

St. Mary's School, Dwarka
Holiday Homework
Class XII
Week 2
Worksheet 2

Subject: English

M.M-25

Q1. Read the following passage carefully.

1. A British survey found that 44% of the firms, which started to use robots, met with initial failure and 22% abandoned them altogether, mainly because of inadequate technological know-how and skills at all plant levels.
2. Robotization is, by and large, a viable proposition. The machines can work round the clock, raise output, protect quality and industrial competitiveness.
3. One robot can replace between two and five production workers, while providing cheaper labour. In the US car industry, a man-hour costs around 23 dollars but a robot-hour costs around 6 dollars.
4. Certain jobs, mostly simple of hazardous ones, are irretrievable lost to robotics. Thus, spot welders, press operators, spray painters, cleaners, machine loaders, grinding and polishing machine operators are endangered species.

Based on the understanding of the passage, answer the questions given below: (1X5=5)

- a) What does the writer say about the inceptive failure of robots?
- b) In what sense is the word 'robotization' used in the second paragraph?
- c) What are robots a substitute for?
- d) What does the expression 'viable proposition' mean?
- e) In its context the expression 'endangered species' means _____.

Q2. Prepare a poster for an Inter-School Poetry Recitation Contest that the Hindi Sahitya Sabha of D.A.V. Sr. Sec. School, Ambala is organizing to celebrate the birthday of Munshi Prem Chand. You are the secretary of the Hindi Sahitya Sabha. (Word limit- 50 words) (3)

Q3. You, Avinash Aneja, the Librarian, Vivekananda Senior Secondary School, Vikas Puri, Delhi had ordered two sets each of World History in Pictures (5 Volumes), Nature Study (16 Volumes), and The Story of Science (16 Volumes) from M/s Universal Book Suppliers, 14, Ram Nath, Chandni Chowk, Delhi. Unfortunately, on the receiving the books, you found that some volumes were missing in the sets and some were damaged. Write a letter complaining about the defective, deficient supply and ask them to rectify the situation in not more than 150-200 words. (5)

Q4. Read the extracts given below and answer the questions that follow:

(1X6=6)

I. ‘His face, I see, has lost the carefree look. The steel canister seems heavier than the plastic bag he would carry so lightly over his shoulders. The bag was his. The canister belongs to the man who owns the tea shop. Saheb is no longer his own master!’

- a) **Why had his face lost the carefree look?**
- b) **Why was the steel canister heavier than his bag?**
- c) **What has been the effect of the changed situation on Saheb?**

II. ‘...of a corpse and realized with pain
that she was as old as she looked but soon
put that thought away, and looked out at Young
Trees sprinting, the merry children spilling
out of their homes...’

- a) **What did the poet realize with pain?**
- b) **What did she do after the painful realization dawned upon her?**
- c) **Which poetic device is used in ‘trees sprinting’?**

Q5. Answer the following questions briefly in 30-40 words.

(2X3=6)

- a) The announcement of the change in government left M. Hamel heartbroken. How did Franz realize this?
- b) The poem (My Mother at Sixty-Six) has come to a full cycle through the thought process of the poet. Comment.
- c) Bring out the irony in Saheb’s name.

Subject: Physics

No. of Questions: 10

M.M: 25

Objectives:

- Revision of concepts
- Application of the concepts to real life situations.
- Skills to carry out research work and develop scientific aptitude.

Instructions:

- Neatly write all the answers in your notebook.
- Attempt the questions keeping in mind the weightage of each question

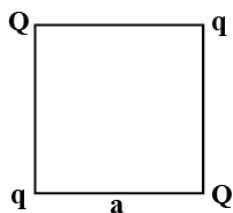
Q1. Charge Q is kept in a sphere of 5cm first than it is kept in a cube of side 5cm. The outgoing flux will be
(a) more in case of sphere (b) more in case of cube (1)
(c) same in both case (d) information incomplete

Q2. Electric field and electric potential inside a charged spherical shell: (1)
(a) $E = 0$; $V = 0$ (b) $E = 0$; $V \neq 0$ (c) $E \neq 0$; $V = 0$ (d) $E \neq 0$; $V \neq 0$

