ALL ODISHA EXAM SCIENCE GK PYQ

E- Book (PDF)

All Odisha Exam Previous Year Chapter Wise SCIENCE GK Question & Answer With EXPLANATION

[Exam- B.ED, TGT RHT, JT, CT, OSSTET, OAVS, OTET, OSSSC, OSSC, OPSC, Police SI /Constable, Battalion, Fireman, Jail Warder, (LI, FG, RI, ARI, JA, LSI, Group C)]

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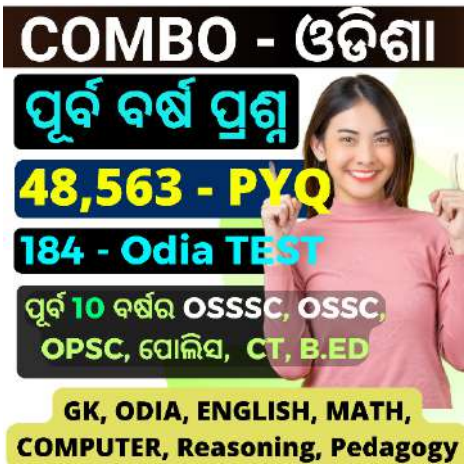

	Biology	No. Of PYQ
1	Cell Division	47
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3	Diseases	171
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All These Shifts Have Been Updated To The E-Book

Odisha Teaching Exams Previous Year Questions (PYQ)		
Sl. No.	**Exam Name**	**Year**
1	**CT**	2023 (All 11 Shifts), 2020 (All 20 Shifts), 2019 (All 24 Shifts), 2018 (All 23 Shifts)
2	**OTET (P-I,P-II)**	2024, 2022
3	**JT**	2023 (All 14 Shifts)
4	**B.ED Entrance Exam** (ARTS & SCIENCE)	2024, 2023, 2022, 2021 (All 15 Shifts), 2020 (All 13 Shifts), 2019 (All 15 Shifts), 2018 (All 11 Shifts)
6	**OSSTET** (ARTS, CBZ & PCM)	2024, 2022, 2021 (2^{nd}), 2021 (1^{st}), 2019, 2018
7	**SSB** (ARTS, CBZ & PCM)	2024
8	**RHT / High School Teacher**	
	➢ **RHT ARTS**	2023 Pre (All 3 Shifts) & Mains, 2022 (All 6 Shifts), 2021 (All 3 Shifts), 2019
	➢ **RHT CBZ**	2023 Pre (All 3 Shifts) & Mains, 2022 (All 3 Shifts), 2021, 2019
	➢ **RHT PCM**	2023 Pre (All 3 Shifts) & Mains, 2022 (All 4 Shifts), 2021 (All 2 Shifts), 2019 (All 2 Shifts)
9	**OAVS**	
	OAVS TGT ODIA	2021, 2019, 2018
	OAVS TGT ENGLISH	2019
	OAVS TGT SOCIAL STUDIES	2023, 2021, 2019
	OAVS TGT SCIENCE	2019, 2021
	OAVS TGT MATH	2023, 2019

OSSSC Previous Year Questions (PYQ)		
Sl. No.	Exam Name	Year
1	OSSSC LSI, FG, FORESTER	2024 (All 42 Shifts)
2	OSSSC RI	2021, 2015
3	OSSSC PEO & JA	2023
4	OSSSC CRE (ARI, AMIN, SFS, FG, EXCISE CONSTABLE)	2022
5	OSSSC JUNIOR CLERK	2018, 2017, 2015
6	OSSSC LSI	2021
7	OSSSC ICDS Supervisor	2016
8	OSSSC Excise Constable	2019, 2014
9	OSSSC VAW	2016
10	OSSSC Jr. Stenographer	2015
11	OSSSC Laboratory Technician	2021
12	OSSSC MPHW	2024, 2023
13	OSSSC Nursing	2023, 2020
14	OSSSC SFS	2016
15	OSSSC Pharmacist	2024, 2020
16	OSSSC Radiographer	2020

OSSC Previous Year Questions (PYQ)

Sl. No.	Exam Name	Year
1	OSSC ATO	2024
2	OSSC CHSL Specialist	2024
3	OSSC Assistant Sub-Inspector	2022
4	OSSC Accountant	2022
5	OSSC AMIN	2023
6	OSSC BSSO	2022 (All 18 Shifts)
7	OSSC CGL	2024, 2023, 2022 (All 18 Shifts)
8	OSSC CGL Specialist	2024, 2023
9	OSSC CHSL (Amin, Ayush, SCEW, JFTA)	2024, 2023
10	OSSC CPGL	2023
11	OSSC CTS	2024, 2023
12	OSSC ESI	2023
13	OSSC GPEO	2015
14	OSSC Investigator	2022 (All 3 Shifts)
15	OSSC WEO	2022
16	OSSC JEA	2022 (All 16 Shifts)
17	OSSC Junior Assistant	2022 (All 10 Shifts)
18	OSSC Junior Clerk	2022
19	OSSC SCEW	2022 (All 5 Shifts)

20	OSSC SFS	2016
21	OSSC Stenographer	2024, 2023
22	OSSC Supply Inspector	2017
23	OSSC WEO	2022 (All 21 Shifts)
24	OSSC Statistical Assistant	2024

Odisha Police & Defence Previous Year Questions (PYQ)		
Sl. No.	**Exam Name**	**Year**
1	Odisha Battalion / OSAP	2017
2	Odisha Police Constable	2023, 2018, 2013, 2012, 2011
3	Odisha Fireman	2023
4	Odisha Jail Warder	2022 (All 18 Shifts)
5	OPRB SI Police	2023, 2022 (All 11 Shifts), 2019, 2017, 2016
6	OSSC Excise SI	2024 (All 10 Shifts), 2022, 2021 (All 9 Shifts)
7	OSSC Traffic Constable	2024, 2022 (All 6 Shifts)
8	OSSC Traffic SI	2022 (All 4 Shifts)

OPSC Previous Year Questions (PYQ)		
Sl. No.	**Exam Name**	**Year**
1	OPSC Jr. Assistant	2024
2	OPSC ASO	2022, 2019, 2015, 2014
3	OPSC OMAS	2023, 2019
4	OPSC OAS	Only Odisha GK Taken From All Previous Year Preliminary Exams
5	OPSC Assistant Director Of Factory & Boiler	2023 Pre (Only Odisha GK)
	OPSC Assistant Director Handicraft	2024 (Math & Reasoning)
6	OPSC Asst Director Handicraft	2023 Pre (Only Odisha GK)

Odisha High Court Previous Year Questions (PYQ)		
Sl. No.	**Exam Name**	**Year**
1	OHC ASO	2023, 2023 (ST Special), 2021,

Odisha Forest Development Corporation Previous Year Questions (PYQ)		
Sl. No.	Exam Name	Year
1	OFDC Field Assistant	2021

Subject - Chemistry

Topic – Acid & Base

Q-1 What does 'NaCl' mean in chemistry?

