

JEE Main 2023 Question Paper with Answer Key

April 13 Shift 1 (Memory-based)

JEE Main 2023 Chemistry Question Paper

Question 1. Which of the following free radicals helps in depletion of the ozone layer?

- A. NO
- B. Cl
- C. OH
- D. CH₃

Answer. B

Question 2. In which of the following options the species changes from paramagnetic to diamagnetic and bond order increases.

- A. N₂ → N₂⁺
- B. O₂ → O₂⁺
- C. NO → NO⁺
- D. O₂ → O⁺

Answer. C

Question 3. Radius of the 2nd orbit of He⁺ is r₀. Radius of the 4th orbit of Be³⁺ is xr₀. Find x.

Answer. 2

Question 4. What happens when lyophilic sol is added to lyophobic sol. prevention from coagulation precipitation emulsion electrophoresis

- A. Prevention from coagulation
- B. Precipitation
- C. Emulsion

D. Electrophoresis

Answer. A

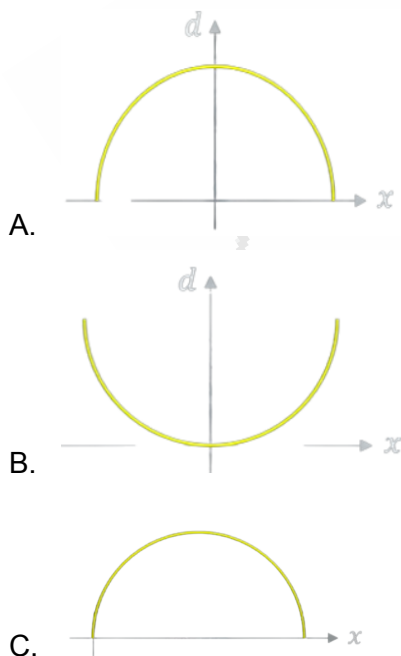
JEE Main 2023 Physics Question Paper

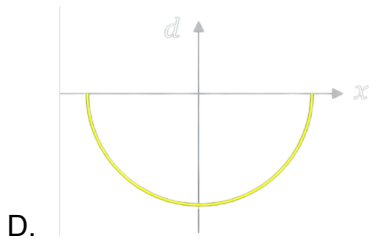
Question 1. If the height of the tower used for L.D.S is increased by 21% then percentage change in range is?

- A. 10%
- B. 21%
- C. 19%
- D. 42%

Answer. A

Question 2. Select the correct graph showing the difference (d) between total energy and potential energy of a particle in linear SHM with position x of the particle ($x = 0$ is the mean position)





Answer. A

Question 3. A dipole of charge 0.01C and separation 0.4mm, is placed in an electric field of strength 10 dyne/CC , Find the maximum torque exerted on the dipole in the field.

- A. $4 \times 10^{-9} \text{ Nm}$
- B. $2 \times 10^{-10} \text{ Nm}$
- C. $4 \times 10^{-10} \text{ Nm}$
- D. $2 \times 10^{-9} \text{ Nm}$

Answer. C

Question 4. Two bodies having the same linear momentum have a ratio of kinetic energy as 16:9. Find the ratio of masses of these bodies.

- A. 9/16
- B. 4/3
- C. 3/4
- D. 16/9

Answer. A

Question 5. What is the center of gravity of a semi-circular disc of radius (R)?

- A. $2R/\pi$
- B. $4R/3\pi$
- C. $R/2$
- D. $3R/8$

Answer. B

Question 6. Pressure for polytropic process P varies with volume V as $P = av^{-3}$, find out the bulk modulus.

- A. 3V

- B. $3P$
- C. P
- D. V

Answer. B

Question 7. The work function for two metals are 9eV and 4.5eV . Find the approx. difference between their threshold wavelength.(use $hc = 1240\text{ eV} \cdot \text{nm}$)

- A. 138 nm
- B. 130 nm
- C. 112 nm
- D. 145 nm

Answer. A

Question 8. If a wire of resistance R is connected across V_0 , then power is P_0 . The wire is cut into two equal parts and connected with V_0 individually, then the sum of power dissipated is P_1 , then P_0/P_1 is $1/x$. Find the value of x .

Answer. 4

Question 9. A particle is performing SHM having position $x = A \cos 30^\circ$, and $A = 40\text{ cm}$. If its kinetic energy at this position is 200 J , the value of force constant in (kN/m) is?

Answer. 10

Question 10. For the given radioactive decay ${}^{298}_{94}\text{X} \rightarrow {}^{294}_{92}\text{X} + {}^4_2\alpha + Q$ - value, binding energy per nucleon of X , Y and α are a , b and c . The Q - value is equal to

- A. $294b + 4c - 298a$
- B. $92b + 2c - 94a$
- C. $294b + 4c + 298a$
- D. $92b + 2c + 94a$

Answer. A

JEE Main 2023 Mathematics Question Paper

Question 1. Find the sum of series:

$2 \cdot 2^2 - 2 \cdot 3^2 + 2 \cdot 4^2 + \dots$ (20 terms)

- A. 462
- B. -462
- C. 460
- D. -460

Answer. D

Question 2. Let the number of matrices of order 3×3 are possible using the digits $[0, 1, 2, 3, \dots, 10]$ is m^n , then $(m + n)$ is _____. (where m is a prime number)

Answer. 20

Question 3. Remainder when 2^{2022} is divided by 15 is equal to__

Answer. 4

Question 4. The number of 7 digits numbers made using 1,2,3,4 whose sum of digits is 12 is?

- A. 413
- B. 311
- C. 308
- D. 393

Answer. A

Question 5. If $dy/dx = y+7$ and $y(0) = 0$, then the value of $y(1)$ is?

- A. $7(e - 1)$
- B. $2(e - 1)$
- C. $7e$
- D. None of these

Answer. A

Question 6. If $g(x) = \sqrt{x+1}$ & $f(g(x)) = 3 - \sqrt{x+1}$ then $f(0) = ?$

Answer. 3

Question 7. Find area bounded by the curves $y = \max\{\sin x, \cos x\}$ and x-axis between $x = -\pi$ and $x = \pi$

- A. $2 + \sqrt{2}$
- B. $\sqrt{2}$
- C. $1 + \sqrt{2}$
- D. $2\sqrt{2}$

Answer. D

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