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**WINTER BREAK HOMEWORK-PHYSICS(XI)**

1. A truck starts from rest and accelerates uniformly at  $2\text{m/s}^2$ . At  $t=10\text{s}$ , a stone is dropped by a person standing on the top of the truck (6m high from the ground). What are the (a) Velocity (b) acceleration of the stone at  $t=11\text{s}$ ? (Neglect air resistance.)
2. Railway carriage of mass 9000 kg moving with a speed of 36Km/h collides with the stationary carriage of the same mass. After the collision, the two get coupled and move together. What is the common speed and what type of collision is this?
3. Coconut is broken into pieces by throwing it with a velocity of 2m/s from a height of 5m. What is the kinetic energy when it is at a height of 3m? What is its speed at ground level?
4. Find the center of mass of a system of three particles at the vertices of an equilateral triangle. The masses of the particles are 100g, 150g and 200g respectively. Each side of the equilateral triangle is 0.5m long.
5. To what height a mass can go, when sent up with a velocity half of the escape velocity?
6. State Newton's law of gravitation. Find the percentage decrease in the weight of the body when taken to a height of 16 km above the surface of the earth. Radius of the earth is 6400 km.
7. A pump on the ground floor of a building can pump up water to fill a tank of volume  $30\text{m}^3$  in 15 min. If the tank is 40m above the ground, and the efficiency of the pump is 30%, how much electric power is consumed by the pump?
8. A hammer of 1 kg moving with a speed of 6m/s strikes a wall and comes to rest in 0.1s. Calculate i) the impulse of force ii) The retardation of the hammer, and iii) The retarding force that stops the hammer.
9. A Cricket ball of mass 150g is moving with a velocity of 12m/s and is hit by a bat so that the ball is turned back with a velocity of 20m/s. The force of the blow acts for 0.01s on the ball. Find the average force exerted by the bat on the ball.
10. Class work should be completed

**CLASS XI – BIOLOGY /**

1. What is cell theory? Who modified the hypothesis of Schleiden & Schwann?
2. Name a membraneless cell organelle, largest isolated animal cell, longest animal cell.
3. What are the main components of a Prokaryotic cell? Where do you find plasmids? Give 1 function of plasmid.
4. In a typical prokaryotic cell, explain the structure and function of each of the following:  
(i) Plasma membrane      (iv) flagellum  
(ii) Capsule                      (v) pili and fimbriae  
(iii) mesosomes
5. Why do we call cell membrane to be dynamic, fluid and semi permeable?
6. "Fluid-mosaic model of cell membrane" was given by Singer-Nicolson. Explain the structure with help of labelled diagram.
7. Why does golgi apparatus remain in close association with E.R.?
8. Name the various types of vacuoles found in cells. Also mention the function of each.
9. With the help of diagram, explain the structure of Mitochondria.
10. Classify the types of Plastids found in plant cell. Name the pigments present in chloroplasts.
11. What do you understand by 'Cartwheel' like structure? Draw a well labelled diagram also.
12. Give a brief account of nucleosome and nuclear pore.
13. Why does the nucleus have an envelope around it? What are the principal roles of nucleus?
14. Name the primary constriction present in every chromosome.
15. Identify various types of chromosomes based on the position of centromere.

1 आपके विद्यालय में पीने के पानी की व्यवस्था अच्छी नहीं है। पानी की टंकियाँ गंदी पड़ी हैं और टोटियाँ टूटी पड़ी हैं। विद्यालय में पानी की व्यवस्था ठीक करने के लिए प्राचार्य को प्रार्थना पत्र लिखिए।

2 भारतीय स्टेट बैंक ऑफ इंडिया प्रधान कार्यालय-नारीमन प्वाइंट, मुंबई को कम्प्यूटर आपरेटर्स की आवश्यकता है। अपनी योग्यताओं का विवरण देते हुए आवेदन-पत्र प्रस्तुत कीजिए।