ରସାୟନ ବିଜ୍ଞାନରେ 'ଏନ୍‌ଏସିଏଲ୍'ର ଅର୍ଥ କ'ଣ?

[OSSSC PEO & JA 2023]

(A) Common Salt

(B) Vitamin

(C} Sugar

(D) Acid

Ans- A

Explanation:

➔ **NaCl** is the chemical formula for **common salt**, also known as sodium chloride.

Other Options:

➔ **B. Vitamin**: NaCl is not a vitamin.

➔ **C. Sugar**: Sugar has the chemical formula $C_{12}H_{22}O_{11}$, not NaCl.

➔ **D. Acid**: NaCl is a salt, not an acid.

Q-2 On adding water to sodium the solution formed is

- ସୋଡିୟମରେ ପାଣି ମିଶାଇଲେ ଦ୍ରବଣ ସୃଷ୍ଟି ହୁଏ

[OSSSC Livestock Inspector 2021]

(A) neutral

B) alkaline

(C) acidic

D) amphoteric

Ans- B

Explanation:
➔ When **sodium** is added to water, the solution becomes **alkaline** due to the formation of **sodium hydroxide (NaOH)**, a strong base, and hydrogen gas.

Other Options:
➔ **A. Neutral**: The solution becomes alkaline, not neutral.
➔ **C. Acidic**: Sodium in water does not form an acidic solution.
➔ **D. Amphoteric**: The solution is not amphoteric; it is alkaline.

Q-3 Baking soda is a/an _____.

- ବେକିଂ ସୋଡା ହେଉଛି ____ ।

[OSSC WEO Exam 2022]

(A) Acid

(B) Indicator

(C) Base

(D) Detergent

Ans- C

Explanation:
➔ **Baking soda** is a **base** (also known as sodium bicarbonate). It neutralizes acids and has various applications, including cooking and cleaning.

Other Options:
➔ **A. Acid**: Baking soda is **not an acid**; it is basic in nature.
➔ **B. Indicator**: Baking soda does **not act as an indicator**.
➔ **D. Detergent**: Baking soda can clean, but it is **not classified as a detergent**.

Q-4 Which of the following products forms when heating Gypsum at 373 K?

- ଜିପ୍ସମ ଗରମ କରିବା ସମୟରେ ନିମ୍ନଲିଖିତ ମଧ୍ୟରୁ କେଉଁ ଉତ୍ପାଦ ସୃଷ୍ଟି ହୁଏ?

[OSSC SCEW 2022]

(A) Plaster of Paris

(B) Baking soda

(C) Washing Soda

(D) Milk of magnesia

Ans- A

Explanation:

➔ **Plaster of Paris** is formed when **gypsum is heated to 373 K**. This material is used in construction and medical casts.

Other Options:

➔ **B. Baking soda**: This is sodium bicarbonate, not produced by heating gypsum.

➔ **C. Washing soda**: This is sodium carbonate, not related to gypsum.

➔ **D. Milk of magnesia**: This is magnesium hydroxide, unrelated to gypsum.

Q-5 Which of the following is the weakest acid?

- ନିମ୍ନଲିଖିତ ମଧ୍ୟରୁ କେଉଁଟି ସବୁଠାରୁ ଦୁର୍ବଳ ଏସିଡ୍ ?

[Odisha jail Warder 2022]

A. HI

B. HBr

C. HF

D. HCl

Ans- C

Explanation:

➔ **HF (Hydrofluoric acid)** is the **weakest acid** among halogen acids because of its lower tendency to dissociate in water.

Other Options:

➔ **A. HI (Hydroiodic acid)**: This is a **strong acid** due to complete dissociation.
➔ **B. HBr (Hydrobromic acid)**: Also a **strong acid**.
➔ **D. HCl (Hydrochloric acid)**: **Widely used strong acid** in laboratories.

Q-6 Which acid is secreted during the ant and nettle sting?

[OSSC CGL Exam 2022]

(A) Methanoic acid

(B) Lactic acid

(C) Citric acid

(D) Acetic acid

Ans- A

Explanation:
➔ **Methanoic acid**, also known as **formic acid**, is secreted during **ant and nettle stings**, causing pain and irritation.

Other Options:
➔ **B. Lactic acid**: Found in sour milk, not in ant or nettle stings.
➔ **C. Citric acid**: Found in citrus fruits, not in stings.
➔ **D. Acetic acid**: Common in vinegar, not related to stings.

Q-7 Which of the following is a strong base?

ନିମ୍ନଲିଖିତ ମଧ୍ୟରୁ କେଉଁଟି ଏକ ଶକ୍ତିଶାଳୀ ଆଧାର?

[Odisha JT 2023]

1. Ammonium hydroxide (NH_4OH)

2. Sodium hydroxide (NaOH)

3. Calcium hydroxide ($(CaOH)_2$)

4. Magnesium hydroxide ($Mg(OH_2)$)

Ans- 2

Explanation:
➔ **Sodium hydroxide (NaOH)** is a **strong base**, meaning it fully dissociates into ions in water.

Other Options:
➔ **1. Ammonium hydroxide**: This is a weak base.
➔ **3. Calcium hydroxide**: This is a moderately strong base.
➔ **4. Magnesium hydroxide**: This is a weak base.

Q-8 Which of the following microbes listed below, has no role in acid production?

