NEW STANDARD ACADEMY

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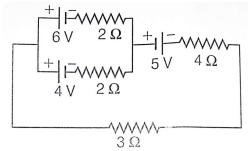
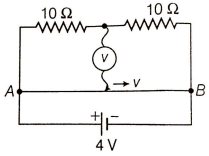
CLASS 12 (Academy) 26-05-2025

PHYSICS

1. For the given circuit the current through 6 V battery is

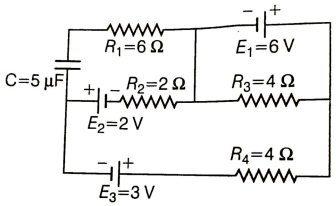


2. A meter bridge wire AB is 40 cm long and having a resistance of 50 Ω/m. An ideal voltmeter is touching the meter bridge wire as shown below



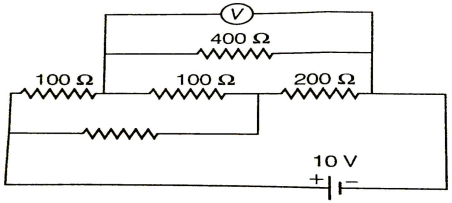
If reading with voltmeter is varying with time as V = 2 sin πt Then, velocity v of the jockey is
(assume negative terminal of battery is at 0 V)

3. For the given circuit,



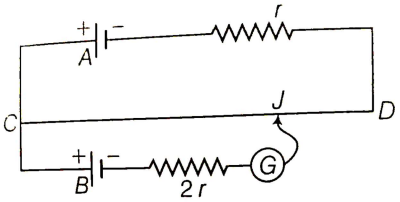
Energy stored in the capacitor in steady state is

4. For the given circuit.



Potential difference across 400 Q resistor measured by a voltmeter of 400 & resistor will be

5. in the potentiometer arrangement shown, the driving cell A has emf x and internal resistance r. The emf of cell B is x/2 and internal resistance is 2r. Potentiometer wire is 100 cm long.



If balance length C/ is greater than k x 10 cms, then the value of k will be

CHEMISTRY

1. Calculate the half-life of a first order reaction from their rate constants given below:
   (a) $200s^{-1}$ (b) $2min^{-1}$ (c) 4 $years^{-1}$
2. The half life for radioactive decay of ^{14}C is 5730 year An archaeological artifact containing wood had only 80% of the ^{14}C found in a living tree. Estimate the age of the sample.
3. The rate constant for a first order reaction is 60 sec^ -1 How much time will it take to reduce the initial concentration of the reactant to its $1/16^{th}$ value ?
4. A first order reaction takes 40 min for 30% decomposition. Calculate $t_{1/2}$
5. For the decomposition of azoisopropane to hexane and nitrogen at 543 K, the following data are obtained:

t (sec.)	*P* (mm of Hg)
0	35.0
360	54.0
720	63.0

Calculate the rate constant

BIOLOGY

1. What is diameter of chromatin thread?
2. Who given the biochemical characterisation of transforming principle
3. What is transformation give the example.
4. What are the conditions for genetic material?
5. Why RNA is butter genetic for material compare to DNA prove it
6. What is messelson and stal's experiment?
7. Who proved semiconsonatic mode of chromosome replication in eukaryates
8. What are major steps of DNA replication
9. What is important function of kornbery enzyme
10. What is difference between DNA polymerase II and DNA polymerase III

MATH

1. Find all points of discontinuity of f is defined by f(x) = $\begin{cases} \frac{|x|}{x} & if\ x \neq 0 \\ 0 & if\ x = 0 \end{cases}$.
2. Discuss continuity of *f(x)* = $\begin{cases} \frac{\tan x}{\sin x} & ; x \neq 0 \\ 1 & x = 0 \end{cases}$ at x=0.
3. What type of discontinuity *f(x)*= sin (log $_e$|*x*|), *x≠0*, and 1 if x=0 has at x=0?
4. If *f(x)* = x^3 and g(x) = sgn(x) , then discuss continuity of f(x)=f(x) .g(x) at x=0.
5. Find the points of discontinuity of *f(x)* = [2cosx],x∈ $[0,2\pi], where [.]$ represent greatest integer function.
6. Discuss continuity of *f(x)* = sgn(x($x^2$5x+6))
7. Discuss continuity of *f(x)* =$\begin{cases} \sin\ x & x\ is\ rational \\ \cos x & x\ is\ irrational \end{cases}$
8. Find the number of points where *f(x) = [x / 3] x ∈ [0, 30]* is discontinuous (where [.] represents the greatest integer function)
9. Find the number of points of discontinuity of *f(x)*=[tan^{-1} *x*], where [.] represents the greatest integer function.
10. Discuss continuity f(x) = sgn(*2cos x* - 1)