3 पठित पाठों के प्रश्नोत्तर को लिखकर याद कीजिए।

4 कोई दो अपठित काव्यांश को पढ़कर पांच प्रश्नों का निर्माण कीजिए।

5 कोई दो पठित गद्यांश को पढ़कर पांच प्रश्नों का निर्माण कीजिए।

## CHEMISTRY

1.	The number of atoms present in one mole of an element is equal to Avogadro number. Which of the following element contains the greatest number of atoms?
(a)	4g H
(b)	46g Na
(c)	0.40g Ca
(d)	12g He
2.	If the concentration of glucose ( $C_6H_{12}O_6$ ) in blood is $0.9 \text{ g L}^{-1}$ , what will be the molarity of glucose in blood?
(a)	5 M
(b)	50 M
(c)	0.005 M
(d)	0.5 M
3.	Which of the following statements about a compound is <b>incorrect</b> ?
(a)	A molecule of a compound has atoms of different elements.
(b)	A compound cannot be separated into its constituent elements by physical methods of separation
(c)	A compound retains the physical properties of its constituent elements.
(d)	The ratio of mass of atoms of different elements in a compound is fixed
4.	Which of the following is responsible to rule out the existence of definite paths or trajectories of electrons?

(a)	Pauli's exclusion principle.
(b)	Heisenberg's uncertainty principle.
(c)	Hund's rule of maximum multiplicity.
(d)	Aufbau principle

5.	Number of angular nodes for $4d_{xy}$ orbital is _____.
(a)	4
(b)	3
(c)	2
(d)	1
6.	Out of the following pairs of electrons, identify the pairs of electrons present in degenerate orbitals:
(a)	(i) $n = 3, l = 2, m = -2, s = -1/2$ (ii) $n = 3, l = 1, m = -1, s = -1/2$
(b)	(i) $n = 3, l = 1, m = 1, s = +1/2$ (ii) $n = 3, l = 2, m = 1, s = +1/2$
(c)	(i) $n = 4, l = 1, m = 1, s = +1/2$ (ii) $n = 3, l = 2, m = 1, s = +1/2$
(d)	(i) $n = 3, l = 2, m = +2, s = -1/2$ (ii) $n = 3, l = 2, m = +2, s = +1/2$
7.	Consider the isoelectronic species, $\text{Na}^+$ , $\text{Mg}^{2+}$ , $\text{F}^-$ and $\text{O}^{2-}$ . The correct order of increasing length of their radii is _____.
(a)	$\text{F}^- < \text{O}^{2-} < \text{Mg}^{2+} < \text{Na}^+$
(b)	$\text{Mg}^{2+} < \text{Na}^+ < \text{F}^- < \text{O}^{2-}$
(c)	$\text{O}^{2-} < \text{F}^- < \text{Na}^+ < \text{Mg}^{2+}$
(d)	$\text{O}^{2-} < \text{F}^- < \text{Mg}^{2+} < \text{Na}^+$
8.	The types of hybrid orbitals of nitrogen in $\text{NO}_2^+$ , $\text{NO}_3^-$ and $\text{NH}_4^+$ respectively are expected to be
(a)	$sp, sp^3$ and $sp^2$
(b)	$sp, sp^2$ and $sp^3$
(c)	$sp^2, sp$ and $sp^3$
(d)	$sp^2, sp^3$ and $sp$

