



CHEMISTRY

BOOKS - HT Olympiad Previous Year Paper

NSO QUESTION PAPER 2016 SET B

Science

1. Fill in the blanks by choosing an appropriate option.

W is a very reactive metal, reacts vigorously with oxygen and water therefore, stored in (1).

X is a non-metal, soft and dull and forms (2) oxides with oxygen.

Y is very reactive (3), catches fire if exposed to air therefore, stored in water.

Z does not react with dilute hydrochloric acid even on heating but it reacts with sulphuric acid. When it is exposed to moist air for long, it acquires a dull (4) coating.

A. W-Na, 1-Water, X-S, 2-Basic, Y-P, 3-Metal, Z-Cu, 4-Reddish brown

B. W-Mg, 1-Kerosene, X-P, 2-Acidic, Y-Si, 3-Metal, Z-Ag, 4-Reddish brown

C. W-Na, 1-Kerosene, X-S, 2-Acidic, Y-P, 3-Non-metal, Z-Cu, 4-Green

D. W-Al, 1-Water, X-Zn, 2-Amphoteric, Y-P, 3-Non-metal, Z-Cu, 4-Green

Answer: C



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2. Compounds formed by four different elements P, Q, R and S are PQ_3 , P_2 , S_3 , RS_2 , and RQ_4 .

The possible electronic configurations of elements P, Q, R and S are

	<i>P</i>	<i>Q</i>	<i>R</i>	<i>S</i>
A.	2, 8, 2	2, 8	2, 1	2, 8, 3
B.	2, 8, 3	2, 8	2, 1	2, 8, 2
C.	2, 8	2, 8, 2	2, 8, 3	2, 1
D.	2, 8, 3	2, 8, 7	2, 8, 4	2, 6



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3. Read the given statements and select the correct option.

Statement 1 : During fractional distillation of petroleum, the temperature increases inside the fractionating column on going from bottom to the top.

Statement 2 : The fraction with the lower boiling point condenses first.

A. Both statements 1 and 2 are true and statement 2 is the correct explanation of statement 1.

B. Both statements 1 and 2 are true but statement 2 is not the correct explanation of statement 1.

C. Statement 1 is true but statement 2 is false.

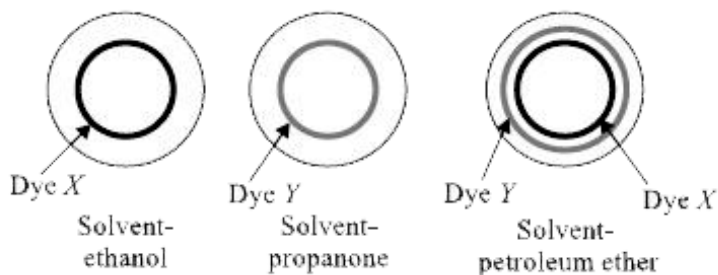
D. Both statements 1 and 2 are false.

Answer: D



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4. A group of class 9 students was given a paint fragment containing two dyes X and Y. Three different types of chromatograms were obtained using three different solvents as shown in the figure :



Which of the following statements is correct?

A. Y is soluble in ethanol but X is not.

B. X is soluble in ethanol as well as in petroleum ether.

C. Y is insoluble in propanone as well as in petroleum ether.

D. All of these

Answer: A,C



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5. Cotton is used to make clothes as

A. It is strong, heavy and absorbs water

B. It has low tensile strength, absorbs dyes
and is transparent

C. It is light, soft, absorbs dyes and sweat

D. It is good conductor of heat.

Answer: C



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6. The composition of five particles P, Q, R, S and T is given in the table :

Substance	No. of protons	No. of neutrons	No. of electrons
<i>P</i>	25	30	25
<i>Q</i>	13	13	13
<i>R</i>	13	14	10
<i>S</i>	9	10	9
<i>T</i>	9	10	10

Identify atoms, ions and isotopes.

