

ST. MICHAEL'S SR SEC SCHOOL
3, PUSA ROAD, NEW DELHI
CLASS 11, ASSIGNMENT (MID TERM) (2026-27)

1. COMPUTER SC.WITH PYTHON

1. Find errors in the following code and correct them by rewriting full code and underlining corrections

```
code=input("Enter season code:")
if code=w:
    print("winter season")
elif code==r:
    PRINT("rainy season")
else:
    Print("summer season")
```

2. Write the output of the following code

- a) for i in '123': print("guru99",i,)
 - b) for i in : print(i) [100][200][300]
 - c) for j in range(10,6,-2): print(j*2)
 - d) for x in range(1,6): for y in range(1,x+1): print(x, ' ',y)
3. a) for x in range(10,20): if (x == 15): break print(x)
b) for x in range(10,20): if (x % 2 == 0): continue print(x)
4. Guruji Astro is an astrological firm that provides complete guidance on Indian astrology and free horoscope predictions.

In order to provide computerized horoscopes in no time, the firm hired a software developer to develop a Python program for the given requirement. Help him write a program to display astrological sign for a given date of birth.

5. Write a python program that accepts marks in five subjects and outputs average marks.
6. The following questions contain two statements: Assertion and Reasoning. Each question has four choices— (i), (ii), (iii), (iv)—only one of which is correct. In the light of these statements, choose the most appropriate option.
- (i) Both A and R are true and R is the correct explanation of A.
 - (ii) Both A and R are true but R is not the correct explanation of A.
 - (iii) A is true but R is false.
 - (iv) A is false but R is true.

Assertion (A): Python is a cross-platform language.

Reasoning (R): Python code can run on a variety of platforms which makes programs very portable a program written in one platform can easily be used on another.

7. Assertion (A): Python comes with its own IDLE.
Reasoning (R): IDLE is Python's Integrated Development and Learning Environment which a programmers to easily write, modify and execute Python programs.

8. Find the output of the following.

```
word = 'work hard'
result = word.find('work')
print("Substring, 'work', found at index:", result )
result = word.find('har')
print("Substring, 'har' ,found at index:", result )
if (word.find('pawan') != -1):
    print("Contains given substring ")
else:
    print("Doesn't contain given substring")
```

9. Write a program in python to count number of vowels in a given string.
10. The record of a student (Name, Roll No., Marks in five subjects and Percentage of marks) is stored in the following list:
stRecord = ['Raman', 'A-36', [56,98,99,72,69], 78.8]
Write Python statements to retrieve the following information from the list stRecord.
- (a) Percentage of the student
 - (b) Marks in the fifth subject
 - (c) Maximum marks of the student
 - (d) Roll No. of the student
 - (e) Change the name of the student from 'Raman' to 'Raghav'.

2. ENGLISH

1. Fill in the blanks with the correct tense.

- a) By next Monday, she _____ (submit) her assignment.
- b) When I reached the station, the train _____ (already/leave).
- c) He usually _____ (read) novels in the evening.
- d) At this time tomorrow, we _____ (sit) in the examination hall.

2. Fill in the blanks with the correct clause.

- a) She said that she _____ tired. (*Noun Clause*)
- b) We stayed indoors _____ it was raining heavily. (*Adverb Clause of Reason*)
- c) Do you remember the day _____ we first met? (*Relative Clause*)
- d) He works hard _____ he may achieve success. (*Adverb Clause of Purpose*)

3. Change the following to reported speech.
 - a) The scientist said, "If we don't act now, the planet will suffer irreparable damage."
 - b) The judge asked the witness, "Why did you not report the incident immediately?"
4. Rewrite in passive voice:
 - a) He is writing a letter to his friend.
 - b) They had finished the work before sunset.
5. Rearrange to form meaningful sentences:
 - a) / ignored / warnings / despite / the / continued / villagers / flood / the / of
 - b) / conference / postponed / reasons / unforeseen / the / was / due / international
6. Singh's personal recollection of his grandmother and Zahi Hawass's scientific exploration of Tutankhamun both attempt to preserve memory. How do personal narrative and scientific inquiry differ in their approach to legacy?
7. What qualities of leadership and teamwork helped the family survive the storm? Illustrate with examples from the text.
8. How do Aram and Mourad's actions reflect the tension between youthful adventure and the Armenian tradition of honesty?
9. Why does the narrator feel alienated when she visits Mrs. Dorling's house? How do the household objects become symbols of memory and loss?
10. Both *A Photograph* and *The Laburnum Top* reflect on the passage of time and the inevitability of change, yet they do so through different lenses, memory of human loss and observation of nature's cycles. Discuss how the two poems use imagery and symbolism to portray transience.