- ନିମ୍ନରେ ତାଲିକାଭୁକ୍ତ ନିମ୍ନଲିଖିତ ଜୀବାଣୁମଧ୍ୟରୁ କେଉଁଟିର ଏସିଡ୍ ଉତ୍ପାଦନରେ କୌଣସି ଭୂମିକା ନାହିଁ?

[Odisha CT Exam 2018]

A) Acetobacter aceti

B) Aspergillus niger

C) Saccharomyces cerevisiae

D) Clostridium butylicum

Ans- C

Explanation:
➔ **Saccharomyces cerevisiae**, commonly known as **baker's yeast**, plays a significant role in **fermentation**, but **it does not produce acid** like the other microbes listed.

Other Options:
➔ **A. Acetobacter aceti**: Produces **acetic acid**.
➔ **B. Aspergillus niger**: Used in the production of **citric acid**.
➔ **D. Clostridium butylicum**: Involved in the production of **butyric acid**.

Q-9 The acid rains are caused due to

- ଏସିଡ୍ ବର୍ଷା ____ ହେତୁ ହୋଇଥାଏ

[Odisha B.Ed Exam 2016]

(A) NO_2 and SO_2

(B) NH_3 and SO_3

(C) CO and CO_2

(D) O_3 and CO_2

Ans- A

Explanation:
➔ **Acid rains** are caused by the release of **NO_2 and SO_2** into the atmosphere, which form acidic compounds when mixed with water

vapor.

Other Options:

➔ **B. NH_3 and SO_3**: These compounds are not responsible for acid rain.

➔ **C. CO and CO_2**: These gases contribute to **global warming**, not acid rain.

➔ **D. O_3 and CO_2**: Ozone is not involved in acid rain formation.

Q-10 Identify the organic acid present in lemon that gives it sour taste.

- ଲେମ୍ବୁରେ ଥିବା ଜୈବିକ ଏସିଡ୍ କୁ ଚିହ୍ନଟ କରନ୍ତୁ ଯାହା ଏହାକୁ ଖଟା ସ୍ୱାଦ ଦେଇଥାଏ।

[Odisha High School Teacher Exam 2022]

A) Acetic acid

B) Citric acid

C) Tartaric acid

D) Oxalic acid

Ans- B

Explanation:

➔ **Lemon** contains **citric acid**, which gives it its sour taste and is commonly used in food and beverages.

Other Options:

➔ **A. Acetic acid**: Found in vinegar, not lemons.

➔ **C. Tartaric acid**: Found in tamarind, not lemons.

➔ **D. Oxalic acid**: Found in rhubarb and spinach, not lemons.

Q-11 Which of the following options gives the correct combination of indicator and its colour for acidic solution?

ନିମ୍ନଲିଖିତ ମଧ୍ୟରୁ କେଉଁ ବିକଳ୍ପ ଅମ୍ଳୀୟ ଦ୍ରବଣ ପାଇଁ ସୂଚକ ଏବଂ ଏହାର ରଙ୍ଗର ସଠିକ୍ ମିଶ୍ରଣ ଦିଏ?

[OAVS TGT Science 2019]

1. Methyl orange – red/orange
2. Litmus - blue
3. Turmeric - red
4. Bromophenol blue - blue

Ans- 1

Explanation:
➔ **Methyl orange** turns **red/orange** in acidic solutions and is a commonly used pH indicator.

Other Options:
➔ **2. Litmus - blue**: Litmus turns red in acidic solutions.
➔ **3. Turmeric - red**: Turmeric turns red in basic solutions, not acidic.
➔ **4. Bromophenol blue - blue**: This indicator turns yellow in acidic solutions.

Q-12 D-glucose reacts with hydroxyl amine to form

ଡି-ଗ୍ଲୁକୋଜ ହାଇଡ୍ରୋକ୍ସିଲ୍ ଆମିନ ସହିତ ପ୍ରତିକ୍ରିୟା କରି ସୃଷ୍ଟି ହୁଏ

[Odisha High School Teacher TGT CBZ 2019]

A) sorbitol and mannitol

B) glucose hydrazone

C) glucaric acid

D) glucose oxime

Ans- D

Explanation:
➔ When **D-glucose** reacts with hydroxylamine, it forms **glucose oxime** through the condensation of the carbonyl group with hydroxylamine.

Other Options:
➔ **A. Sorbitol and mannitol**: These are formed through reduction.
➔ **B. Glucose hydrazone**: Formed with hydrazine, not hydroxylamine.
➔ **C. Glucaric acid**: Formed through oxidation.

Q-13 Calculate the hydroxyl ion concentration of a caffeine base in an aqueous solution of concentration 0.00004M. The ionization constant Kb value was found to be 9 X 10^{-7} at 298K.

0.00004M ସାନ୍ଦ୍ରତାର ଜଳୀୟ ଦ୍ରବଣରେ ଏକ କ୍ୟାଫିନ୍ ବେସ୍ର ହାଇଡ୍ରୋକ୍ସିଲ୍ ଆୟନ ସାନ୍ଦ୍ରତା ଗଣନା କରନ୍ତୁ। ଆୟୋନିକରଣ ସ୍ଥିର କେବି ମୂଲ୍ୟ ୨୯୮କେରେ ୯ x ୧୦-୭ ଥିବା ଜଣାପଡିଥିଲା ।

[Odisha High School Teacher PCM 2021]

A) 6 x 10^{-6} moles/lit

B) 2.52 x 10^{-2} moles/lit

C) 36 x 10^{-12} moles/lit

D) 3 x 10^{-8} moles/lit

Ans- A

Given:
→ Concentration of caffeine base $[B] = 0.00004M$, Ionization constant $K_b = 9 \times 10^{-7}$.

Formula:
→ The hydroxyl ion concentration can be calculated using the formula: $[OH^-] = \sqrt{K_b \times [B]}$

Solution:
→ $[OH^-] = \sqrt{(9 \times 10^{-7}) \times (4 \times 10^{-5})} = \sqrt{36 \times 10^{-12}} = 6 \times 10^{-6}$ moles/liter.

Q-14 The Conjugate acid of NH_2^- is:

[OSSTET 2022]

(A) NH_3

(B) NH_2OH

(C) NH_4^-

(D) N_2H_4

Ans- A

Given:
→ The conjugate acid of NH_2^-.

