

NEW STANDARD ACADEMY

SEMRI KOTHI SUPER MARKET, RAEBARELI

CLASS 10 (BIOLOGY) DPP (Academy) 12/08/2024

1. What is meant by heredity?
2. Which is the universally accepted law of inheritance?
3. Name the plant chosen by Mendel for his experiment.
4. Name the three laws or principal of inheritance given by Mendel?
5. Explain the following terms:
 - (i) Gene
 - (ii) Phenotype
6. State Mendel's law of dominance
7. Why is the law of segregation known as the law of purity of gametes?
8. What was the main aim of Mendel's experiments?
9. Explain how clone is produced.
10. Define the term genotype
11. Define the term phenotype
12. What is meant by F, generation?
13. What is meant by Punnett square?
14. What is meant by emasculation?
15. What is the phenotypic Mendelian ratio of a monohybrid cross and dihybrid cross
16. What is a monohybrid cross?
17. What is a dihybrid cross?
18. What are mutagens? Name the types.
19. How are traits classified? Explain them.
20. Write a short note on accumulation of variations.
21. What is a dominant trait?
22. State Mendel's three laws of inheritance

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CLASS 10 (CHEMISTRY) DPP (Academy) 12/08/2024

- Identify the acid and base which form sodium hydrogen carbonate. Write chemical equation in support of your answer. State whether this compound is acidic, basic or neutral. Also write its pH value.
- During electrolysis of brine, a gas 'G' is liberated at anode. When this gas 'G' is passed through slaked lime, a compound 'C' is formed, which is used for disinfecting drinking water.
 - Write formula of 'G' and 'C'
 - What is common name of compound "C"? Give its chemical name.
 - State the chemical equation involved.
- A chemical compound 'X' is used in the soap and glass industry. It is prepared from brine.
 - Write the chemical name, common name and chemical formula of X
 - Write the equation involved in its preparation.
 - What happens when it is treated with water containing Ca or Mg salts?"
- A chemical compound X is used in glass, soap and paper industries. On treatment with ethanoic acid, it forms salt, Water and carbon dioxide.
 - Identify X.
 - State the number of molecules of water of crystallization present in compound X
 - How is the compound obtained from brine? Write the equations involved
- A white powder is used by doctors to support fractured bones.
 - Write the name and chemical formula of the compound.
 - How is this powder prepared
 - When this white powder is mixed with water, a hard solid mass is obtained. Write a balanced chemical equation for the change
 - Give one more use of this white powder.
- A compound X which is prepared from gypsum has the property of hardening when mixed with proper quantity of water.
 - State the difference in chemical composition between baking soda and baking powder.
- A student took a small amount of copper oxide in a conical flask and added dilute hydrochloric acid to it with constant stirring. He observed a change in colour of the solution.
 - write the name of the compound formed and its colour.
 - Write a balanced chemical equation for the reaction involved.
- The pH of a salt used to make tasty and crispy pakoras is 14 Identify the salt and write a chemical equation for its formation. List its two uses.
- Sometimes the pH of our mouth gets lower than 5.5. Why?
 - A basic salt X is obtained by heating baking soda followed by crystallisation. Identify X and state its two industrial uses.
 - Why do copper sulphate crystals turn white on heating?
- A metal M on reacting with dilute acid liberates a gas G The same metal also liberates gas G when reacts with a base.
 - Write the name of gas G.
 - How will you test the presence of this gas?
 - Write chemical equation for the reactions of the metal with (a) an acid and (b) a base.
- Consider the following salts:
 - YCl
 - NH₄ X
 - ZCO₃
 - If Y is sodium, what will be the pH of salt solution?
 - If X is nitrate, then solution of NH₄ X will give which colour with universal indicator?
 - What would be the change in colour in blue litmus, if ZCO₃ is added to it and Z is potassium.
- How is a universal indicator better than litmus solution?
 - State two features of pH scale.
 - Why should we not add water to a concentrated acid ?
- On heating X at 373 K, it loses water molecules and becomes Y. Y is a substance which doctors use for supporting fractured bones in the right position.
 - Identify X and Y.
 - How can X be reobtained from Y.
- A bud of petunia becomes reddish purple in rain. What does it indicate?
- What is litmus solution? What is its colour in natural form?
- Which has more H⁺ ion concentration, 1M HCl or 1M CH₃COOH?