Q3 Electric Field is always: (1)
(a) Parallel to equipotential surface.
(b) Perpendicular to equipotential surface.
(c) It can be perpendicular and parallel as well.
(d) It does not depends on distribution of charge

Q4. (i) Define electric potential and give its SI unit .A metal sphere of radius 10cm is charged so as to have a potential of 50V on its outer surface. Find potential at the centre of the sphere . (2)

Q5. Four point charges Q, q, Q and q are placed at the corners of a square of side 'a' as shown in the figure. Find the resultant electric force on a charge Q . (2)



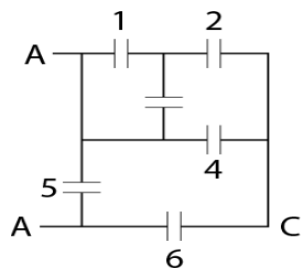
Q6. Find the ratio of the potential differences that must be applied across the parallel and series combination of two capacitors C_1 and C_2 with their capacitances in the ratio 1:2 so that the energy stored in the two cases becomes the same. (2)

Q7. Two charges $+q$ and $-q$ are kept at $(-x_1, 0)$ and $(+x_1, 0)$ respectively in the $x - y$ plane. Find the magnitude and direction of the net electric field as well as electric potential at the origin point $(0, 0)$. (3)

Q8. Use Gauss's law the electric field due to a uniformly charges infinite plane sheet. What is the direction of field for positive and negative charge densities? (3)

Q9. (i) Define dipole moment and give its SI unit. Derive the expression for the Torque acting on a dipole placed in an external electric field.(ii) What is the dipole moment for a dipole having charges of $-4C$ and $+4C$, separated by a distance of 0.01m? (3+2=5)

Q10. Find the equivalent capacitance between points A and B if capacitance of each capacitor is $2\ \mu\text{F}$.



(ii) Two capacitors of capacitance $C_1 = 6\ \mu\text{F}$ and $C_2 = 3\ \mu\text{F}$ are connected in series across a cell of emf 18 V. Calculate:

- The equivalent capacitance
- The potential difference across each capacitor
- The charge on each capacitor

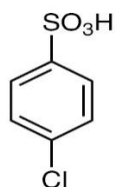
$$(2.5 + 2.5 = 5)$$

Subject – Chemistry

Q.1 Why is t-butyl bromide more reactive towards S_N1 reaction as compared to n-butyl bromide ? 1

Q.2 Define ambident nucleophile with an example 1

Q.3 Write IUPAC name of the following compound :





1

Q.4 (i) Out of $(CH_3)_3C - Br$ and $(CH_3)_3C - I$, which one is more reactive towards S_N1 and why ?

(ii) Write the product formed when p-nitrochlorobenzene is heated with aqueous NaOH at 443 K followed by acidification.

(iii) Why dextro and laevo – rotatory isomers of Butan-2-ol are difficult to separate by fractional distillation? 3

Q.5 (i) Out of  and , which one is more reactive towards S_N2 reaction and why ?

(ii) Out of chlorobenzene and 4-Chloro nitrobenzene, which one is more reactive towards S_N2 reaction and why ?

(iii) Out of 3-Methylbutan-1-ol and 3-Methylbutan-2-ol, which one is optically active and why ? 3

Q.6 Give reasons for the following :

(a) The presence of $-NO_2$ group at ortho or para position increases the reactivity of haloarenes towards nucleophilic substitution reactions.

(b) p-dichlorobenzene has higher melting point than that of ortho or meta isomer.

(c) Thionyl chloride method is preferred for preparing alkyl chloride from alcohols . 3

Q.7 Among all the isomers of molecular formula C_4H_9Br , identify :

(a) one isomer which is optically active.

(b) the one isomer which is highly reactive towards S_N2 .

(c) the two isomers which give same product on dehydrohalogenation with alcoholic KOH. 3

Q.8 (a) Out of chloro cyclohexane and chlorobenzene which one is more reactive towards nucleophilic substitution reaction and why ?