9.		Number of $\pi$ bonds and $\sigma$ bonds in the following structure is-
(a)	6, 19	

	(b)	4, 20
	(c)	5, 19
	(d)	5, 20
10.		$\Delta_f U^\circ$ of formation of $\text{CH}_4$ (g) at certain temperature is $-393 \text{ kJ mol}^{-1}$ . The value of $\Delta_f H^\circ$ is-
	(a)	zero
	(b)	$< \Delta_f U^\circ$
	(c)	$> \Delta_f U^\circ$
	(d)	equal to $\Delta_f U^\circ$
11.		Which of the following is <b>not</b> a general characteristic of equilibria involving physical processes?
	(a)	Equilibrium is possible only in a closed system at a given temperature.
	(b)	All measurable properties of the system remain constant.
	(c)	The opposing processes occur at the same rate and there is dynamic but stable condition.
	(d)	The volume of the system increases.
12.		In which of the following reactions, the equilibrium remains unaffected on addition of small amount of argon at constant volume?
	(a)	$\text{H}_2$ (g) + $\text{I}_2$ (g) $\rightleftharpoons$ 2HI (g)
	(b)	$\text{PCl}_5$ (g) $\rightleftharpoons$ $\text{PCl}_3$ (g) + $\text{Cl}_2$ (g)
	(c)	$\text{N}_2$ (g) + 3 $\text{H}_2$ (g) $\rightleftharpoons$ 2 $\text{NH}_3$ (g)
	(d)	The equilibrium will remain unaffected in all the three cases.


	<p><b>Q. No. 13 to 16 are of Assertion- Reason type.</b></p> <p>Select the most appropriate answer from the options given below:</p> <p>(a) Both A and R are true and R is the correct explanation of A</p> <p>(b) Both A and R are true but R is not the correct explanation of A.</p> <p>(c) A is true but R is false.</p> <p>(d) A is false but R is true.</p>
13.	<p>Assertion: One atomic mass unit is defined as one twelfth of the mass of one carbon-12 atom.</p>
	<p>Reason: Carbon-12 isotope is the most abundant isotope of carbon and has been chosen as standard.</p>
14.	<p>Assertion: Boron has a larger first ionisation enthalpy than beryllium.</p> <p>Reason: The penetration of a 2s electron to the nucleus is more than the 2p electron hence 2p electron is more shielded by the inner core of electrons than the 2s electrons.</p>
15.	<p>Assertion: Though the central atom of both <math>\text{NH}_3</math> and <math>\text{H}_2\text{O}</math> molecules are <math>\text{sp}^3</math> hybridised, yet H-N-H bond angle is greater than that of H-O-H.</p> <p>Reason: This is because nitrogen atom has one lone pair and oxygen atom has two lone pairs.</p>

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16.	<p>Assertion: Spontaneous process is an irreversible process and may be reversed by some external agency.</p> <p>Reason: Increase in enthalpy is a contributory factor for spontaneity.</p>
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17.		If two elements can combine to form more than one compound, the masses of one element that combine with a fixed mass of the other element, are in whole number ratio.
	(i)	Is this statement true? If yes, according to which law?
	(ii)	Give one example related to this law.
18.		Determine the empirical formula of an oxide of iron, which has 69.9% iron and 30.1% dioxygen by mass.  OR Calculate the mass per cent of different elements present in sodium sulphate ( $\text{Na}_2\text{SO}_4$ ).
19.	(i)	For the reaction, $2 \text{Cl}(\text{g}) \rightarrow \text{Cl}_2(\text{g})$ , what are the signs of $\Delta H$ and $\Delta S$ ?
	(ii)	A reaction, $A + B \rightarrow C + D$ , $\Delta_r H^\circ = +ve$ , is found to have a positive entropy change. At what condition of temperature, the reaction will be spontaneous?
20.		Derive equation for pressure-volume work. Also derive the equation of work for isothermal reversible expansion.
21.		Write the expression for the equilibrium constant, $K_c$ for each of the following reactions:
	(i)	$2\text{NOCl}(\text{g}) \rightleftharpoons 2\text{NO}(\text{g}) + \text{Cl}_2(\text{g})$
	(ii)	$2\text{Cu}(\text{NO}_3)_2(\text{s}) \rightleftharpoons 2\text{CuO}(\text{s}) + 4\text{NO}_2(\text{g}) + \text{O}_2(\text{g})$
		<b>SECTION C</b>
		<b>This section contains 2 questions with internal choice in one question. The following questions are short answer type and carry 3 marks each.</b>
22.		50.0 kg of $\text{N}_2(\text{g})$ and 10.0 kg of $\text{H}_2(\text{g})$ are mixed to produce $\text{NH}_3(\text{g})$ . Calculate the amount of $\text{NH}_3(\text{g})$ formed. Identify the limiting reagent in the production of $\text{NH}_3$ in this situation.
23.	(i)	Write two limitations of Rutherford atomic model.
	(ii)	Which quantum numbers tell us about Shape and Size of orbital respectively?
	(iii)	State Heisenberg's uncertainty principle with mathematical expression.