3. PHYSICS

Q1 State the principle of homogeneity of dimensions.

Q2 A gas bubble from an explosion under water oscillates with a period T proportional to $p^a d^b E^c$, where p is static pressure, d is density of water and E is total energy of explosion. Find the values of a , b and c .

Q3 Period of vibration T of a tuning fork depends on the length l of its prong, density d and Young's modulus Y of its material. Deduce an expression for the period of vibration T on the basis of dimensional analysis.

Q4 If the value of surface tension of water is 72 dynes/cm . Express it in SI units, using the method of dimensional analysis.

Q5 Find the value of 100 J on a system which has 20 cm, 250 gm and half a minute as fundamental units of length, mass and time.

Q6 Find the dimensions of $a \times b$ in the relation $P = (b - x^2)/at$, where P is power, x is distance and t is time.

Q7 Using Graphical method **OR** Calculus method, deduce equations of motion for an object moving with uniform acceleration along a straight line.

Q8 State Parallelogram law or Triangle law of Vector Addition. Two Vectors A and B are inclined to each other at an angle θ . Using Triangle law, find the magnitude and direction of the Resultant vector.

Q9 Two equal forces have the square of their resultant equal to three times their product. Find the angle between them.

Q10 What is resolution of a vector. Prove that resolution of a vector is unique.

Q11 Define uniform velocity. Show that two dimensional uniform velocity motion is equivalent to two one dimensional uniform velocity motions along two perpendicular directions.

Q12 Give geometrical interpretation of Vector product of two vectors **OR** Scalar product of two vectors.

Q13 A Projectile is fired with a Velocity u making an angle θ with the Horizontal. Show that its trajectory is a parabola. Derive Expressions for (i) Maximum Height of a Projectile (ii) Horizontal Range and (iii) Time of Flight of a Projectile. Show that there are two angles of projection, for which the horizontal range is same for a projectile.

Q14 Find the angle of projection for which horizontal range and maximum height are equal.

Q15 Justify the statement that a uniform circular motion is an accelerated motion. Derive expression for Centripetal acceleration of a body moving in a circular path of radius r with uniform speed v . What will be the direction of this acceleration.

Q16 Calculate angular velocity of a second hand and minute hand of a clock.

Q17 Prove that Newton's second law is the real law of motion.

Q18 State and prove law of conservation of momentum.

Q19 Why does a gun recoil on firing. What is recoil velocity. Derive expression for it.

Q20 A car of mass 1000 kg is moving with a velocity of 10 m/s and is acted upon by a forward force of 1000 N due to engine and retarding force of 500 N due to friction. What will be its velocity after 10 seconds.

Q21 Define the term Impulse. Prove that Impulse of a force is equal to change in momentum.

Q22 The coefficient of friction between the ground and the wheels of a car moving on a horizontal road is 0.5. If the car starts from rest, what is the minimum distance in which it can acquire a speed of 72 km/hr.

Q23 With the help of a suitable diagram, derive expression for the maximum speed with which a vehicle can safely negotiate a curved road banked at an angle θ . The coefficient of friction between the wheels and road is μ .

Q24 State and prove work energy theorem for a constant force **OR** variable force.

Q25 An electric motor is used to lift an elevator and its load (total mass = 1500 kg) to a height of 20 m. The time taken for the job is 20 s. What is the work done. What is the rate at which work is done. If the efficiency of the motor is 75%, at what rate is the energy supplied to the motor.

Q26(a) If the kinetic energy of a body increases by 200%, by what % will the linear momentum of the body increase.

(b) A light body and heavy body have the same momentum. Which one will have greater kinetic energy.

Q27. Define Elastic collision. Two bodies of masses m_1 and m_2 moving with velocities u_1 and u_2 undergo one dimensional elastic collision. Determine their velocities after collision

Q28. What is perfectly inelastic collision. Show that kinetic energy is invariably lost in such a collision.

Q29 A body of mass m strikes a stationary body of mass M and undergoes an elastic collision. After collision, m has a speed one-third of its initial speed. What is the ratio M/m .

Q30(a) Can a body have (i) momentum without energy and (ii) energy without momentum.

4. BIOLOGY

1. A newly discovered organism shows cellular organisation, metabolism and the ability to reproduce, but it does not maintain a stable internal environment. Would you classify it as a living organism? Give a logical justification based on the characteristics of living organisms.

2. An organism is unicellular, lacks a membrane-bound nucleus, possesses a cell wall and reproduces mainly by binary fission. Another organism is also unicellular but has a true nucleus and membrane-bound organelles. Explain why placing both organisms in the same kingdom would be scientifically inappropriate.

