**DASHAIN HOME ASSIGNMENT-2076**

**Class: XI Subject: Chemistry**

**Note:**

1. **The students who have passed in all subjects in First Unit Test are required to attempt the questions from Group A only.**
2. **The students who have not passed in the all subjects in First Unit Test must do all the questions from both the groups.**
3. **All the absent students must attempt all the questions.**

**Group: A**

1. State Charle's Law.
2. Explain why climbers carry oxygen Cylinder during mountaineering?
3. What is Universal Gas constant? Give its S.I unit?
4. Why gases do not settle at the bottom of container?
5. 350ml of gas at 27°C was cooled to 5°C without charge in pressure. Calculate the contraction in volume.
6. 400 ml of oxygen was collected at 25°C and 632 mm of Hg pressure. Calculate its volume at NTP.
7. The density of a gas is 1.76gm/l at 750 mm of Hg pressure and 30°C. What is the molecular mass of the gas?
8. What do you mean by absolute zero and absolute scale of temperature?
9. State Dalton's law of partial pressure.
10. Plot a graph of a) P Vs V b) D Vs P c) PV Vs V d) PV Vs P
11. Differentiate between isotopes and isobars.
12. Name the isotopes of hydrogen which

a) is radioactive b) contains no neutron c) is also called heavy hydrogen

1. What are subatomic particles? Justify their naming.
2. What is fractional atomic mass?
3. Write down the limitations of Rutherford atomic model.
4. Why did Rutherford use gold during α-scattering experiment?
5. Explain why an electron never falls inside the nucleus.
6. What do you mean by quantization of angular momentum?
7. Give the main drawbacks of Bohr's atomic model.
8. Create a table of different spectral series showing their regions, higher orbit as well as lower orbit.
9. State Modern periodic law.
10. Define periodicity. Write its main cause.
11. Define isoelectronic species with suitable examples.
12. Compare the size of F- and Na+ with Ne.
13. What do you mean by ionization energy?
14. Which one has greater ionization energy and why? N or O.
15. Differentiate between electron affinity and electronegativity.
16. Explain why halogens have highest electron affinity?
17. Which one has higher electron affinity, F or Cl? Give reason.
18. State Mendeleev's periodic law.

**Group: B**

1. Derive the relation PV=nRT.
2. Describe Rutherford's experiment of α-particles scattering.
3. What were the observations and conclusions made by Rutherford based upon his experiment.
4. Write down the main postulates of Bohr's atomic model. Describe the origin of hydrogen spectra given by Bohr's list the different spectral series with neat and labelled diagram.
5. What are the advantages of modern periodic table? Describe.
6. Describe the factors affecting ionization energy.
7. Classify the elements on the basis of different block. Write two features of each block.
8. Explain the laboratory preparation of H2S gas.
9. Describe the preparation of H2S gas by using Kipp's apparatus.
10. Explain the use of H2S gas in qualitative analysis.

**Numerical**

1. The mass of 525 cc of a gas compound at 28°C and 730 mm of Hg pressure was found to be 0.9gm. What will be the volume of 2 gm of the gas at 30°C and 760 mm of Hg pressure. [R=0.0821 Mol-1]
2. How much increase in temperature is necessary to increase volume of half litre of the gas by 40% at 25°C, keeping the pressure constant?
3. An evacuated glass vessel weighs 50gm when empty, 148gm when filled with liquid of density 0.09g/cc and 50.5g when filled with an ideal gas at 760mmHg at 27°C. Calculate the volume of ideal gas at STP.
4. A saturated hydrocarbon having molecular formula CnH2n+2 diffuses through a porous membrane twice as fast as sulphur dioxide. Calculate the volume occupied by the hydrocarbon at 27°C and 2 atm pressure..

**Dashain Home Assignment-2076**

**Class: XI Subject: Physics**

**Group: A**

**(Compulsory for All Students)**

1. Convert 100 Joules into erge by using dimensional analysis.
2. Two forces 40 N and 50 N are inclined at angle 30° to each other. What is magnitude and direction of resultant?
3. An object is dropped from the top of the tower of height 156.8 m and the same time another object is thrown vertically upward with the velocity of 78.4 ms-1 from the foot of the tower, when and where the two objects meet?
4. A body is dropped from a tower of height 100m. Calculate:
5. The time to reach the ground
6. The velocity with which the body strikes the ground. [ g = 10 ms-2]
7. A clock which has brass pendulum beats seconds correctly when the temperature of the room is 30°C. How many seconds will it gain or lose per day when the temperature of the room falls to 10°C [Linear expansivity of brass = 1.9 ×10-5 °C-1]
8. A glass flask whose volume is exactly 1000 cm3 at 0 °C is filled completely with mercury at this temperature, When the flask and mercury are heated to 100 °C, how much mercury will over flow [ ]
9. An object 10 cm height is placed in front of a convex mirror of focal length 20 cm and the object is 30 cm from the mirror. Find the height of the image.
10. A glass rod is rubbed with silk and acquires a change of magnitude 7.5 nc. What is the change in mass of the rod?