(b) Predict all the alkenes that would be formed by dehydrohalogenation of 2-bromobutane.

(c) Chloroform contains chlorine but it does not give white ppt with $AgNO_3$ solution, why ? 3

Q.9 (a) Define the following : (i) Enantiomers (ii) Racemic mixture

(b) Why is chlorobenzene resistant to nucleophilic substitution reaction ? 3

Q.10 (a) Write one stereochemical difference between S_N1 and S_N2 reactions.

(b) Why is $\text{CH}_2=\text{CH}-\text{CH}_2-\text{Cl}$ more easily hydrolysed than $\text{CH}_3-\text{CH}_2-\text{CH}_2-\text{Cl}$?

(c) Why is cyclohexyl chloride is more reactive than chlorobenzene ?

(d) Why is chloroform stored in dark coloured bottle ?

(e) What are the products of exhaustive ammonolysis of alkyl halide ?

5

Subject – Biology

Answer the following questions:

Q1. What is sporopollenin? (1)

Q2. Draw and label the important features of a pollen grain. (2)

Q3. Define syngamy and triple fusion. (2)

Q4. Name four agents of pollination. (2)

Q5. Draw a well labelled diagram to show reproductive parts of a typical angiosperm. (3)

Q6. Develop a graphic organizer to show the various events of sexual reproduction. (3)

Q7. Explain the process of microsporogenesis with the help of a well labelled diagram. (3)

Q8. With the help of labelled diagram explain the megasporogenesis in an angiosperm. (3)

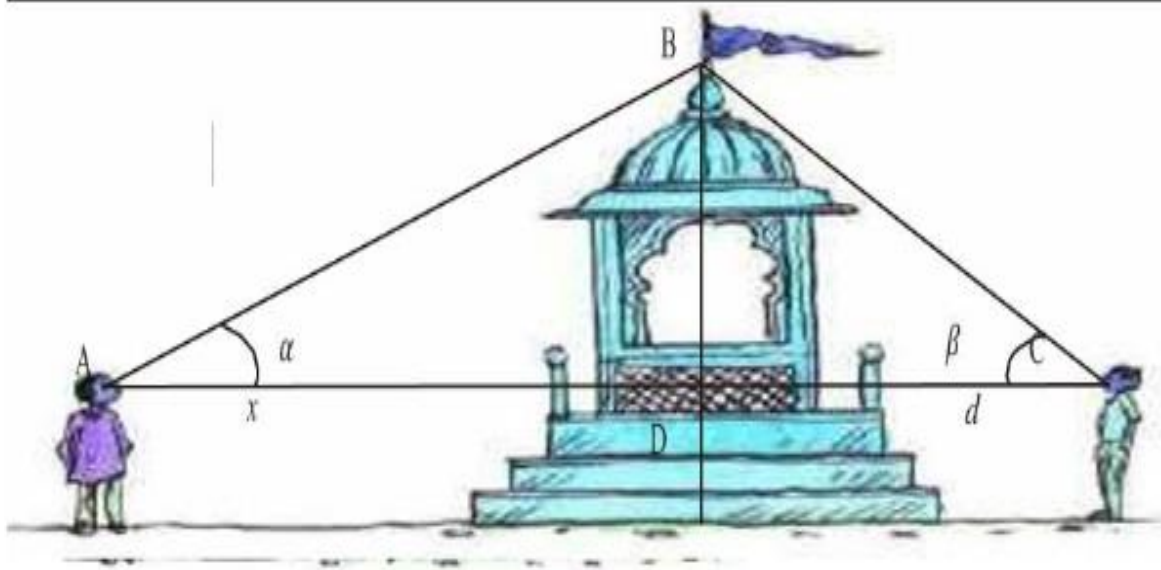
Q9. Explain the formation and distribution of the eight cells in a female gametophyte. (3)

Q10. What is pollination? Mention the different modes of pollination. (3)