3. A plant produces spores but does not produce seeds. It possesses vascular tissues and has a clearly differentiated plant body. Which major plant group would you expect it to belong to? Explain how the presence or absence of vascular tissue and seeds helps distinguish plant groups.

4. Two animals have the same level of organisation and are both bilaterally symmetrical, but one possesses a true coelom while the other does not. Explain why the presence of a coelom is considered an important criterion in animal classification and how it can influence body organisation.

- 5.** A plant has a weak stem that cannot remain upright without support and develops roots from regions other than the radicle. Based on these characteristics, what modifications might its stem and root system have undergone? Explain how such modifications can provide an adaptive advantage.
- 6.** A plant is exposed to strong winds for several months. Predict two anatomical changes you would expect in its supporting tissues and explain how these changes would help the plant withstand mechanical stress.
- 7.** A person moves from sea level to a high-altitude region where atmospheric oxygen pressure is lower. Predict two immediate changes in the respiratory system and explain why they help maintain adequate oxygen supply to the tissues.
- 8.** A person has a significantly reduced red blood cell count but normal blood volume. Explain why this person may experience fatigue and breathlessness even though blood is still circulating normally. Relate your answer to the functions of haemoglobin and oxygen transport.
- 9.** If the sinoatrial node of the human heart stops generating normal impulses, how would this affect the heartbeat? Explain why the SA node is called the natural pacemaker and what could happen to the normal cardiac rhythm.
- 10.** During vigorous exercise, the breathing rate and depth increase considerably. Explain why this happens and how the changes help maintain the oxygen and carbon dioxide balance of the body.

5. MATHEMATICS

- Q1. A committee of 5 members is to be formed from 7 men and 6 women such that it contains at least 3 women. Find the number of different committees that can be formed.
- Q2. From the letters of the word MATHEMATICS, how many different words can be formed if all letters are used and all the vowels are together?
- Q3. A number greater than 5,00,000 is formed using the digits 1, 2, 3, 4, 5, 6 without repetition. How many such numbers are divisible by 5?
- Q4. In how many ways can 8 students be seated in a row if:
- (i) Two particular students never sit together?
 - (ii) Three particular students always sit together?

- Q5. Seven different Mathematics books and five different Physics books are to be arranged on a shelf so that all the Mathematics books remain together and all the Physics books remain together. Find the number of arrangements.
- Q6. A cricket team of 11 players is to be selected from 8 batsmen, 6 bowlers and 3 all-rounders. The team must contain exactly 5 batsmen, at least 4 bowlers and at least 1 all-rounder. Find the number of possible teams.
- Q7. Five boys and four girls are to stand in a row for a photograph such that no two girls stand together. Find the number of arrangements.
- Q8. Find the number of six-digit even numbers that can be formed using the digits 0, 1, 2, 3, 4, 5, 6 without repetition.
- Q9. In how many ways can the letters of the word **ENGINEERING** be arranged so that no two vowels are adjacent?
- Q10. A box contains 12 different balls. In how many ways can 5 balls be selected if:
- (i) Two particular balls must be selected.
 - (ii) Two particular balls are never selected together.
- Q11. Ten students are to be divided into three groups containing 2, 3 and 5 students respectively. Find the number of different divisions.
- Q12. Find the number of arrangements of the letters of the word **ARRANGEMENT** such that all the vowels come together.
- Q13. Three identical red balls, four identical blue balls and five identical green balls are to be arranged in a straight line. Find the number of distinct arrangements.
- Q14. Four married couples are to be seated around a circular table. Find the number of arrangements if no husband sits adjacent to his wife.
- Q15. A school wants to appoint a Head Boy, Head Girl, Sports Captain, Cultural Captain and Discipline Captain from 12 boys and 10 girls. The Head Girl must be a girl, the Head Boy must be a boy, while the remaining three posts may be filled by anyone. Find the number of possible selections.
- Q16. Find the coefficient of x^7 in the expansion of $(2x - 3)^9$.
- Q17. Expand $(2x-3)^9$.
- Q18. Using the Binomial Theorem, prove that $11^{2n} - 1$ is divisible by 120 for every natural number n .
- Q19. Using the Binomial Theorem, prove that $9^n - 1$ is divisible by 8 for every natural number n .
- Q20. If the coefficient of x^3 in the expansion of $(1 + x)^n$ is 220, find the value of n .