24.	(i)	What is the lowest value of n that allows g orbitals to exist?
	(ii)	How many subshells are associated with n = 4?
	(iii)	If an electron of hydrogen gives yellow line in linear spectrum. In which spectral series this line belongs to?
25.		Give reasons: -

	(i)	All five bonds in $\text{PCl}_5$ are not equal.
	(ii)	The boiling point of ortho- nitro phenol is less than para-nitro phenol.
	(iii)	The dipole moment of $\text{CO}_2$ is zero while of $\text{SO}_2$ it is not zero, why?
26.	(i)	$\text{MgSO}_4$ is easily soluble in water but $\text{BaSO}_4$ not, explain.
	(ii)	Find formal charge of Oxygen marked 1 and 3 in ozone. 
	(iii)	Although hybridisation of Oxygen in $\text{H}_2\text{O}$ and $\text{OF}_2$ is $sp^3$ yet the bond angle in $\text{H}_2\text{O}$ is $104^\circ$ while in $\text{OF}_2$ it is $102^\circ$ , explain.
27.		The combustion of one mole of benzene takes place at 298 K. After combustion, $\text{CO}_2$ (g) and $\text{H}_2\text{O}$ (l) are produced and 3267.0 KJ of heat is liberated. Calculate the standard enthalpy of formation of benzene. Standard enthalpies of formation of $\text{CO}_2$ (g) and $\text{H}_2\text{O}$ (l) are -393.5 and -285.83 KJ $\text{Mol}^{-1}$ respectively.
28.		At 473 K, equilibrium constant $K_c$ for decomposition of phosphorus pentachloride ( $\text{PCl}_5$ ) is $8.3 \times 10^{-3}$ . If decomposition is depicted as, $\text{PCl}_5$ (g) $\rightleftharpoons$ $\text{PCl}_3$ (g) + $\text{Cl}_2$ (g) $\Delta_r H^\circ = + 124.0 \text{ kJ mol}^{-1}$
	(i)	What is the value of $K_c$ for the reverse reaction at the same temperature?
	(ii)	What would be the effect on $K_c$ if (a) pressure is increased (b) the temperature is increased?

31.	(i)	Define Hund's Rule of Maximum Multiplicity.
	(ii)	Explain the physical significance of $\Psi^2$ .
	(iii)	Table-tennis ball has a mass of 10 g and a speed of 90 m/s. If speed can be measured within an accuracy of 4% what will be the uncertainty in speed and position?
OR		
	(i)	Define Pauli Exclusion Principle.
	(ii)	Write the electronic configurations of the following ions: (a) $S^{2-}$ (b) $Fe^{+2}$
	(iii)	Dual behavior of matter proposed by de Broglie led to the discovery of electron microscope often used for the highly magnified images of biological molecules and other type of material. If the velocity of the electron in this microscope is $1.6 \times 10^6 \text{ ms}^{-1}$ , calculate de Broglie wavelength associated with this electron.
32.	(i)	Compare the magnetic behavior of the following species: $O_2^{+2}$ and $N_2^-$ according to MOT. (No need to draw MO energy level diagram)
	(ii)	Predict the hybridisation of each carbon in the molecule of organic compound given below.  $CH \equiv C - \overset{\overset{O}{\parallel}}{C} - CH_2 - \overset{\overset{O}{\parallel}}{C} - OH$
	(iii)	Find shape of these molecules. (a) $XeOF_4$ (b) $BrF_3$
OR		
	(i)	Draw the molecular orbital energy level diagram to show that $N_2$ would be expected to have a triple bond.
	(ii)	Arrange the following bonds in order of increasing ionic character giving reason. $N-H$ , $F-H$ , $C-H$ and $O-H$
	(iii)	Draw the resonating structure of Ozone molecule.