Formula:
→ Conjugate acids are formed by adding a proton (H^+) to the base.

Solution:
→ The conjugate acid of NH_2^- is NH_3, as adding one proton forms ammonia.

Subject - Physics

Topic – Motion

Q-1 Which of the following is equal to force?

- ନିମ୍ନଲିଖିତ ମଧ୍ୟରୁ କେଉଁଟି ବଳ ସହ ସମାନ?

[OSSSC LSI, FG, FORESTER 2024]

(A) Mass * acceleration

(B) Mass * velocity

(C) Mass * distance

(D) Mass * time

ANS- A

Given: ➔ The relationship between force, mass, and acceleration.

Explanation: ➔ According to Newton's second law of motion, force is equal to the product of mass and acceleration.

Formula:

$F = m \times a$

Q-2 The higher the altitude, the more slowly windmills rotate at the same wind speed. Which of the following is the most appropriate reason why the blades of windmills rotate more slowly in regions of higher altitude at the same wind speed?

- ଉଚ୍ଚତା ଯେତେ ଅଧିକ ହେବ, ପବନର ବେଗ ସେତିକି ଧୀରେ ଧୀରେ ଘୂରିବୁଲୁଛି। ପବନର ବେଗ ସମାନ ବେଗରେ ଅଧିକ ଉଚ୍ଚତା ଥିବା ଅଞ୍ଚଳରେ ପବନକଳର ବ୍ଲେଡ୍ ଅଧିକ ଧୀରେ ଧୀରେ ଘୂରିବାର ସବୁଠାରୁ ଉପଯୁକ୍ତ କାରଣ ମଧ୍ୟରୁ କେଉଁଟି?

[OSSC Junior Assistant 2022 Exam]

A) The gravity increases as the altitude increases

B) The temperature increases as the altitude increases

C) It rains more often as the altitude increases

D) The air becomes less dense as altitude increases

Ans- D

Given:
➔ The blades of windmills rotate more slowly at higher altitudes even at the same wind speed.

Solution:
➔ At higher altitudes, the air becomes less dense. With less dense air, there is less resistance acting on the blades of the windmill, which results in slower rotation.

Q-3 A car is moving with high velocity when it takes a turn, a force acts on it outwardly because of

- ଏକ କାର୍ ଯେତେବେଳେ ମୋଡ଼ ନେଉଛି ସେତେବେଳେ ଏହା ଅଧିକ ବେଗରେ ଗତି କରୁଛି, ଏକ ବଳ ବାହ୍ୟ କାରଣରୁ ଏହା ଉପରେ କାର୍ଯ୍ୟ କରିଥାଏ

[Odisha Jail Warder 2022]

A. centrifugal force

B. centripetal force

C. gravitational force

D. All of these

Ans- B

Given:
➔ A car moving at high velocity takes a turn, and an outward force (centrifugal force) acts on it due to circular motion.

Solution:
➔ When an object moves in a circular path, centrifugal force pushes the object outward, while centripetal force keeps it moving along the circular path.

Q-4 A bus travels 18 Km in 60 minutes. The speed of the bus in m/s is?

ଗୋଟିଏ ବସ୍ ୬୦ ମିନିଟ୍ ରେ ୧୮ କିଲୋମିଟର ଯାତ୍ରା କରିଥାଏ। ବସ୍ ର ବେଗ କ'ଣ?

[Odisha CT Exam 2023]

a. 3

b. 90

c. 25

d. 5

Ans- D

Given:

➔ The bus travels 18 km in 60 minutes.

➔ We need to convert this to speed in meters per second.

Formula:

➔ Speed $v = \frac{\text{Distance}}{\text{Time}}$

➔ Distance $= 18\,\text{km} = 18{,}000\,\text{m}$

➔ Time $= 60\,\text{minutes} = 3{,}600\,\text{seconds}$

Solution:

$v = \frac{18{,}000}{3{,}600} = 5\,\text{m/s}$

Q-5 What is the acceleration due to gravity on the surface of the Earth approximately?

ପୃଥିବୀ ପୃଷ୍ଠରେ ମାଧ୍ୟାକର୍ଷଣ କାରଣରୁ ତ୍ୱରଣ ପ୍ରାୟ କ'ଣ?

[Odisha JT 2023]

1. 9.8 m/s^2

2. 7.3 m/s^2

3. 10 m/s^2

4. 6.2 m/s^2

Ans- 1

Given:

➔ We need to find the approximate acceleration due to gravity on the surface of the Earth.

Formula:

➔ The standard value of acceleration due to gravity on Earth's surface

is approximately:

$g = 9.8\,\text{m/s}^2$

Q-6 A train accelerates from 18 km/h to 72 km/h in 10 sec. What is the distance travelled by train?

ଏକ ଟ୍ରେନ୍ ୧୦ ସେକେଣ୍ଡରେ ୧୮ କିଲୋମିଟର/ଘଂଟାରୁ ୭୨ କିଲୋମିଟର/ଘଂଟା ବେଗରେ ଗତି କରେ । ଟ୍ରେନ୍ ରେ ଯାତ୍ରା କରୁଥିବା ଦୂରତା କେତେ?

[OSSTET 2022]

(A) 355 m

(B) 325 m

(C) 125 m

(D) 255 m

Ans- C

Given:

➔ A train accelerates from 18 km/h to 72 km/h in 10 seconds.

➔ We need to calculate the distance traveled by the train.