**Group: B**

**(Compulsory only for who have failed in First Unit Test)**

1. A Sphere of radius ‘r’ moving through fluid of density ‘’ with high velocity ‘v’ experience a retarding force ‘F’ given by F = , Where K is dimensionless constant. Use method of dimension to find the value of x, y and z.
2. State the Parallelogram law of vector addition. Derive the magnitude and direction of the resultant vector.
3. A stone is projected with velocity ‘u’ in a direction making an angle ‘’ with horizontal. Show that path is parabolic. Derive expression for:
4. Maximum height
5. Time of flight
6. Horizontal range
7. Velocity after time ‘t’.
8. Define average and instantaneous velocity. Derive an expression for. Distance travelled in tth second by object moving with initial velocity ‘u’ and uniform acceleration ‘a’.
9. A projectile fired horizontally from the top of tower show that path is parabolic. Also derive expression for its time of flight, horizontal range and velocity at any instant.
10. Define linear expansivity and cubical expansivity. Find the relation in between them ().
11. Define linear and superficial Expansivities. Derive relation between them ().
12. How can you determine linear expansivity of a material by using pullinger’s apparatus?
13. Explain how you determine specific heat of a solid by the method of mixture?
14. Obtain mirror formula for concave mirror and convex mirror.
15. What is Lateral Shift? Derive expression for its value. How does the Lateral Shift change with the increase in the angle of incidence?
16. What do you understand by electrostatic induction? How can you change a body positively and negatively by induction?

**(SUBJECT: MATHEMATICS)**

**Group: A**

**(Compulsory for All Students)**

1. Define limit of a function at a point.
2. Evaluate
3. Prove that geometrically
4. Evaluate
   1. i.

ii.

* 1. i

ii.

1. A function f(x) is defined in the following way. Show that f(x) is continuous at x = 1 and x = 2.
2. Find the value for constant number such that the function is continuous. *If*  at x = 2
3. Evaluate
   1. , find n
4. Define the terms
   1. Left hand limit and Right hand limits
   2. continuity and discontinuity
   3. Derivative
5. State and prove De-Morgan's law.
6. If A, B, C is subset of universal set U. Then show that:
   1. A - (B ∩ C) = (A - B) U (A - C)
   2. A ∆ B = ( A - B ) U (B - A)
   3. A U ((B ∩ C) = (A U B) ∩ (A U C)
7. For any two real numbers x and y. Prove
   1. |x + y | ≤ |x| + |y|
   2. |x - y| ≥ |x| - |y|
8. Solve the following inequalities
   1. 6 + 5x - x2 ≥ 0
   2. |x + 2| < 4
9. If x belongs to R and 'a' be any positive real number then and conversely.
10. Define function, domain, range, onto, one to one function.
11. Let a function f: A→B defined by with A = {-1, 0, 1, 2, 3, 4} and. Find the range of f. Is the function f one-one and onto both? If not, how can the function be made one-one and onto both?
12. Define
    1. Inverse of a matrix
    2. triangular matrix
    3. symmetric matrix
    4. skew symmetric matrix  
       with examples
13. Construct a 3×3 matrix whose elements are aij = i+2j
14. Construct a 3×2 matrix whose elements aij are given by aij = 3j-i.
15. If and , find a matrix X such that 2A + 3X = 5B
16. If , show that A2-4A-5I=0 where I and 0 are 3×3 unit matrix and null matrix respectively.
17. Let be a 2×2 matrix.   
    Show that AA-1 = A-1A =
18. Express the following matrix in the sum of symmetric and skew symmetric matrix.
19. Evaluate the following determinant by expanding
20. Without expanding, prove that
21. Show that:
22. Show that

**Group: B**

**(Compulsory for failure students in First Unit Test)**

1. a) Define power set. Write the power set of A = {x, y, z}

b) Rewrite |2x - 1| ≤ 5 without using absolute value sign.

c) Let A = {a, b}, B = {b, c} and C = {c, d}. Find (A × B) U (A × C)

2. a) Define one to one and onto function.

b) Let A = {-1, 0, 2, 4, 6} and a function f: A→R is defined by. Find the range of f.

c) Define diagonal matrix with example.