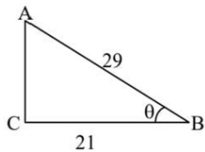
17. Which has more OH^- ion concentration 1 M NaOH or 1 M NH_4OH ?
18. Enamel of teeth contains which chemical?
19. . Which of the solutions-tomato juice, distilled water, lemon juice and NaOH solution could have the pH 2, 4,7 and 14?
20. How is chloride of lime chemically different from calcium chloride? Why does chloride of lime gradually lose its chlorine when kept exposed to air?

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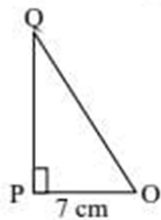
CLASS 10 (MATH'S) DPP (Academy) 12/08/2024

- If ABC is right angle triangle, $\angle B = 90^\circ$, $AB = 12$ cm, $AC = 13$ cm then find $\sin A$ and $\cos C$.
- If $\sin A = \frac{1}{\sqrt{2}}$ in right triangle ABC, then find value of $\tan A$, $\operatorname{cosec} A$, $\tan B$, $\operatorname{cosec} B$.
- If $\angle B$ and $\angle Q$ are acute angles such that $\sin B = \sin Q$, then prove that $\angle B = \angle Q$.
- Consider $\triangle ACB$, right-angled at C, in which $AB = 29$ units, $BC = 21$ units and $\angle ABC = \theta$ (see figure). Determine the value of
 - $\cos 2\theta + \sin 2\theta$,



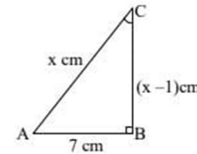
(ii) $\cos 2\theta - \sin 2\theta$

- In $\triangle OPQ$, right-angled at P, $OP = 7$ cm and $OQ - PQ = 1$ cm (see figure). Determine the values of $\sin Q$ and $\cos Q$.



- Given $15 \cot A = 8$, find $\sin A$ and $\sec A$.
- Given $\sec \theta = \frac{13}{12}$, calculate all other trigonometric ratios.
- If $\angle A$ and $\angle B$ are acute angles such that $\cos A = \cos B$, then show that $\angle A = \angle B$

- In $\triangle ABC$, right –angled at B, $AB = 7$ cm and $(AC - BC) = 1$ cm. Find the values of $\sin C$ and $\cos C$.



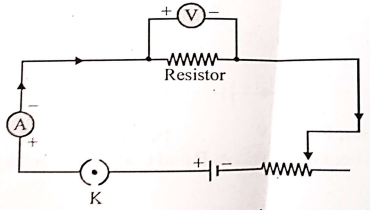
- If $\cot \theta = \frac{7}{8}$, evaluate:
 - $\frac{(1+\sin \theta)(1-\sin \theta)}{(1+\cos \theta)(1-\cos \theta)}$
 - $\cot^2 \theta$
- If $3 \cot A = 4$, check whether $\frac{1-\tan^2 A}{1+\tan^2 A} = \cos^2 A - \sin^2 A$ or not
- In triangle ABC, right-angled at B, if $\tan A = \frac{1}{\sqrt{3}}$, find the value of :
 - $\sin A \cos C + \cos A \sin C$
 - $\cos A \cos C - \sin A \sin C$
- In $\triangle PQR$, right-angled at Q, $PR + QR = 25$ cm and $PQ = 5$ cm. Determine the values of $\sin P$, $\cos P$ and $\tan P$.
- If $\sin A = \frac{3}{5}$, find $\cos A$ and $\tan A$.
- If $\operatorname{cosec} A = \sqrt{10}$, find other five trigonometric ratios.
- If $\tan A = \sqrt{2} - 1$, show that $\sin A \cos A = \frac{\sqrt{2}}{4}$
- In a $\triangle ABC$ right angled at C, if $\tan A = \frac{1}{\sqrt{3}}$ and $\tan B = \sqrt{3}$. Show that $\sin A \cos B + \cos A \sin B = 1$.
- If $\sec \alpha = \frac{5}{4}$, evaluate $\frac{1-\tan \alpha}{1+\tan \alpha}$.
- If $\cot B = \frac{12}{5}$, prove that $\tan^2 B - \sin^2 B = \sin^4 B \cdot \sec^2 B$.
- In a right triangle ABC, right angled at B, the ratio of AB to AC is $1 : \sqrt{2}$. Find the values of $\frac{2 \tan A}{1+\tan^2 A}$.

