

NEW STANDARD ACADEMY

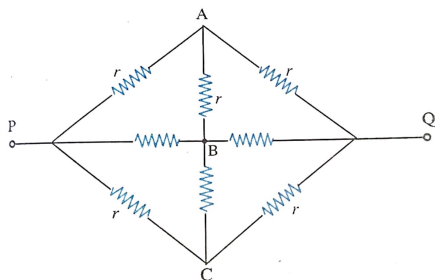
Date : 24-06-24

CLASS : 12TH JEE

Marks: 60
Time: 3 HRS

PHYSICS

1. Show on graph the variation of resistivity with temperature for a typical semiconductor Si
2. Two electric bulbs P and Q have their resistance in the ratio 1:2. They are connected in series across a battery. Find the ratio of the power dissipated in these bulbs.
3. A heating element is marked 210 V, 630 W. What is the value of current drawn by the element when connected to a 210 V dc source?
4. Define resistivity i.e. specific resistance of a material.
5. Write any two factors on which the internal cell depends
6. The voltage of clouds is 4×10^6 v with respect to ground. lightning strike lasting 100 ms, a charge of 4C is delivered to the ground. The power of lightning strike is
7. When a resistor of 11Ω is connected in series with an electric cell, the current flowing in it is 0.5A. Instead, when a resistor of 5Ω is connected to the same electric cell in series, the current increases by 0.4A. The internal resistance of the cell is
8. The equivalent resistance between the points P and Q in the network given here is equal to? (given, $r = 3/2 \Omega$)



9. When a current is passed in a conductor, 3 °C rise in temperature is observed. If the strength of the current is made thrice, then rise in temperature will approximately be?
10. The cell has an emf of 2V and internal resistance of this cell is 0.1Ω , it is connected to a resistance of 3.9Ω , the voltage across the cell will be?

CHEMISTRY

1. Why Zn^{2+} ion are colourless while Ni^{2+} ions are green and Cu^{2+} ions are Blue coloured?
2. Why do transition metal cation's have high enthalpy of hydration
3. Use hund's rule to derive the Electronic configuration of Ce^{3+} ion calculate its magnetic moment on the of spin formula only.
4. Compare the general characteristics of The First transition series. metals with those of the second and third series metals In the respective Vertical coloumns Give special emphasis on the following points
(i)Electronic configuration (ii) oxidation states

(iii) ionisation enthalpy (iv)Atomic size
5. Compare the stability of +2 oxidation states for the elements of the first transition leries
6. Which of the 3d series of the transition matals exhibits the largest number of oxidation states and why?
7. Give the reasons for the following
(i) E^0 value of (mn^{2+}/mn) is negative where as (Cu^{2+}/Cu) is positive
(ii)Actinoids show irregularities in their Electronic configuration
8. How would you account for the fact that the actinoids.
Exhibit a large number of oxidation states than corresponding lanthanoids?
9. Give seasons for the following

- (i) Mn_2O_3 is Basic whereas Mn_2O_7 is acidic
(ii) Transition metals form alloys.
10. $La(OH)_3$ is more basic than $Lu(OH)_3$.
Explain

MATHS

- If $[x]^2 - 5[x] + 6 = 0$, Where $[.]$ denotes the greatest integer function, then $x \in$
- The domain of the function $f(x) = \log_{3+x}(x^2-1)$ is
- Let $f(x) = ax + b$ and $g(x) = cx + d$, $a \neq 0, c \neq 0$. Assume $a = 1, b = 2$. If $(f \circ g)(x) = (g \circ f)(x)$ for all x , what can you say about c and d
- Evaluate $\lim_{x \rightarrow \infty} \left(1 + \frac{2}{x}\right)^x =$
- The value of $\lim_{x \rightarrow \infty} \sqrt{x} (\sqrt{x+c} - \sqrt{x})$ is
- The domain of the function $f(x) = \log(\sqrt{x-4} + \sqrt{6-x})$
- Evaluate $\lim_{x \rightarrow 0} \frac{\sec 5x - \sec 3x}{\sec 3x - \sec x}$ is
- Evaluate $\lim_{x \rightarrow \frac{\pi}{4}} \frac{\sqrt{2} \cos x - 1}{\cot x - 1}$
- The value of $\lim_{x \rightarrow \pi/4} \frac{\tan^3 x - \tan}{\cos(x + \frac{\pi}{4})}$ is
- The domain of $f(x) = \frac{\log(x^2+5x+6)}{[x]-1}$ is, where $[.]$ denotes the greatest integer function.