Formula:

➔ Use the following formulas for uniformly accelerated motion:

Initial velocity, $u = 18\,\text{km/h} = \dfrac{18 \times 1000}{3600}\,\text{m/s} = 5\,\text{m/s}$

Final velocity, $v = 72\,\text{km/h} = \dfrac{72 \times 1000}{3600}\,\text{m/s} = 20\,\text{m/s}$

Acceleration, $a = \dfrac{v - u}{t} = \dfrac{20 - 5}{10} = 1.5\,\text{m/s}^2$

➔ The distance traveled by the train is given by:

Distance, $s = ut + \frac{1}{2}at^2$

Solution:

➔ Substituting the known values:

$s = 5 \times 10 + \frac{1}{2} \times 1.5 \times 10^2$

$s = 50 + \frac{1}{2} \times 1.5 \times 100$

$s = 50 + 75 = 125\,\text{m}$

Q-7 The tension on the strings when the lift of mass 100 kg is accelerating upwards with an acceleration of 2 ms^{-2} is

ଯେତେବେଳେ 100 କିଲୋଗ୍ରାମ ର ବସ୍ତୁତ୍ୱ 2 ର ତ୍ୱରାନ୍ୱରଣ ସହିତ ଉପରକୁ ଗତି କରୁଛି ସେତେବେଳେ ଷ୍ଟ୍ରିଙ୍ଗରେ ଉତ୍ତେଜନା ହେଉଛି ms^{-2}

[Odisha High School Teacher PCM 2022]

A) 100 N

B) 780 N

C) 980 N

D) 1180 N

Ans- D

Given: ➔ Mass of the lift $m = 100\,\text{kg}$

➔ Acceleration of the lift $a = 2\,\text{m/s}^2$

➔ Gravitational acceleration $g = 9.8\,\text{m/s}^2$

Formula:

➔ The tension T in the string when the lift is accelerating upwards is given by:

$T = m(g + a)$

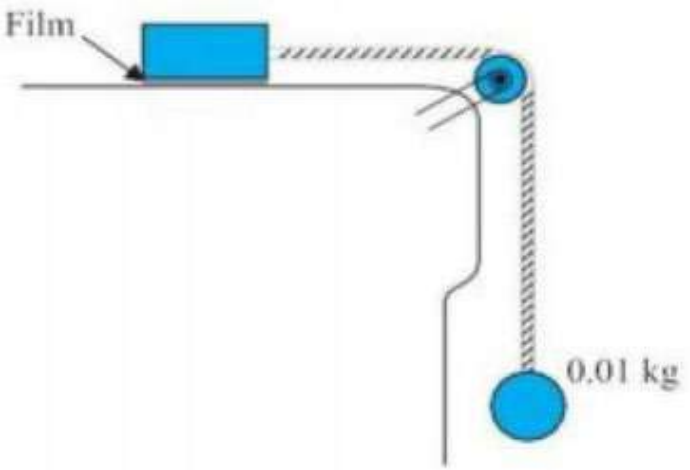
Solution:

➔ Substituting the values:

$T = 100 \times (9.8 + 2) = 100 \times 11.8 = 1180$ N

Q-8. A metal block of area 0.10 M^2 is connected to a 0.010 kg mass via a string that passes over an ideal pulley (considered massless and frictionless), as in Figure below. A liquid with a film thickness of 0.30 mm is placed between the block and the table. When released the block moves to the right with a constant speed of O. 085 m/s. Find the coefficient of viscosity of the liquid? (g = 9.8 m/S^2)

0.10 କ୍ଷେତ୍ରର ଏକ ଧାତୁ ବ୍ଲକଏକ 0.010 କିଲୋଗ୍ରାମ ବସ୍ତୁସହିତ ସଂଯୁକ୍ତ ହୁଏ ଯାହା ଏକ ଆଦର୍ଶ ପୁଲି (ବସ୍ତୁବିହୀନ ଏବଂ ଘର୍ଷଣହୀନ ଭାବରେ ବିବେଚନା କରାଯାଏ) ଉପରେ ଅତିକ୍ରମ କରେ, ଯେପରି କି ନିମ୍ନ ଚିତ୍ରରେ ଅଛି । ବ୍ଲକ ଏବଂ ଟେବୁଲ୍ ମଧ୍ୟରେ ୦.୩୦ ମିଲିମିଟର ର ଚଳଚ୍ଚିତ୍ର ମୋଟାପଣ ବିଶିଷ୍ଟ ଏକ ତରଳ ପଦାର୍ଥ ରଖାଯାଇଥାଏ। ମୁକ୍ତ ହେବା ପରେ ବ୍ଲକ ଓ. ୦୮୫ ମିଟର/ସେକେଣ୍ଡର ନିରନ୍ତର ବେଗରେ ଡାହାଣ ଦିଗକୁ ଗତି କରେ । ତରଳ ପଦାର୍ଥର ସାନ୍ଦ୍ରତାର ଗୁଣକ ସନ୍ଧାନ କରନ୍ତୁ? (g = 9.8 ମି/) M^2S^2



[OSSC RHT TGT PCM Mains 2023]

A. 4.86 X 10^{-3} Pa s

B. 1.8 6 x 10^{-3} Pa s

C. 1.5 X 10^{-3} Pa s

D. 3 .46 X 10^{-3} Pa s

Ans- D

Given: ➔ Area of the metal block, $A = 0.10\,\text{m}^2$
➔ Mass, $m = 0.010\,\text{kg}$
➔ Film thickness, $d = 0.30\,\text{mm} = 0.30 \times 10^{-3}\,\text{m}$
➔ Constant speed of the block, $v = 0.085\,\text{m/s}$
➔ Acceleration due to gravity, $g = 9.8\,\text{m/s}^2$

Formula: ➔ The force exerted by the hanging mass is $F = m \cdot g$.
➔ The force due to viscosity can be given by:

$$F_{\text{viscous}} = \eta \cdot A \cdot \frac{v}{d}$$

Where,

η is the coefficient of viscosity,
A is the area of the block,
v is the velocity,
d is the thickness of the liquid film.

Since the block moves with constant speed, the forces are balanced. Hence:

$$F_{\text{viscous}} = F_{\text{gravity}}$$

$$\eta \cdot A \cdot \frac{v}{d} = m \cdot g$$

Solution: ➔ Substituting the given values:

$$\eta \cdot (0.10) \cdot \frac{0.085}{0.30 \times 10^{-3}} = 0.010 \cdot 9.8$$

$$\eta \cdot 0.10 \cdot \frac{0.085}{0.0003} = 0.098$$

$$\eta \cdot 0.10 \cdot 283.33 = 0.098$$

$$\eta \cdot 28.333 = 0.098$$

$$\eta = \frac{0.098}{28.333}$$

$$\eta \approx 3.46 \times 10^{-3} \text{ Pa s}$$

Subject - Biology

Topic – Human Physiology

Q-1 Hemoglobin shows maximum affinity with which of the following?

