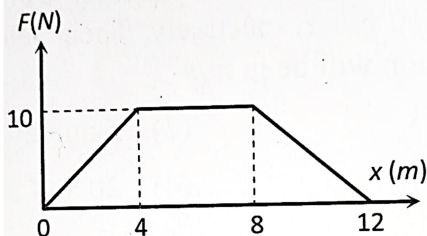


NEW STANDARD ACADEMY

SEMRI KOTHI SUPER MARKET, RAEBARELI

CLASS 11 (PHYSICS) DPP (Academy) 02/09/2024

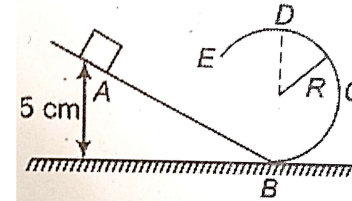
1. A force $(3\hat{i} + 4\hat{j})$ acts on a body and displaces it by $3\hat{i} + 4\hat{j}$ m. The work done by the force is ?
2. A block of mass 2 kg slipped up a slant plane requires 300 J of work. If height of slant is 10 m the work done against friction is
3. The momentum of a body is P and its kinetic energy is E. Its momentum becomes 2P. Its kinetic energy will be
4. A locomotive of mass m starts moving so that its velocity varies according to the law $v = \sqrt{s}$ where k is constant and s is the distance covered. Find the total work performed by all the forces which are acting on the locomotive during the first t seconds after the beginning of motion.
5. A metal ball hits a wall and does not rebound whereas a rubber ball of the same mass on hitting the wall the same velocity rebounds back. It can be concluded that
6. A particle of mass 0.1 kg is subjected to a force which varies with distance as shown in fig. If it starts its journey from rest at $x = 0$ its velocity at $x = 12$ m is



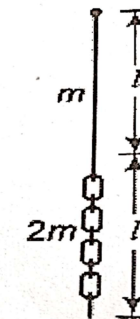
7. A uniform chain has a mass M and length L. It is placed on a frictionless table with length l hanging over the edge. The chain begins to slide down. Then, the speed with which the end slides down from the edge is given by
8. A body of mass m dropped from a certain height strikes a light vertical fixed spring of stiffness k. The height of its fall before touching the spring if the maximum compression of the spring is equal to $3mg/k$ is
9. A toy gun uses a spring of very large value of force constant k. When charged before being triggered in the upward direction, the spring is compressed by a small distance x. If mass of shot is m, on being triggered it will go up to a height of
10. A machine, which is 72 percent efficient, uses 36 joules of energy in

lifting up 1 kg mass through a certain distance. The mass is then allowed to fall through that distance. The velocity at the end of its fall is

11. A frictionless track ABCDE ends in a circular loop of radius R. A body slides down the track from point A which is at height $h = 5$ cm. Maximum value of R for a body to complete the loop successfully is

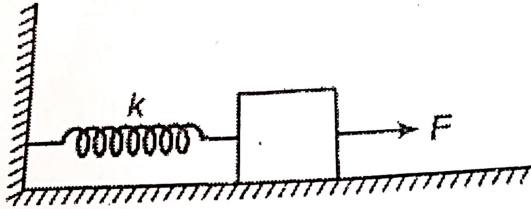


12. A rope of length l and mass 'm' is connected to a chain of length l and mass $2m$ and hung vertically as shown in figure. What is the change in gravitational potential energy if the system is inverted and hung from same point.

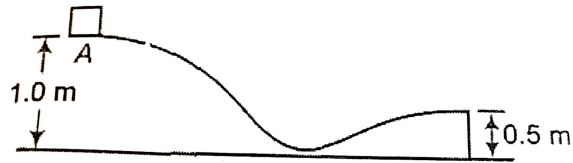


13. The string of a pendulum, is horizontal. The mass of bob attached to it is m. Now the string is released. The tension in the string in the lowest position, is
14. A particle of mass m is being circulated on a vertical circle of radius r. If the speed of particle at the highest point be v, then
15. A car moving at a speed v is stopped in a distance x by the friction between the tyres and the road. If the kinetic energy of the car is doubled, its stopping distance will be
16. An escalator is moving downwards with a uniform speed u. A man of mass m is running upwards on it at a uniform speed v. If the height of the escalator is h, the work done by the man in going up the escalator is
17. A block attached to a spring, pulled by a constant horizontal force, is kept on a smooth surface as shown in the figure. Initially, the spring is

in the natural state. Then the maximum positive work that the applied force F can do is [Given that spring does not break]