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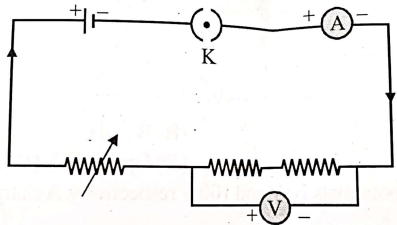
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CLASS 10 (PHYSICS) DPP (Academy) 12/08/2024

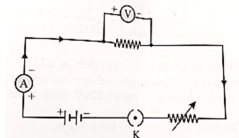
1. Which two circuit components are connected in parallel in the following circuit diagram?



- (A) Rheostat and voltmeter
 (B) Voltmeter and resistor
 (C) Voltmeter and ammeter
 (D) Ammeter and resistor
2. To determine the equivalent resistance of two resistors when connected in series, a student arranged the components as shown in the diagram. But he did not succeed to achieve the objective. Which of the following mistakes has been committed by him in setting up the circuit?

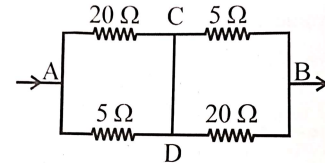


- (A) Position of ammeter is incorrect.
 (B) Position of voltmeter is incorrect.
 (C) Terminals of ammeter are wrongly connected.
 (D) Terminals of voltmeter are wrongly connected.
3. The following circuit diagram shows the experimental set-up for the study of dependence of current on potential difference. Which two circuit components are connected in series?



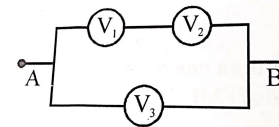
- (A) Battery and Voltmeter
 (B) Ammeter and Voltmeter
 (C) Ammeter and Rheostat
 (D) Resistor and Voltmeter

4. When some potential difference is maintained between A and B, current / enters the network at A and leaves at B



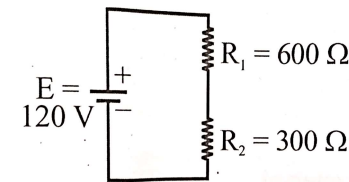
- (A) The equivalent resistance between A and B is 8Ω .
 (B) C and D are at the same potential.
 (C) No current flows between C and D
 (D) Current $(3/5)$ flows D to C.

5. Three voltmeters, all having different resistances, are joined as shown in the figure. When some potential difference is applied across A and B, their readings are V_1, V_2, V_3 :



- (A) $V_1 = V_2$ (B) $V_1 \neq V_2$ (C) $V_1 + V_2 = V$ (D) $V_1 + V_2 > V$

6. In the circuit, the battery is ideal. A voltmeter of resistance 600Ω is connected in turn across R_1 and R_2 , giving readings V_1 and V_2 respectively:



- (A) $V_1 = 80V$ (B) $V_1 = 60V$ (C) $V_2 = 30V$ (D) $V_2 = 40V$

Comprehension-1

A battery of EMF $10 V$ having internal resistance of 22Ω is connected to an external resistance of 32 . The battery is first in charging mode and then in discharging mode.