ହିମୋଗ୍ଲୋବିନ୍ ନିମ୍ନଲିଖିତ ମଧ୍ୟରୁ କେଉଁଟି ସହିତ ସର୍ବାଧିକ ସମ୍ପର୍କ ଦେଖାଏ?

[OSSSC Livestock Inspector 2021]

(A) CO

(B) CO_2

(C) O_2

(D)NH_3

Ans- A

Explanation:
Hemoglobin shows the highest affinity for **carbon monoxide (CO)**, which binds to it more strongly than oxygen, reducing oxygen transport in the blood.

Other Options:
➔ **B) CO_2:** Incorrect, **carbon dioxide** does not bind as strongly to hemoglobin as **CO**.
➔ **C) O_2:** Incorrect, although **hemoglobin** carries oxygen, its affinity is much higher for **CO**.
➔ **D) NH3:** Incorrect, **ammonia** does not bind to hemoglobin.

Q-2 Which of the following statements is not true of liver?

ନିମ୍ନଲିଖିତ ମଧ୍ୟରୁ କେଉଁ ବିବୃତି ଯକୃତ ବିଷୟରେ ସତ୍ୟ ନୁହେଁ?

[OSSSC Junior Clerk 2015]

A) It is black in colour.

B) It weighs about 40 to 60 ounces.

C) It is the largest gland in the body.

D) It helps in digesting food.

Ans- A

Explanation:
The **liver** is not **black in color**; it is reddish-brown. It is also the **largest gland** in the body, weighing about **40 to 60 ounces**, and plays a vital role in **digestion**.

Other Options:
➔ **B) It weighs about 40 to 60 ounces:** Correct, the liver weighs approximately **40 to 60 ounces**.
➔ **C) It is the largest gland in the body:** Correct, the liver is the **largest gland**.
➔ **D) It helps in digesting food:** Correct, the liver produces **bile**, aiding in **digestion**.

Q-3 What is the name of the enzyme that is secreted by the pancreas, that helps in digestion of proteins?

ଅଗ୍ନାଶୟ ଦ୍ୱାରା ସ୍ରାବ ହେଉଥିବା ଏନଜାଇମର ନାମ କ'ଣ, ଯାହା ପ୍ରୋଟିନ୍ ହଜମ କରିବାରେ ସାହାଯ୍ୟ କରିଥାଏ?

[OSSSC LSI, FG, FORESTER 2024]

(A) Lipase
(B) Amylase
(C) Trypsin
(D) Pepsin

ANS- (C)

Explanation:
➔ The pancreas secretes **trypsin**, an enzyme that aids in the **digestion of proteins** by breaking them down into smaller peptides.
➔ **Trypsin** is essential for the proper digestion of dietary proteins.

Other Options:
➔ **A. Lipase:** Incorrect, **lipase** breaks down fats, not proteins.
➔ **B. Amylase:** Incorrect, **amylase** breaks down starches, not proteins.
➔ **D. Pepsin:** Incorrect, **pepsin** is produced in the stomach, not the pancreas.

Q-4 What is the condition of the refractive defect of vision in which a human being can see nearby objects clearly but cannot see the distant objects distinctly?

ଦୃଷ୍ଟିର ପ୍ରତିକ୍ରିୟାଶୀଳ ତ୍ରୁଟିର ଅବସ୍ଥା କ'ଣ ଯେଉଁଥିରେ ମନୁଷ୍ୟ ନିକଟସ୍ଥ ବସ୍ତୁଗୁଡ଼ିକୁ ସ୍ପଷ୍ଟ ଭାବରେ ଦେଖିପାରେ କିନ୍ତୁ ଦୂରବସ୍ତୁଗୁଡ଼ିକୁ ସ୍ପଷ୍ଟ ଭାବରେ ଦେଖିପାରେ ନାହିଁ?

[OSSC CGL Exam 2022]

(A) Presbyopia

(B) Myopia

(C) Astigmatism

(D) Hypermetropia

Ans- B

Explanation:
Myopia is a condition where a person can see **nearby objects** clearly but has difficulty seeing **distant objects** due to the light being focused **in front of** the retina.

Other Options:
➔ **A) Presbyopia:** Incorrect, **presbyopia** is an age-related condition where the eye loses the ability to focus on close objects.
➔ **C) Astigmatism:** Incorrect, **astigmatism** is caused by an irregular curvature of the eye's lens.
➔ **D) Hypermetropia:** Incorrect, **hypermetropia** is the inability to see **near objects** clearly.

Q-5 Which hormone is mainly involved in milk ejection?

କ୍ଷୀର ନିଷ୍କାସନରେ ମୁଖ୍ୟତଃ କେଉଁ ହରମୋନ୍ ସମ୍ପୃକ୍ତ?

[OSSC SCEW 2022]

(A) Oxytocin

(B) Vasopressin

(C) Thyroxine

(D) Melatonin

Ans- A

Explanation:
The hormone **Oxytocin** is mainly involved in **milk ejection** during breastfeeding. It stimulates the contraction of the **milk ducts** in the breasts.

Other Options:
➔ **B) Vasopressin:** Incorrect, **vasopressin** is involved in water retention and **blood pressure regulation**.
➔ **C) Thyroxine:** Incorrect, **thyroxine** regulates **metabolism**.
➔ **D) Melatonin:** Incorrect, **melatonin** regulates the **sleep-wake cycle**.

Q-6 Where does the majority of fat digestion of food occur in the human body?

ମନୁଷ୍ୟ ଶରୀରରେ ଅଧିକାଂଶ ଚର୍ବି ହଜମ କେଉଁଠି ହୋଇଥାଏ?

[OSSC Junior Assistant 2022 Exam]

A) Small Intestine

B) Oesophagus

C) Mouth

D) Spleen

Ans- A

Explanation:
The majority of **fat digestion** occurs in the **small intestine**, where bile from the liver and enzymes from the pancreas break down fats.

Other Options:

➔ **B) Oesophagus:** Incorrect, the **oesophagus** is involved in food transport, not digestion.

