

NEW STANDARD ACADEMY

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CLASS 11 (PHYSICS) DPP (Academy) 07/09/2024

- In a uniform circular motion, the direction of linear velocity is along the
 - Tangent to the curve path
 - Radius vector towards the centre
 - Perpendicular to the plane of the circular motion
 - Radius vector
- A satellite of the earth is revolving round the earth with a uniform speed 'v'. If the gravitational force suddenly disappears, the satellite will
 - Continue to move with the velocity v along the original orbit.
 - Move with a velocity v, tangentially to the original orbit.
 - Fall down with increasing velocity
 - Ultimately come to rest somewhere on the original orbit.
- For a particle performing UCM, the physical quantities are constant
 - Speed and angular velocity
 - Kinetic energy and radius vector
 - Angular velocity and Kinetic energy
 - 'a' and 'c'
- In a uniform circular motion, the velocity, position vector and angular velocity are
 - Parallel to each other
 - Mutually perpendicular to each other
 - They are co-planer
 - The angle between them 45°
- Angle between radius vector and centripetal acceleration is
 - 0°
 - π°
 - 2π°
 - None of these
- A particle is moving in a uniform circular motion with radius 'r', in half revolution the displacement
 - 2r, 2πr
 - 1.414r, 3.142r
 - 2r, πr
 - πr, 2r
- The ratio of the frequencies of rotation of the hour hand of a clock and the Earth is
 - 1: 12
 - 1: 2
 - 2:1
 - 12 : 1
- The ratio of the angular speed of the minute hand of a clock to that of its hour hand is
 - 3600 : 1
 - 60 : 1
 - 24 : 1
 - 12 : 1
- Which of the following quantities are constant for a body performing UCM?
 - The linear and angular velocities.
 - The linear speed and the acceleration
 - The linear velocity and the acceleration
 - The linear speed and the angular velocity
- The angular speed of the wheels of a bicycle is 8π rad/s. Their period of rotation is
 - 0.25 s
 - 0.4 s
 - π/4 s
 - 4s
- A particle describes a circular path of diameter 20 m every 2s. the average angular speed of the particle during 4s is
 - 20 π rad /s
 - 10 π rad /s
 - 5 π rad /s
 - π rad /s
- A car goes round a circular track of radius 50m with a speed of 25 m/s. its angular speed is
 - 0.5 rad/s
 - 2 rad/s
 - 5 rad/s
 - 1250 rad/s
- A belt passes over a wheel of radius 25 cm. if a point on the belt has a speed of 5 m/s, the belt is moving with an angular velocity of
 - 3.2 rad/s
 - 0.32 rad/s
 - 20 rad/s
 - 0.032 rad/s
- A bicycle wheel, 80 cm in diameter, is rotating at 120 rpm. The linear speed of the midpoint of a spoke is
 - 80π m/ s
 - 8.0π m/ s
 - 0.80 π m/ s
 - 0.80 / m s
- For a particle performing circular motion, the relation between its linear and angular velocities is
 - $\vec{v} = \vec{r} \times \vec{\omega}$
 - $v = r\omega$
 - $\vec{v} = \vec{\omega} r$
 - $\vec{v} = \vec{\omega} \times \vec{r}$
- Two cars, A and B, take the same time to go around two concentric tracks of radii R₁ and R₂, respectively. The ratio of the speed of car A to that of car B is
 - 1
 - R₁/ R₂
 - R₂/ R₁
 - 2
- The linear acceleration of a body performing uniform circular motion is given by
 - $\vec{a} = \omega \vec{r}$
 - $\vec{a} = -\omega \vec{r}$
 - $\vec{a} = \omega^2 \vec{r}$
 - $\vec{a} = -\omega^2 \vec{r}$
- A particles moves in a circular path of radius 10 cm with a constant speed of 10 cm/s. its acceleration is
 - 100cm/s²
 - 10 cm/s²
 - 1 cm/s²
 - Zero
- If a particle moves in a circular path with an angular velocity which is uniformly changing in magnitude, then it has
 - No centripetal acceleration

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- b) A constant centripetal acceleration plus a tangential acceleration
 - c) A tangential acceleration constant in magnitude and a centripetal acceleration which changes in magnitude
 - d) A constant tangential acceleration and a centripetal acceleration which increases in magnitude.
20. An object moving a circle will have an angular acceleration only if the net force on it
- a) Is entirely centripetal
 - b) Has a tangential component
 - c) Is entirely centrifugal
 - d) Is entirely tangential