3. a) If , show that A2-2A-5I=0 where I be a 2 × 2 unit matrix and O be the 2 × 2 null matrix.

b) Evaluate by Sarrus rule:

c) Evaluate:

4. a) Evaluate

b) Evaluate:

c) Find the limit if it exists:

5. a) Evaluate:

b) Evaluate:

c) Solve the linear equation by inverse matrix method

3x + 2y = 4

x – 2y = 0

**Group B**

6. a) In a group of student, 18 read biology, 19 read chemistry, and 16 read physics. 6 read biology only, 9 read chemistry only, 5 read biology and chemistry only and 2 read chemistry and physics only.

i. How many read all three subjects?

ii. How many read biology and physics only?

iii. How many read physics only?

iv. How many students are there all together?

b) A) Define conjunction. Construct truth table for compound statements.

B) If A, B and C be the subset of a universal set U. Show that

i. A U (B ∩ C) = (A U B) ∩ (A U C) ii. A ∩ (B U C) = (A ∩ B) U (A ∩ C)

7. a) Define absolute value of a real number. If x and y be two real numbers. Then show that

i. |x + y| ≤ |x| + |y|

ii. |x – y| ≥ |x| - |y|

b) i) Prove that

ii) Prove that

8. a) Without expanding the determinant show that

b) Solve the following system by Cramer's rule.

x + 2y – 3z = 9

2x – y + 2z = -8

3x – y – 4z = 3

9. a) Find the inverse of

b) i) Evaluate:

ii) Evaluate:

10. a) A function f(x) is defined as .

Show that the function is discontinuous at x = 4. Is it possible to make it continuous at x = 4. If possible, how?

b) Find the derivative of from the first principle

**Group C**

11. Let a function f: A→B be defined by with A = {-1, 0, 1, 2, 3, 4} and. Find the range of f. Is the function f one-one and onto both?

12. Define symmetric matrix. Prove that

13. Evaluate:

14. Define composite function. Prove that a function f: R→R defined by f(x)=x3 is one-one and onto.

15. Find the derivative of tanx by first principle.

**DASHAIN HOME ASSIGNMENT-2076**

**Class- XI SUBJECT: BOTANY**

1. Answer in very short.
2. Define taxonomy.
3. What do you understand by systematics?
4. Define binomial nomenclature.
5. Who gave five kingdom classification?
6. Which kingdom includes prokaryotic organisms?
7. What are reserve food materials of fungi?
8. Name the photosynthetic pigments found in Cyanobacteria.
9. What it the function of chondroid?
10. Which cell organelle is known as dictyosome?
11. What do you understand by ergastic substance?
12. Define totipotency.
13. Who proposed cell theory?
14. Answer in short.
15. List down rules for writing scientific names.
16. Differentiate between Gram positive and Gram negative bacteria.
17. List down diagnostic characteristics of Kingdom-Plantae.
18. Explain golgicomplex , their structure and functions.
19. Explain Steward’s experiment of regeneration of plantlets from phloem.
20. Differentiate between smooth and rough Endoplasmic reticulum.
21. Answer in detail
22. Explain all three types of plastids.(diagram, structure and functions).
23. Explain different types of nutrition found in bacteria.
24. Explain structure and functions of mitochondria. Differentiate between mitochondria and chloroplasts.

**DASHAIN HOME ASSIGNMENT-2076**

**Class- XI SUBJECT: Zoology**

1. Answer in very short.
2. Why biology is called exceptional science? Give two reasons.
3. Define Recapitulation theory.
4. Which pigments gives coloration to the earthworm.
5. In which class the earthworm belongs to?
6. When the earth was originated?
7. Define *Metameric* segmentation.
8. Define molicular biology.
9. How biology is related to chemistry?
10. Define parallel evolution.
11. Mention the position of spermathecae.
12. Define Atavism.
13. Answer in short.
14. Explain the vestigial organs as evidence of evolution.
15. Describe the nervous system of earthworm.
16. Explain one of the experiments on biogenesis.
17. Birds are the glorified reptiles. Explain it.
18. Explain the structure of setae in earthworm.
19. Explain cognogony on origin of life.
20. Explain briefly about septal nephridia of earthworm.
21. Explain the external aperture of Earthworm.
22. Explain the homologous organs.
23. Describe about T.C of pharynx of Earthworm.
24. Describe chemogeny on origin of life.