➔ **C) Mouth:** Incorrect, minimal digestion of fats occurs in the **mouth**.

➔ **D) Spleen:** Incorrect, the **spleen** is not involved in digestion.

Q-7 Which of the following glands produces insulin?

ନିମ୍ନଲିଖିତ ଗ୍ରନ୍ଥିମଧ୍ୟରୁ କେଉଁଟି ଇନସୁଲିନ୍ ଉତ୍ପାଦନ କରେ?

[OSSC WEO Exam 2022]

(A) Thyroid

(B) Adrenal gland

(C) Pancreas

(D) Liver

Ans- C

Explanation:

The **pancreas** produces **insulin**, a hormone that regulates glucose metabolism.

Other Options:

➔ **A) Thyroid:** Incorrect, the **thyroid** produces **thyroxine**.

➔ **B) Adrenal gland:** Incorrect, the **adrenal glands** produce **cortisol** and **adrenaline**.

➔ **D) Liver:** Incorrect, the **liver** does not produce insulin.

Q-8 A component, which helps in digestion, transportation and excretion, is

ଏକ ଉପାଦାନ, ଯାହା ହଜମ, ପରିବହନ ଏବଂ ନିଷ୍କାସନରେ ସାହାଯ୍ୟ କରେ, ତାହା ହେଉଛି

[Odisha Jail Warder 2022]

A. vitamins

B. minerals

C. roughage

D. water

Ans- D

Explanation:
Water is essential for digestion, transportation of nutrients, and excretion in the human body.

Other Options:
➔ **A) Vitamins:** Incorrect, vitamins are organic compounds necessary for various metabolic functions but not directly involved in these processes.
➔ **B) Minerals:** Incorrect, minerals support body functions but do not specifically aid in digestion and excretion.
➔ **C) Roughage:** Incorrect, roughage or fiber aids in digestion but is not a fluid component.

Q-9 If mother's blood group is B and father's is AB, which of the following cannot be their child's blood group?

ଯଦି ମା'ଙ୍କ ରକ୍ତ ଗ୍ରୁପ୍ ବି ଏବଂ ପିତାଙ୍କ ଏବି, ତେବେ ନିମ୍ନଲିଖିତ ମଧ୍ୟରୁ କେଉଁଟି ସେମାନଙ୍କ ପିଲାଙ୍କ ରକ୍ତ ଗୋଷ୍ଠୀ ହୋଇପାରିବ ନାହିଁ?

[OPRB POLICE SI 2023]

A) A

B) B

C) AB

D) O

Ans- D

Explanation:
If the mother's blood group is **B** and the father's is **AB**, the possible blood groups of their child could be **A**, **B**, or **AB**. **O** is not possible.

Other Options:
➔ **A) A:** Correct, possible blood group.
➔ **B) B:** Correct, possible blood group.
➔ **C) AB:** Correct, possible blood group.
➔ **D) O:** Incorrect, **O** is not a possible blood group.

Q-10 Which of the following phytohormones is also known as 'stress hormone'?

ନିମ୍ନଲିଖିତ ମଧ୍ୟରୁ କେଉଁ ଫାଇଟୋହରମୋନକୁ 'ଷ୍ଟ୍ରସ୍ ହର୍ମୋନ୍' ମଧ୍ୟ କୁହାଯାଏ?

[Odisha High School Teacher CBZ 2019]

A) Abscisic acid

B) Gibberellic acid

C) Cytokinin

D) Ethylene

Ans- A

Explanation:
Abscisic acid is also known as the **'stress hormone'**, as it helps plants respond to **stress conditions** such as drought.

Other Options:
➔ **B. Gibberellic acid:** Incorrect, **gibberellic acid** promotes **growth** and **development**.
➔ **C. Cytokinin:** Incorrect, **cytokinins** promote **cell division**.
➔ **D. Ethylene:** Incorrect, **ethylene** is a **ripening hormone**.

Q-11 Who was the first person to describe blood circulation in the body?

ଶରୀରରେ ରକ୍ତ ସଞ୍ଚାଳନ ବିଷୟରେ ବର୍ଣ୍ଣନା କରିଥିବା ପ୍ରଥମ ବ୍ୟକ୍ତି କିଏ ଥିଲେ?

[Odisha High School Teacher CBZ 2021]

A) Louis Pasteur

B) Gregor Mendel

C) Edward Jenner

D) William Harvey

Ans- D

Explanation:
William Harvey was the first person to describe **blood circulation** in the body, particularly the role of the **heart** in pumping blood.

Other Options:
➔ **A) Louis Pasteur:** Incorrect, **Pasteur** is known for his work on **germ theory**.

➔ **B) Gregor Mendel:** Incorrect, **Mendel** is known for his work on **genetics**.
➔ **C) Edward Jenner:** Incorrect, **Jenner** is known for developing the **smallpox vaccine**.

Q-12 The nerve centre for hunger and thirst is present in

ଭୋକ ଓ ତୃଷ୍ଣା ପାଇଁ ସ୍ନାୟୁ କେନ୍ଦ୍ର____ ରହିଛି

[OSSC RHT CBZ Mains 2023]

A. Pons

B. Medulla

C. Hypothalamus

D. Thalamus

Ans- C

Explanation:
The **hypothalamus** is the nerve center for **hunger** and **thirst** regulation, controlling various essential functions in the body.

Other Options:
➔ **A) Pons:** Incorrect, the **pons** is involved in **respiration** and **sleep** regulation.
➔ **B) Medulla:** Incorrect, the **medulla** regulates **involuntary functions** like **heart rate**.
➔ **D) Thalamus:** Incorrect, the **thalamus** is a **relay station** for sensory information.

Q-13 An inhibitory neurotransmitter in the central nervous system is:

କେନ୍ଦ୍ରୀୟ ସ୍ନାୟୁପ୍ରଣାଳୀରେ ଏକ ନିରୋଧକ ନ୍ୟୁରୋଟ୍ରାନ୍ସମିଟର ହେଉଛି:

[SSB TGT CBZ 2024]

(A) Epinephrine
(B) Nor-epinephrine
(C) GABA
(D) Glutamate

ANS- C

Explanation:
➔ **GABA** (**Gamma-Aminobutyric Acid**) is an **inhibitory neurotransmitter** in the central nervous system, reducing neuronal excitability.