6. PHYSICAL EDUCATION

1. A Class 11 student wants to pursue a career in sports but is confused between becoming a coach, a sports journalist, and a fitness trainer. Based on the career avenues discussed in Physical Education, outline the qualifications, skill sets, and typical career path for each option so the student can make an informed choice.
2. Your school has been selected to host an "Olympic Day" celebration. As the student coordinator, design an activity plan that authentically reflects at least three Olympic values (excellence, friendship, respect) and explain how each planned activity embodies that value.
3. A 45-year-old sedentary office worker complains of low energy, weight gain, and poor sleep. Using the components of physical fitness and wellness, design a practical weekly lifestyle plan (including physical activity, rest, and diet pointers) to help this person improve their overall wellness.
4. A Class 11 school has admitted a student with locomotor disability (CWSN) who wants to participate in the annual sports day. As the PE teacher, identify two suitable adapted sports/games for this student and explain what modifications in equipment, rules, or environment would be needed.
5. A group of Class 12 students is preparing for board exams and reports high stress and anxiety. Recommend a set of yogic asanas and pranayama techniques appropriate for stress management, and justify your selection based on their physiological/psychological benefits.
6. A newly appointed PE teacher at a rural school has no budget for sports equipment but is expected to run a fitness program for 200 students. Suggest low-cost/no-cost strategies to develop physical fitness components (strength, endurance, flexibility) among students, referencing test/training principles from the syllabus.
7. During the school's Olympic Day event, a heated argument breaks out between two teams over a disputed decision, threatening the spirit of fair play. As a student leader, explain how you would use the Olympic values of respect and fair play to resolve the conflict, and suggest a preventive measure for future events.

8. Two Class 11 students — one an athletic, high-energy learner and one who is overweight and reluctant to exercise — are placed in the same PE class. Using the concept of "wellness" as distinct from mere "fitness," design differentiated activity goals and motivational strategies for each student.
9. A CWSN student with visual impairment is being considered for the school's inclusive sports program. Identify one team sport and one individual sport suitable for this student, and describe the necessary equipment modifications and safety precautions for each.
10. A student athlete practicing yoga for the first time struggles with breathing coordination in Pranayama and often feels dizzy. As a yoga instructor, explain the likely causes and outline corrective steps/precautions to help the student practice safely.

CLASS XI CHEMISTRY ASSIGNMENT-2026

1. A sample of hydrated sodium carbonate, $\text{Na}_2\text{CO}_3 \cdot x\text{H}_2\text{O}$, contains 37.07% water by mass. Calculate the value of x .
2. A compound contains 24.24% C, 4.04% H and the remaining oxygen. If its molar mass is 198 g mol^{-1} , determine its molecular formula.
3. A gaseous hydrocarbon contains 85.7% carbon and 14.3% hydrogen by mass. Its vapour density is 14. Determine its molecular formula.
4. A mixture contains 4 g H_2 , 16 g O_2 and 44 g CO_2 . Calculate:
 - (i) Total number of moles
 - (ii) Mole fraction of each gas.
5. 2.30 g of sodium reacts completely with water. Calculate:
 - (i) Moles of sodium reacted
 - (ii) Volume of H_2 produced at STP.
6. Calculate the number of electrons present in 5.6 g of iron.
7. 10 g of CaCO_3 on heating decomposes completely. Calculate the mass of CaO and CO_2 obtained.
8. Calculate the percentage composition of water of crystallization in $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$.
9. Balance the following equations by the oxidation number method:
 - (a) $\text{KMnO}_4 + \text{HCl} \rightarrow \text{KCl} + \text{MnCl}_2 + \text{Cl}_2 + \text{H}_2\text{O}$
 - (b) $\text{K}_2\text{Cr}_2\text{O}_7 + \text{KI} + \text{H}_2\text{SO}_4 \rightarrow \text{Cr}_2(\text{SO}_4)_3 + \text{I}_2 + \text{K}_2\text{SO}_4 + \text{H}_2\text{O}$
10. A solution contains 5.85 g NaCl in 500 mL solution. Calculate:
 - (i) Molarity
 - (ii) Molality (density = 1 g mL^{-1})
11. Derive the expression for the radius of the n th Bohr orbit.
12. Derive the expression for the energy of an electron in the n th orbit.
13. Calculate the wavelength of radiation required to excite an electron from $n = 2$ to $n = 5$ in hydrogen atom.
14. Calculate the de Broglie wavelength associated with an electron accelerated through a potential difference of 150 V.
15. Calculate the uncertainty in the position of an electron if its uncertainty in velocity is $5.8 \times 10^5 \text{ m s}^{-1}$.
16. Write the electronic configurations of:
 - Cr

- Cu
- Mo
- Ag

Explain the exceptions.