18. Figure shows a block sliding on a frictionless track which terminates in a straight horizontal section. If the block starts slipping from the point A, how far away from the track will the block hit the ground?



19. A body is moving down an inclined plane of slope 37° . The coefficient of friction between the body and plane varies as $\mu = 0.3x$, where x is the distance travelled down the plane by the body. The body will have maximum speed. ($g = 10 \text{ m/s}^2$) ($\sin 37^\circ = 3/5$)
20. If v, p and E denote velocity, linear momentum and KE of the particle, then

NEW STANDARD ACADEMY

SEMRI KOTHI SUPER MARKET, RAEBARELI
CLASS 11 (CHEMISTRY) DPP (Academy) 02/09/2024

1. Define equilibrium state and equilibrium constant.
2. What do you understand by reversible and irreversible reactions? Under what conditions a reversible reaction becomes irreversible ?
3. State and explain law of mass action and law of chemical equilibrium.
4. Why equilibrium constants have no units ?
5. Write the expression for equilibrium constant (K) for the general equation :
6. What is the difference between velocity constant and equilibrium constant ? Explain by giving mathematical equations.
7. Define Henry Law. Why the gas fizzes out when a soda water bottle is opened ?
8. Apply Le-Chatelier's principle to study the effect of temperature on following systems:
 - (a) Melting of ice,
 - (b) Evaporation of a liquid,
 - (c) Solubility of solids in liquids,
 - (d) Solubility of a gas in liquid.
9. State and explain Le-Chatelier's principle. Which factors can alter the equilibrium state ?
10. Discuss the effect of adding an inert gas in a system at equilibrium.
11. Establish the relation between K_p and K_c for the reaction:
$$m_1A + m_2B \rightleftharpoons n_1C + n_2D$$
12. What is the effect of catalyst on rate, rate constant and equilibrium constant?
13. What is the effect of temperature on rate, rate constant and equilibrium constant?
14. Define active mass. Derive the expression for the equilibrium constant of the reaction: $PCl_5 \rightleftharpoons PCl_3 + Cl_2$
15. In a vessel of 5 litre, 19 gram NH_3 , 0.16 gram H_2 and 3.4 gram N_2 are present at equilibrium. Calculate the equilibrium constant for the reaction:
$$N_2 + 3H_2 \rightleftharpoons 2NH_3$$
16. Write the factors (a) which change the value of equilibrium constant (b) which do not change the value of equilibrium constant.
17. Explain the dynamic nature of a chemical and physical equilibrium reactions.
18. Derive the relation $K_p = K_c(RT)^{\Delta n}$
19. A liquid is in equilibrium with its vapour in a sealed container at a fixed

temperature. The volume of the container is suddenly increased.

(a) What is the initial effect of the change on vapour pressure ?

(b) How do rates of evaporation and condensation change initially ?

20. A sample of HI (g) is placed in flask at a pressure of 0.2 atm. At equilibrium, the partial pressure of HI (g) is 0.04 atm. What is K_p for the given equilibrium?