Other Options:
➔ **A. Epinephrine:** Incorrect, **epinephrine** is an excitatory neurotransmitter and hormone.
➔ **B. Nor-epinephrine:** Incorrect, **nor-epinephrine** also acts as an excitatory neurotransmitter.
➔ **D. Glutamate:** Incorrect, **glutamate** is an excitatory neurotransmitter.

Q-14 Arrange the following First Aid sequence in a correct manner.

ନିମ୍ନଲିଖିତ ପ୍ରାଥମିକ ଚିକିତ୍ସା କ୍ରମକୁ ସଠିକ୍ ଉପାୟରେ ବ୍ୟବସ୍ଥା କରନ୍ତୁ।

[OTET P-1 2022]

1. Restore Breathing

2. Stop severe Bleeding

3. Treat Shock

4. Call advanced medical help immediately

(A) 2,4,3, 1

(B) 1,2,3,4

(C) 4,3,2, 1

(D) 4,2, 1,3

Ans- D

Explanation:
The correct sequence for **first aid** is: **Call advanced medical help immediately**, **Stop severe bleeding**, **Restore breathing**, **Treat shock**.

Q-15 A man has taken a large amount of protein in his diet. He will excrete more of:

ଜଣେ ବ୍ୟକ୍ତି ନିଜ ଖାଦ୍ୟରେ ବିପୁଳ ପରିମାଣର ପ୍ରୋଟିନ୍ ଗ୍ରହଣ କରିଥାନ୍ତି। ସେ ଅଧିକ ନିଷ୍କାସନ କରିବେ:

[OSSTET 2018]

(A) Urea

(B) Uric acid

(C) Sugar

(D) Salts and sugar

Ans- A

Explanation:
➔ After consuming a large amount of **protein**, more **urea** is excreted as

it is a waste product of protein metabolism.

Other Options:

➔ **B. Uric acid:** Incorrect, **uric acid** is a waste product of **purine metabolism** rather than protein metabolism.

➔ **C. Sugar:** Incorrect, **sugar** levels are unaffected by protein intake.

➔ **D. Salts and sugar:** Incorrect, **protein intake** does not increase the excretion of **salts and sugar**.

Q-16 The arteries which supply blood to the muscles of the heart are called :

ହୃତ୍ ପିଣ୍ଡର ମାଂସପେଶୀକୁ ରକ୍ତ ଯୋଗାଉଥିବା ଧମନୀଗୁଡ଼ିକୁ କୁହାଯାଏ :

[OSSTET 2021 1st]

(A) Coronary

(B) Hepatic

(C) Pulmonary

(D) Renal

Ans- A

Explanation:

➔ The **coronary arteries** supply blood to the muscles of the **heart** itself, providing oxygen and nutrients.

Other Options:

➔ **B. Hepatic:** Incorrect, **hepatic arteries** supply blood to the **liver**.

➔ **C. Pulmonary:** Incorrect, **pulmonary arteries** carry blood from the heart to the lungs.

➔ **D. Renal:** Incorrect, **renal arteries** supply blood to the kidneys.

Q-17 What is the location of 'crypts of Lieberkuhn'?

'ଲିବରକୁହନର କ୍ରିପ୍ଟ'ର ଅବସ୍ଥିତି କ'ଣ?

[OSSTET 2024]

(A) Small intestine

(B) Liver

(C) Pancreas

(D) Pyloric gland

Ans- A

Explanation:

➔ The **crypts of Lieberkuhn** are located in the **small intestine** and are responsible for the secretion of digestive enzymes and the renewal of intestinal cells.

➔ These crypts play an essential role in digestion and the absorption of nutrients.

Other Options:

➔ **B. Liver:** Incorrect, the **liver** produces bile but does not have **crypts of Lieberkuhn**.

➔ **C. Pancreas:** Incorrect, the **pancreas** produces digestive enzymes but does not contain these crypts.

➔ **D. Pyloric gland:** Incorrect, the **pyloric glands** are found in the stomach, not the intestine.

Q-18 Which of the following cranial nerves is present in the human eye ?

ମନୁଷ୍ୟ ଆଖିରେ ନିମ୍ନଲିଖିତ ମଧ୍ୟରୁ କେଉଁ କ୍ରେନିଆଲ ସ୍ନାୟୁ ଉପସ୍ଥିତ ଅଛି ?

[OAVS TGT Science 2018]

1. I
2. X
3. VII
4. II

Ans- 1

Explanation:
The **optic nerve** (cranial nerve **II**) is responsible for **vision** and is found in the **human eye**.

Other Options:
➔ **2. X:** Incorrect, cranial nerve **X** is the **vagus nerve**.
➔ **3. VII:** Incorrect, cranial nerve **VII** is the **facial nerve**.
➔ **4. II:** Correct, cranial nerve **II** is the **optic nerve**.

Q-19 Corpus luteum, a ruptured follicle formed during the mid-menstrual cycle, secretes which of the following hormones?

କର୍ପସ ଲୁଟିୟମ୍, ମଧ୍ୟ-ଋତୁସ୍ରାବ ସମୟରେ ସୃଷ୍ଟି ହୋଇଥିବା ଏକ ଫାଟିଯାଇଥିବା ଫଲିକଲ୍, ନିମ୍ନଲିଖିତ କେଉଁ ହରମୋନ୍ ସ୍ରାବ କରେ?

[OAVS TGT Science 2021]

1. Progesterone
2. Luteinizing hormone
3. Oestrogen
4. FSH - Follicle stimulating hormone

Ans- 1

Explanation:

➔ The **corpus luteum** secretes **progesterone**, which helps maintain the **uterine lining** during pregnancy.

Other Options:

➔ **2. Luteinizing hormone:** Incorrect, **LH** triggers ovulation and the formation of the corpus luteum but is not secreted by it.

➔ **3. Oestrogen:** Incorrect, **estrogen** is produced primarily by the follicles before ovulation.

➔ **4. FSH:** Incorrect, **FSH** stimulates the growth of ovarian follicles but is not secreted by the corpus luteum.