7. The current flowing through the external resistance is :
 (A) $1A$ (B) $3A$ (C) $2A$ (D) $10A$
8. The terminal potential difference during discharging mode of battery:

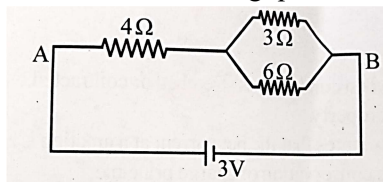
- (A) 6V (B) 2V (C) 1V (D) 10V

9. The terminal potential difference during the charging mode of battery:

- (A) 5V (B) 10V (C) 14V (D) 9V

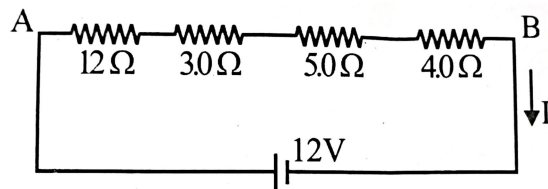
Comprehension-2

Answer the following question based on the given circuit

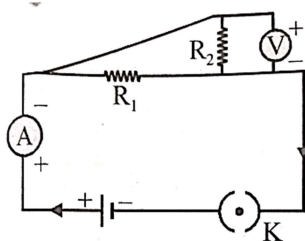


10. The potential drop across the 3 Ω resistor is:
 (A) 1 V (B) 1.5 V (C) 2 V (D) 3V
11. The equivalent resistance between points A and B is:
 (A) 7Ω (B) 6 Ω (C) 13 Ω (D) 5 Ω
12. The current flowing through in the given circuit is:
 (A) 0.5A (B) 1.5A (C) 6A (D) 3A

Comprehension-3

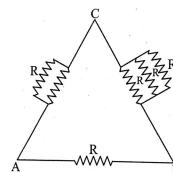


13. The equivalent resistance between points A and B is:
 (A) 12 Ω (B) 36 Ω (C) 32 Ω (D) 24 Ω
14. The current through each resistor is:
 (A) 1A (B) 2.3A (C) 0.5A (D) 0.75A
15. The potential drop across the 12 Ω resistor is:
 (A) 12V (B) 6V (C) 8V (D) 0.5V
16. Which of the circuit components in the following circuit diagram and connected in parallel?

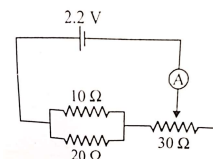


- (A) R₁ and R₂ only (B) R₁, R₂ and V
 (C) R₂ and V only (D) R₁ and V only

17. Six identical resistors connected between points A, B and C as shown in diagram. The equivalent resistance would be maximum between.



- (A) A and B (B) B and C
 (C) A and C (D) Option (A), (B) and (C) are correct
18. points A and B are at electric potentials 10 V and 100 V respectively. A charge q is taken from A to B and 18 joule of work is done. The value of q is:
 (A) 2 coulomb (B) 0.2 coulomb
 (C) 20 coulomb (D) 0.02 coulomb
19. The resistance of rheostat shown in the figure is 0 – 30 Ω. Neglecting the resistance of ammeter and connecting wire the minimum and maximum currents through the ammeter will be:



- (A) (0.08 A, 0.33 A) (B) (0.06 A, 0.08 A)
 (C) (0.06 A, 0.33 A) (D) (0.33 A, 0.09 A)
20. A 10 V battery is connected to a series combination of two resistance of 4000 Ω and 6000 Ω. A non-ideal voltmeter of resistance 10000 connected across 4000 Ω reads 3.226 V. What would be the value if the same voltmeter connected across 6000 Ω?
 (A) 3.326V (B) 4.326V (C) 3.238 V (D) 4.828V