	Atoms	Ions	Isotopes
A.	<i>P, Q, S</i>	<i>R, T</i>	<i>S and T</i>
B.	<i>R, T</i>	<i>P, Q, S</i>	<i>Q and R</i>
C.	<i>P, Q, S</i>	<i>R, T</i>	<i>Q and R</i>
D.	<i>Q, R</i>	<i>P, T</i>	<i>S and T</i>



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7. Match the columns I, II and III and select the correct option using the given codes.

	Column I	Column II	Column III
(a)	4.25 g of NH_3	(i) 2 moles	(p) 5.6 L at STP
(b)	4 g of H_2	(ii) 0.25 mol	(q) $6.022 \times 10^{23} \times 0.75$ atoms
(c)	10 moles of H_2SO_4	(iii) 6.022×10^{23} atoms	(r) 14 g
(d)	12 g of oxygen gas	(iv) 0.375 mole	(s) 12.046×10^{23} molecules
(e)	1 mole of nitrogen atom	(v) 980 g	(t) $7 \times 10 \times 6.022 \times 10^{23}$ atoms

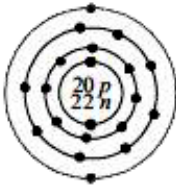
(Given : Atomic mass of N = 14 u, H = 1 u, S = 32 u, O = 16 u)

- | | a | b | c | d | e |
|----|------------|------------|-----------|------------|------------|
| A. | (iii), (q) | (i), (p) | (iv), (r) | (ii), (s) | (v), (t) |
| B. | (ii), (t) | (iii), (p) | (iv), (s) | (i), (q) | (v), (r) |
| C. | (i), (p) | (ii), (q) | (v), (r) | (iii), (s) | (iv), (t) |
| D. | (ii), (p) | (i), (s) | (v), (t) | (iv), (q) | (iii), (r) |

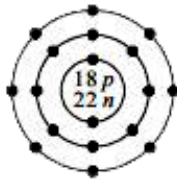


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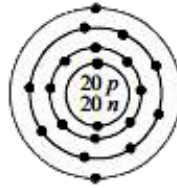
8. Which of the following are isobars?



I



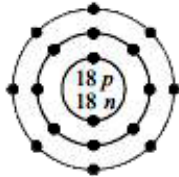
II



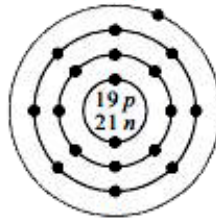
III



IV



V



VI

A. I and II only

B. II, III and VI only

C. II and VI only

D. II, III, IV and V only

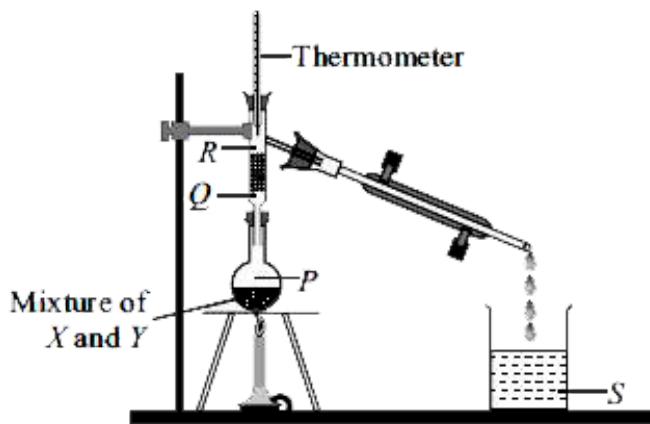
Answer: B



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Achievers Section

1. A mixture of two liquids X and Y was placed in a flask as shown in the given figure. The mixture was heated using a Bunsen burner. The boiling point of X is 230 K and that of Y is 250 K.



Which of the following statements is correct?

- A. The purpose of fractionating column is to decrease the surface area for cooling.
- B. As the vapour travel up from Q to R, the vapour of X condense more readily.
- C. When the thermometer first shows a constant reading, point P will be richer

in proportion of X vapours.

D. The liquid 'Y' distills over first and is collected in beaker S.

Answer: C



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