

JEE Main 2023 Question Paper with Answer Key April 8 Shift 2 (Memory-Based)

JEE Main 2023 Physics Question Paper

Question 1. Which of the following is the highest electromagnetic wave?

- A. X-ray
- B. Infrared
- C. Microwaves
- D. Radiowave

Answer. A

Question 2. Which of the following expressions give the value of acceleration due to gravity (g') at the altitude h above the surface of Earth. (R = radius of Earth, g = acceleration due to gravity at surface of Earth)

- A. $g' = g (h^2/R^2)$
- B. $g' = g [R^2 / (R+h)^2]$
- C. $g' = g(1- h/R)$
- D. $g' = g(1- h^2/R^2)$

Answer. B

Question 3. Find the distance from a point of charge of magnitude 5×10^{-9} C, where the electric potential is 50 V

- A. 90 cm
- B. 70 cm

- C. 60 cm
- D. 50 cm

Answer. A

Question 4. A Carnot engine working between 27°C and 127°C performs 2 kJ of work. The amount of heat rejected is equal to:

- A. 4 kJ
- B. 6 kJ
- C. 8 kJ
- D. 12 kJ

Answer. B

Question 5. Match column I with column II and choose the correct option.

Column I	Column II
(I) Torque	(a) $M^{\circ}LT^{-2}$
(II) stress	(b) $ML^{-1}T^{-1}$
(III) Coefficient of viscosity	(c) $ML^{-1}T^{-2}$
(IV) Potential gradient	(d) ML^2T^{-2}

- A. I → a, II → c, III → b, IV → d
- B. I → d, II → b, III → c, IV → a
- C. I → d, II → c, III → b, IV → a
- D. I → a, II → c, III → d, IV → b

Answer. C

Question 6.

Statement —I : Electromagnets are made of soft iron.

Statement —II : Soft iron has lower permeability and high retentivity.

Choose the correct option related to statements.

- A. Statement — I is true but Statement — II is false
- B. Statement — I is false but Statement — II is true
- C. Statement — I is false and Statement — II is also false
- D. Statement —I is true and Statement —II is also true

Answer. B

Question 7. A body of mass 5 kg has the linear momentum of 100 kg ms⁻¹ and acted upon by the force of 2 N for 2 sec. Then change in kinetic energy in joule is

Answer. 81.6

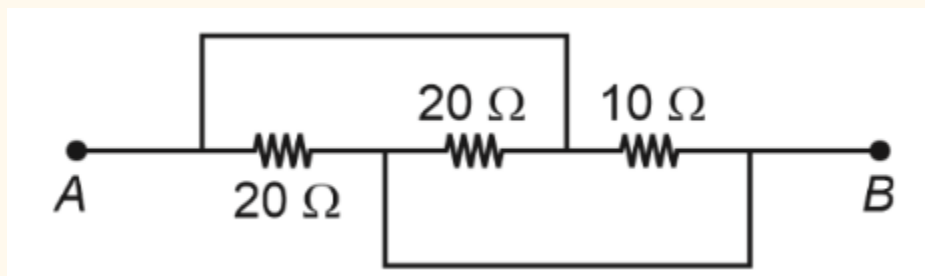
Question 8. The ratio of magnetic field due to coil at centre and at distance of R from the centre on the axis passing through the centre and perpendicular to the plane of ring is : 1x (R is the radius of coil), find the value of x.

Answer. 8

Question 9. Ratio of wavelengths of photons corresponding to first and second line of the Balmer series in an emission spectrum is given by x/20 for a hydrogen-like species. Value of x is equal to

Answer. 27

Question 10. The effective resistance in the following circuit across terminal A and B is equal to



- A. 5 Ω
- B. 10 Ω
- C. 20 Ω
- D. 40 Ω

Answer. A



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Question 1. Compounds of Xenon have one electron pair on central atom:

- A. XeO₃
- B. XeOF₂
- C. XeF₄
- D. XeF₅⁻

Answer. A

Question 2. Which of the following acts as a stabilizer in the decomposition of H₂O₂?

- A. Urea

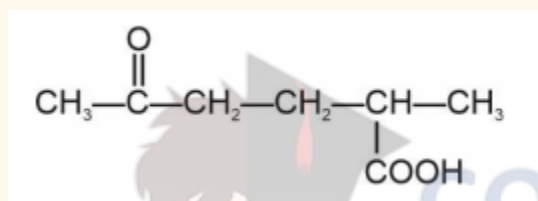
- B. Alkali
- C. Glass
- D. Dust

Answer. A

Question 3. What is the ratio of σ and pi bonds in pyrophosphoric acid?

Answer. 6:1

Question 4. IUPAC name of the compound?



Answer. 2-methyl-5-oxohexanoic acid

Question 5. Find out the oxidation number of the central metal atom of $\text{Fe}(\text{CO})_5$, VO^{2+} , and WO_3 . Then calculate the sum of their oxidation state.