1. Find the angle in radian through which a pendulum swings if its length is 75 cm and the the tip describes an arc of length 21 cm.
2. Find the radius of the in which a central a central angle of 60° intercepts an arc of 37.4 cm length.
3. Find the angle in radians between the hands of a cloc kat 7.20 p.m.
4. The perimeter of a certain sector of a circle is equal to the length of the arc of a semicircle having the same radius . Find the angle of the sector in degrees. (Take $\pi = \frac{22}{7}$)
5. An engine is travelling along a circular railway track of radius 1500 metres with a speed of 60 km/h. Find the angle in degrees turned by the engine in 10 seconds.
6. If the arcs of the same length in two circles subtend angles of 65° and 110° at their respective centres, find the ratio of their radii.
7. Large hand of a clock is 21 cm long. How much distance does its extremity move in 20 minutes?
8. Which of the six trigonometric functions are positive for $x = -\frac{10\pi}{3}$?
9. If $\tan \alpha = -2$, find the values of the remaining trigonometric functions of α .
10. If $\cos x + \sin x = \sqrt{2} \cos x$, show that $\cos x - \sin x = \sqrt{2} \sin x$.
11. Is the equation $2 \sin^2 x - \cos x + 4 = 0$ possible ?
12. For what real values of x is the equation $2 \cos \theta = x + \frac{1}{x}$ possible ?
13. Find the least value of $\cos^2 x + \sec^2 x$
14. Find the domain and the range of the function $f(x) = \frac{1}{\sqrt{4+3 \sin x}}$.
15. If $\sin x = 3/5$ and x lies in the second quadrant, find the value of $\cos x$.
16. If $\cos x = -2/3$ and x lies in the third quadrant, find the value of $\sin x$.
17. Draw the graphs of the following functions:
 - (i) $\sin 3x$
 - (ii) $3 \sin x$Also write their range and period.
18. Draw the graph of the following functions:
 - (i) $\cos 2$
 - (ii) $3 \cos 2x$
 - (iii) $2 \cos 3x$.Also write their range and period.
19. Which is greater : $\sin 40^\circ$ or $\cos 40^\circ$
20. Evaluate $\tan \frac{13}{12}$.

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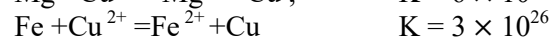
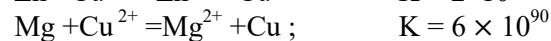
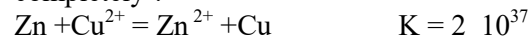
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CLASS 11 (CHEMISTRY) DPP (Academy) 07/09/2024

- In the reaction, $2X(g) + Y(g) \rightleftharpoons Z(g) + 80 \text{ cal}$, which of the following combination of pressure and temperature gives the highest yield of Z at equilibrium?
 - 400 atms and 100°C
 - 100 atms and 100°C
 - 400 atms and 500°C
 - 100 atms and 500°C
- For the gaseous reaction, $N_2 + 3H_2 \rightleftharpoons 2NH_3$, if one mole of H_2 reacts at equilibrium, how many moles of ammonia are formed?
 - $1/3$ mole
 - $3/2$ mole
 - $2/3$ mole
 - 2 moles
- For the reaction $I_2(g) \rightleftharpoons 2I(g)$, $K = 37.6 \times 10^{-6}$ at 1000 K. If 1.0 mole of I_2 is introduced into a 1.0 litre flask at 1000 K at equilibrium:
 - The concentration of $I_2(g)$ is much less than that of $I(g)$
 - The concentration of $I_2(g)$ is greater than that of $I(g)$
 - $[I_2] = I$
 - Not definite
- A liquid is in equilibrium with its vapour at its boiling point. On the average, the molecules in the two phases have equal:
 - intermolecular forces
 - potential energy
 - kinetic energy
 - none of the above
- A reaction reaches a state of equilibrium only when:
 - the reactants and products stop reacting
 - the concentration of reactants and products becomes equal
 - the products react together at the same rate at which they are formed
 - all the reactants and products are in the same phase
- An inert gas is added at constant pressure to the gaseous reaction $N_2 + 3H_2 \rightleftharpoons 2NH_3$ at equilibrium
 - The reaction halts
 - Forward reaction is favoured
 - The reaction remains unaffected
 - Backward reaction is favored
- HI is dissociated 20% at 448°C . Calculate the moles of H_2 , I_2 and HI at equilibrium. The moles of HI taken initially are 4:
$$2HI \rightleftharpoons H_2 + I_2$$

(a) 0.4, 0.4, 0.32	(b) 0.2, 0.2, 1.6
(c) 0.4, 0.4, 3.20	(d) None of these
- In the reaction $A+B \rightleftharpoons C + D$ at a given temperature the initial conc. of A was twice the initial conc. of B. When equilibrium was attained, the equilibrium conc. of C was three times the equilibrium conc. of B. The equilibrium constant K_c for the reaction is:
 - 1.8
 - 2.8
 - 2.0
 - 3.0
- When pressure is applied to the equilibrium system: $\text{Ice} \rightleftharpoons \text{Water}$, which of the following phenomenon will happen?
 - Equilibrium will not be disturbed
 - Water will evaporate
 - More ice will be formed
 - More water will be formed.
- In a chemical reaction equilibrium is said to have been established when the:
 - Conc. of reactants and products are equal
 - Opposing reactions do not take place
 - Velocities of opposing reactions become equal
 - Concentrations of products and reactants do not change with time
- A large increase in the rate of a reaction for a rise in temperature is due to:
 - increase in the number of collisions
 - increase in the number of activated molecules
 - lowering of activation energy
 - shortening of the mean free path.
- A mixture of three gases X (density 0.90), Y (density 0.178) and Z (density 0.42) is enclosed in a vessel at constant temperature. When the equilibrium is established, then:
 - gas X will be at the top of the vessel
 - gas Y will be at the top of the vessel
 - gas Z will be at the top of the vessel
 - gases will mix. homogeneously throughout the vessel
- When ethyl alcohol and acetic acid are mixed together in equimolar proportions, the equilibrium is attained. If at equilibrium two third of the acid is consumed, the equilibrium constant of the reaction will be:
 - 4
 - 6
 - 8
 - 12
- In which of the following gaseous reactions increase in volume of the container causes a shift to right?
 - $2CO + O_2 \rightleftharpoons 2CO_2$
 - $N_2 + 3H_2 \rightleftharpoons 2NH_3$
 - $PCl_5 \rightleftharpoons PCl_3 + Cl_2$