33.	(i)	Define enthalpy change with mathematical expression.
	(ii)	Calculate the amount of heat in kJ necessary to raise the temperature of 60.0 g of aluminium from $35^\circ\text{C}$ to $55^\circ\text{C}$ . Molar heat capacity of $Al$ is $24 \text{ J mol}^{-1} \text{ K}^{-1}$ .
	(iii)	Calculate the difference in energy at constant pressure and volume for combustion of 1 mole of benzene at $25^\circ\text{C}$ . $C_6H_6(l) + 15/2 O_2(g) \rightarrow 6CO_2(g) + 3H_2O(l)$

OR		
	(i)	Define molar heat capacity with mathematical expression.
	(ii)	What is adiabatic process?
	(iii)	For the reaction $2 A(g) + B(g) \rightarrow 2D(g)$ $\Delta U^\circ = -10.5 \text{ kJ}$ and $\Delta S^\circ = -44.1 \text{ JK}^{-1}$ . Calculate $\Delta G^\circ$ for the reaction, and predict whether the reaction may occur spontaneously.
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## HOLIDAY HOMEWORK FOR ENGLISH CLASS XI -120 TO 150 WORDS

1. Write a letter to the editor of a newspaper expressing your concern about the increasing pollution levels in your city.
2. Write an essay on the importance of education in a person's life.
3. Write a diary entry about your first day at college.
4. The significance of preserving wildlife
5. Write an article on the effects of social media on teenagers.
6. MAKE A POSTER ON THE TOPIC – 'SAY NO TO DRUGS'

## HOLIDAY HOMEWORK FOR CS

1. Which of the following commands will create a list?
  - a) list1 = list()
  - b) list1 = []
  - c) list1 = list([1, 2, 3])
  - d) all of the mentioned
2. What is the output when we execute list("hello")?
  - a) ['h', 'e', 'l', 'l', 'o']
  - b) ['hello']
  - c) ['llo']
  - d) ['olleh']
3. Suppose listExample is ['h','e','l','l','o'], what is len(listExample)?
  - a) 5
  - b) 4
  - c) None
  - d) Erro
4. Suppose list1 is [3, 5, 25, 1, 3], what is min(list1)?
  - a) 3
  - b) 5
  - c) 25
  - d) 1
5. Which of the following statements create a dictionary?
  - a) d = {}
  - b) d = {"john":40, "peter":45}
  - c) d = {40:"john", 45:"peter"}
  - d) All of the mentioned

6. What will be the output of the following Python code snippet?

```
1. d = {"john":40, "peter":45}
```

- a) "john", 40, 45, and "peter"
- b) "john" and "peter"
- c) 40 and 45
- d) d = (40:"john", 45:"peter")

7. What will be the output of the following Python code snippet?

```
1. d1 = {"john":40, "peter":45}
2. d2 = {"john":466, "peter":45}
3. d1 == d2
```

- a) True
- b) False
- c) None
- d) Error

8. Suppose  $d = \{\text{"john":40, "peter":45}\}$ . To obtain the number of entries in dictionary which command do we use?

- a) `d.size()`
- b) `len(d)`
- c) `size(d)`
- d) `d.len()`

9. If `a` is a dictionary with some key-value pairs, what does `a.popitem()` do?

- a) Removes an arbitrary element
- b) Removes all the key-value pairs
- c) Removes the key-value pair for the key given as an argument
- d) Invalid method for dictionary

## MATHS

- ① Complete home work of 3-Dim Geom, Conic sections.
- ② Solve all examples of both chapters.
- ③ Solve all questions of study material of 3 Dim geom, Conic sections.
- ④ Solve 2 sample papers from provided study material.
- ⑤ prepare all chapters for session ending exam.

