5y - 2z - 2 = 0$$

$$(3) 6x - 5y + 2z + 10 = 0$$

$$(4) 11x + y + 17z + 38 = 0$$

Solution (4)

Question 10: An ordinary dice is rolled a certain number of times. If the probability of getting an odd number 2 times is equal to the probability of getting an even number 3 times, then the probability of getting an odd number for an odd number of times is :

$$(1) 3/16$$

$$(2) 1/2$$

$$(3) 1/32$$

$$(4) 5/16$$

Solution (2)

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