Answer. 10

Question 6. Total spin only magnetic moment of the ion $[\text{Mn}(\text{SCN})_6]^{x-}$ is 5.92 B.M. Find out the value of x.

- A. 5
- B. 3
- C. 2
- D. 4

Answer. D

Question 7. Statement-1 : Methyl orange is a weak acid

Statement-2 : Benzenoid form of methyl orange is deeply coloured than quinonoid form

- A. Statement-1 is correct and Statement-2 is wrong
- B. Both the Statements-1 and Statement-2 are correct
- C. Statement-1 is wrong and Statement-2 is correct
- D. None of them

Answer. A

Question 8. K_{sp} of $BaSO_4$ is 8×10^{-11} . If the solubility in presence of 0.1 M $CaSO_4$ is?

Answer. 8

Question 9. How many of the following have five radial nodes? 5s, 6s, 7s, 6p and 4p

Answer. 6s

Question 10. In good quality cement ratio of lime total oxides of Si(SiO_2), Aluminium(Al_2O_3) and Iron(Fe_2O_3) should be as close as possible to_____.

Answer. 2

JEE Main 2023 Mathematics Question Paper

Question 1. The absolute difference of the coefficient of x^7 and x^9 in the expansion of $(2x + 1/2x)^{11}$ is?

- A. 11×2^5
- B. 11×2^7
- C. 11×2^4
- D. 11×2^3

Answer. B

Question 2. The area of the quadrilateral having vertices as (1,2), (5,6), (7,6), (-1,-6) is ?

Answer. 24

Question 3. Let $f(x) = \{1,2,3,4,5,6,7\}$, the relation $R = \{(x,y) \in A \times A, x + y = 7\}$ is

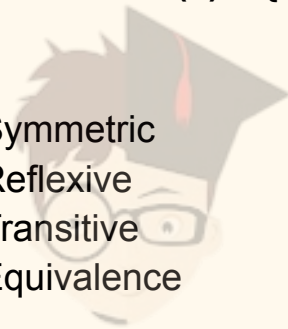
- A. Symmetric
- B. Reflexive
- C. Transitive
- D. Equivalence

Answer. A

Question 4. The number of words with or without meaning can be formed from the word MATHEMATICS where C, S does not come together is

- A. $9/8 \times 10!$
- B. $1/8 \times 10!$
- C. $5/8 \times 10!$
- D. $1/2 \times 10!$

Answer. A



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Question 5. The statement $(p \wedge (\sim q)) \vee (\sim p)$ is equivalent to?

- A. $p \wedge q$
- B. $\sim p \vee \sim q$
- C. $p \vee q$
- D. $\sim p \wedge \sim q$

Answer. B

Question 6. A parabola with focus $(3, 0)$ and directrix $x = -3$. Points P and Q lie on the parabola and their ordinates are in the ratio 3 : 1. The point of intersection of tangents drawn at points P and Q lies on the parabola

- A. $y^2 = 16x$
- B. $y^2 = 4x$
- C. $y^2 = 8x$
- D. $x^2 = 4y$

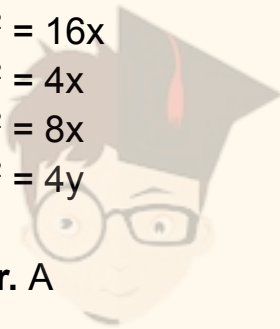
Answer. A

Question 7. If m is the number of solution of $x^2 - 12x + 31 + [x] = 0$ and n be the number of solution of $x^2 - 5|x+2| - 4 = 0$, then the value of $m^2 + mn + n^2$ is?

Answer. 19

Question 8. In probability distribution for discrete variable $x = 0, 1, 2 \dots$ $P(x = x) = k(x + 1) \cdot 3^{-x}$. The probability of $P(x \geq 2)$ is equal to?

- A. $5/18$
- B. $10/18$
- C. $20/27$
- D. $7/27$



Answer. D

Question 9. Let $R = \{a, b, c, d, e\}$ and $S = \{1, 2, 3, 4\}$. Then number of onto functions $f(x) : R \rightarrow S$ such that $f(a) \neq 1$ is?

- A. 240
- B. 180
- C. 204
- D. 216

Answer. B

Question 10. From $O(0, 0)$, two tangents OA and OB are drawn to a circle $x^2 + y^2 - 6x + 4y + 8 = 0$, then the equation of circumcircle of $\triangle OAB$.

- A. $x^2 + y^2 - 3x + 2y = 0$
- B. $x^2 + y^2 + 3x - 2y = 0$
- C. $x^2 + y^2 + 3x + 2y = 0$
- D. $x^2 + y^2 - 3x - 2y = 0$

Answer. A