17. Explain the significance of the four quantum numbers. How many orbitals are possible for $n = 4$?

18. Calculate the maximum number of electrons having:

- $n = 4$
- $l = 3$
- $m = +1$

19. Arrange the following in increasing order of energy:

3s, 3p, 4s, 3d, 4p

20. Explain:

- Aufbau Principle
- Pauli Exclusion Principle
- Hund's Rule

with suitable examples.

21. Explain the anomalous behaviour of the first element of each group.

22. Explain why the second ionization enthalpy of sodium is much higher than its first ionization enthalpy.

23. Explain why electron gain enthalpy of fluorine is less negative than chlorine.

24. Arrange the following in increasing order with proper reason:

- Atomic radius:
Na⁺, Mg²⁺, Al³⁺, Ne

25. Arrange in increasing order of ionization enthalpy:

O, N, F, Be, B

26. Explain why Be does not form Be²⁺ easily whereas Mg does.

27. Compare the oxidizing and reducing behaviour of halogens and alkali metals.

28. Explain the variation of metallic and non-metallic character across a period and down a group.

29. Explain why noble gases have almost zero electron gain enthalpy.

30. Predict the position of an element having the electronic configuration:

1s²2s²2p⁶3s²3p⁵

31. Explain the formation of NaCl using Born-Haber Cycle.

32. State and explain Fajan's Rule with suitable examples.

33. Explain the factors affecting lattice enthalpy.

34. Explain VSEPR theory. Predict the shapes and bond angles of:

- NH_3
- H_2O
- SF_4
- ClF_3
- XeF_4

35. Explain the hybridization and geometry of:

- NH_4^+
- SO_4^{2-}
- PCl_5
- SF_6

36. Explain Molecular Orbital Theory for O_2 and discuss:

- Bond order
- Magnetic nature

37. Calculate the bond order of: using MOT with diagram

- O_2^+
- O_2^-
- O_2^{2-}
- N_2
- N_2^+

38. Differentiate between:

- Ionic bond
- Covalent bond
- Coordinate bond

with suitable examples.

39. Explain hydrogen bonding and discuss its effect on:

- Boiling point
- Solubility
- Density of ice

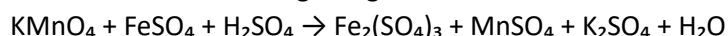
40. Draw the Lewis structures of:

- SO_2
- SO_3
- HNO_3
- CO_3^{2-}
- NH_4^+

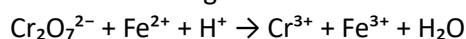
41. Calculate the oxidation numbers of:

- Mn in KMnO_4
- Cr in $\text{K}_2\text{Cr}_2\text{O}_7$
- Cl in KClO_4
- S in $\text{Na}_2\text{S}_2\text{O}_3$

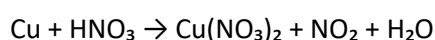
42. Balance the following using oxidation number method:



43. Balance using ion-electron method:



44. Balance:

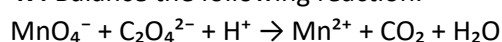


45. Identify the oxidizing agent, reducing agent, oxidized species and reduced species in:

- $\text{Zn} + \text{CuSO}_4 \rightarrow \text{ZnSO}_4 + \text{Cu}$
- $\text{Cl}_2 + 2\text{KI} \rightarrow 2\text{KCl} + \text{I}_2$

46. Explain disproportionation and combination reactions with two examples each.

47. Balance the following reaction:



48. A sample containing 3.16 g KMnO_4 reacts completely with FeSO_4 in acidic medium. Calculate the mass of FeSO_4 required.

49. A compound contains Mn in +7 oxidation state. Calculate the equivalent weight of KMnO_4 in:

- (i) Acidic medium
- (ii) Neutral medium
- (iii) Alkaline medium

50. Explain the applications of redox reactions in:

- Metallurgy
- Corrosion
- Bleaching
- Respiration

- Photosynthesis
- Electrochemical cells

CLASS 11, VALUE EDUCATION ASSIGNMENT

Fill in the blanks with suitable words.

1. A _____ person is calm, unemotional and neutral.
2. Make prayer your _____ wheel and not your spare wheel.
3. People who are shy are generally not able to make _____ contact.
4. _____ of failure is something we all experience.

State whether the given statements are True or False.

5. Even the most confident people have insecurities.
6. People may have same experiences in life.
7. There are no positive effects of fear.
8. Visualisation can help deal with real life scenarios.

Answer the following questions in 40-50 words.

9. Explain failure as a process or a phase in life.
10. Explain the origins of self-hate.