NEW STANDARD ACADEMY

SEMRI KOTHI SUPER MARKET, RAEBARELI

CLASS 11 (MATH'S) DPP (Academy) 02/09/2024

1. Find the number of three-digit numbers having only two consecutive digits identical.
2. A variable name in certain computer language must be either an alphabet or an alphabet followed by a decimal digit. Find the total number of different variable names that can exist in that language.
3. Find the sum of the digits in the unit place of all numbers formed with the help of 3, 4, 5, 6 taken all at a time.
4. A shelf contains 20 different books of which 4 are in single volume and the others form sets of 8, 5 and 3 volumes. Find the number of ways in which the books may be arranged on the shelf, if the volumes of each set are together and in their due order.
5. Find the number of ways in which 8 different flowers can be strung to form a garland so that 4 particular flowers are never Separated.
6. Find the number of ways in which 6 gentlemen and 3 ladies be seated around a table so that every gentleman may have a lady by his side.
7. The total number of four-digit odd numbers that can be formed using 0, 1, 2, 3, 5, and 7 (repetition allowed) is
8. Five-digit numbers divisible by 3 are formed using 0, 1, 2, 3, 4, 5 without repetition. The total number of such numbers is.
9. A student is to answer 10 out of 13 questions in an examination such that he must choose at least four from the first five questions. The number of choices available to him is
10. The number of ways in which six men and five women can dine at a round table if no two women are to sit together is given by
11. How many ways are there to arrange the letters in the word GARDEN with the vowels in alphabetical order?
12. If the letters of the word SACHIN are arranged in all possible ways and these words are written out as in a dictionary, then the word SACHIN appears at serial number
13. The set $S = \{1, 2, 3, \dots, 12\}$ is to be partitioned into three sets A, B, C of equals size. Thus, $A \cup B \cup C = S, A \cap B = B \cap C = A \cap C = \varphi$. The number of ways to partition S is
14. How many different words can be formed by jumbling the letters in the word MISSISSIPPI in which no two S are adjacent?
15. There are two urns. Urn A has three distinct red balls and urn B has nine distinct blue balls. From each urn two balls are taken out at random and then transferred to the other, The number of ways in which this can be done is
16. Let $X = \{1, 2, 3, 4, 5\}$ The number of different ordered pairs (Y, Z) that can be formed such that $Y \subseteq X, Z \subseteq X$ and $Y \subseteq Z$ is empty, is
17. Ten different letters of an alphabet are given Words with five letters are formed from these given letters. The number of words which have at least one letter repeated is
18. Eight chairs are numbered 1 to 8 Two women and three men wish to occupy one chair each First, the women choose the chair from amongst the chairs marked 1 to 4, and then the men select the chair from amongst the remaining. The number of possible arrangements is.
19. In a group of boys, two boys are brothers and six more boys are present in the group. In how many ways can they sit if the brothers are not to sit along with each other?
20. A five-digit number divisible by 3 is to be formed using the digits 0, 1, 2, 3, 4, and 5, without repetition. The total number of ways this can be done is

NEW STANDARD ACADEMY

SEMRI KOTHI SUPER MARKET, RAEBARELI
CLASS 11 (BIOLOGY) DPP (Academy) 02/09/2024

1. In tropical rain forests, the canopy is thick and plants growing below receive filtered light. How are they able to carry out photosynthesis?
2. Why does the rate of photosynthesis decrease at higher temperatures?
3. Explain how during light reaction of photosynthesis, ATP synthesis is a chemiosmotic phenomenon
4. A cyclic process is occurring in C_1 plant, which is light dependent, and needs O_2 . This process doesn't produce energy rather it consumes energy.
5. Which is the universal green pigment found in green plants?
6. Who had discovered the phenomenon of red drop in green plants?
7. Who had shown that isolated chloroplast can produce ATP in presence of light?
8. In bacteria out of cyclic and non-cyclic reaction, which one is dominant?
9. Which is the richest protein on Earth?
10. The discovery of which process led to the understanding of inhibitory effect of O_2 on photosynthesis?
11. Name the phenomenon called for the destruction of chlorophyll in high light intensity.
12. O_2 evolved during photosynthesis comes from which substance?
13. Which one is the most important limiting factor in photosynthesis?
14. What led to the discovery of two photosystems (PS-I and PS-II)?
15. Which pigment system is not involved in photolysis of water and liberation of molecular oxygen?
16. Which is the first stable product of C_4 cycle?
17. Name the three C_4 plants which were first discovered?
18. What are antenna molecules in a photosynthetic unit?
19. What is a limiting factor?
20. Who proposed law of limiting factors?