15. Which metal Zn, Mg or Fe removes Cu^{2+} ions from solution most completely ?



- (a) Zn (b) Mg (c) Fe (d) Equally
16. $\text{NO}_2 + \text{CO} \rightleftharpoons \text{NO} + \text{CO}_2$ One mole of NO_2 and 2 moles of CO are made to react. At equilibrium CO is found to be 75% of its original value. Value of K_c will be:
(a) $\frac{1}{4}$ (b) $\frac{1}{3}$ (c) $\frac{1}{2}$ (d) 1
17. 5 moles of SO_2 and 5 moles of O_2 are allowed to react. At equilibrium it was found that 60% SO_2 used up. If the pressure of the mixture is one atmosphere, the partial pressure of O_2 is:
(a) 0.52 atm (b) 0.21 atm
(c) 0.41 atm (d) 0.82 atm
18. If α is the fraction of HI dissociated at equilibrium in the reaction,
 $2\text{HI} \rightleftharpoons \text{H}_2 + \text{I}_2$ then starting with 2 mole of HI, the total number of moles of reactants and products at equilibrium are:
(a) 1 (b) 2 (c) $1 + \alpha$ (d) $2 + 2\alpha$
19. To an equilibrium mixture of, $2\text{SO}_2(\text{g}) + \text{O}_2(\text{g}) \rightleftharpoons 2\text{SO}_3(\text{g})$ some helium, an inert gas, is added at constant volume. The addition of helium causes the total pressure to double. Which of the following is true?
(a) The concentration of the three gases is unchanged
(b) The concentration of sulphur trioxide increases
(c) The number of moles of sulphur trioxide increases
(d) The concentration of sulphur dioxide increases
20. A vessel at 1000 K contains CO_2 with a pressure of 0.5 atm. Some of the CO_2 is converted into CO on the addition of graphite. If the total pressure at equilibrium is 0.8 atm, the value of K_p is:
(a) 0.18 atm (b) 1.8 atm (c) 3 atm (d) 0.3 atm

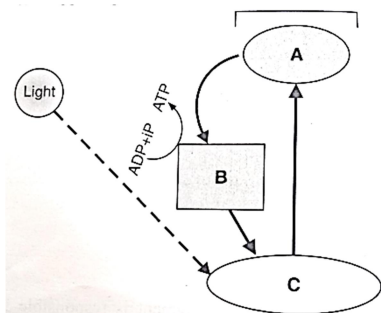
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why ?

20. Describe briefly the 'Emerson effect and its significance.

1. Cyanobacteria and some other photosynthetic bacteria don't have chloroplasts. How do they conduct photosynthesis
2. Does moonlight support photosynthesis ?
3. ATP enzyme consists of two parts .What are those parts ? How are they arranged in the thylakoid membrane ? conformational change occurs in which part of the enzyme ?
4. How are photosynthesis and respiration related to each other ?
5. In the diagram given below what is label A,B and C. What type of phosphorylation is possible in this ?



6. Why is RuBisCO enzyme the the most abundant enzyme in the word?
7. Why photorespiration does not take place in C₄ plants?
8. 5. In photosynthetic bacteria, H₂S is hydrogen donor instead of H₂O was indicated by whom?
9. The minimum number of chlorophyll molecules required in a photochemical act to release one molecule of O₂ is termed as.
10. Mitchell proposed which hypothesis for ATP production in photosynthesis?
11. 31. Name the enzyme that acts upon the substrate ribulose-1,5 biphosphate to produce 3-phosphoglyceric acid and 2-phosphoglycolic acid.
12. How much proportion of total photosynthesis is performed by aquatic plants?
13. What is pheophytin?
14. What do you understand by core complex?
15. Atmospheric CO₂ concentration is sub- optimal for photosynthesis and why
16. What is the basis for designating C₃ and C₄ plants pathways of photosynthesis ?
17. Chlorophyll af is the primary pigment for the light reaction. What are accessory pigments? What is their role in photosynthesis?
18. WHAT are hikll oxidants ?
19. Atmospheric CO₂ concentration is sub – optimal for photosynthesis and