Subject – Mathematics**(INVERSE TRIGONOMETRIC FUNCTIONS)**

Q1	<p>If $y = \cot^{-1}(\sqrt{\cos x}) - \tan^{-1}(\sqrt{\cos x})$,</p> <p>prove that $\sin y = \tan^2 \frac{x}{2}$.</p>
Q2	<p>If $\cos^{-1} \frac{x}{a} + \cos^{-1} \frac{y}{b} = \alpha$,</p> <p>prove that $\frac{x^2}{a^2} - \frac{2xy}{ab} \cos \alpha + \frac{y^2}{b^2} = \sin^2 \alpha$</p>
Q3	<p>Prove that :</p> $\tan^{-1} \frac{1-x}{1+x} - \tan^{-1} \frac{1-y}{1+y} = \sin^{-1} \frac{y-x}{\sqrt{1+x^2} \sqrt{1+y^2}}$
Q4	<p>Prove that</p> $\tan \left\{ \frac{\pi}{4} + \frac{1}{2} \cos^{-1} \frac{a}{b} \right\} + \tan \left\{ \frac{\pi}{4} - \frac{1}{2} \cos^{-1} \frac{a}{b} \right\} = \frac{2b}{a}$
Q5	<p>Solve the following equations :</p> <p>(i) $\tan^{-1} \frac{x-1}{x-2} + \tan^{-1} \frac{x+1}{x+2} = \frac{\pi}{4}$</p> <p>(ii) $\tan^{-1} 2x + \tan^{-1} 3x = \frac{\pi}{4}$</p> <p>(iii) $\tan^{-1} \frac{x-1}{x+1} + \tan^{-1} \frac{2x-1}{2x+1} = \tan^{-1} \frac{23}{36}$</p> <p>(iv) $2 \tan^{-1}(\cos x) = \tan^{-1}(2 \cos \sec x)$</p>
Q6	<p>Solve the following equations :</p> <p>(i) $\sin^{-1} \frac{3x}{5} + \sin^{-1} \frac{4x}{5} = \sin^{-1} x$</p> <p>(ii) $\sin^{-1}(1-x) - 2 \sin^{-1} x = \frac{\pi}{2}$</p> <p>(iii) $\sin[2 \cos^{-1}\{\cot(2 \tan^{-1} x)\}] = 0$</p>
Q7	<p>If $\cos^{-1} \frac{x}{2} + \cos^{-1} \frac{y}{3} = \alpha$, then</p> <p>prove that $9x^2 - 12xy \cos \alpha + 4y^2 = 36 \sin^2 \alpha$.</p>
Q8	<p>Solve:</p> <p>(1) $\cos^{-1} \left(\frac{x^2-1}{x^2+1} \right) + \tan^{-1} \left(\frac{2x}{x^2-1} \right) = \frac{2\pi}{3}$</p> <p>(2) $\sin 6x + \sin^{-1} 6\sqrt{3}x = \frac{\pi}{2}$</p>
Q9	<p>If $(\tan^{-1} x)^2 + (\cot^{-1} x)^2 = \frac{5\pi^2}{8}$, then find x</p>
Q10	<p>If $\tan^{-1} \left(\frac{1}{1+1.2} \right) + \tan^{-1} \left(\frac{1}{1+2.3} \right) \dots \tan^{-1} \left(\frac{1}{1+n(n+1)} \right) = \tan^{-1}(x)$, then find x</p>

CASE STUDY1:



Two men on either side of a temple of 30 meters high observe its top at the angles of elevation α and β respectively. (as shown in the figure above). The distance between the two men is $40\sqrt{3}$ meters and the distance between the first person A and the temple is $30\sqrt{3}$ meters. Based on the above information answer the following:

1. $\angle CAB = \alpha =$

- a. $\sin^{-1}(2\sqrt{3})$
- b. $\sin^{-1}(12)$
- c. $\sin^{-1}(2)$
- d. $\sin^{-1}(\sqrt{32})$

2. $\angle CAB = \alpha =$

- a. $\cos^{-1}(15)$
- b. $\cos^{-1}(25)$
- c. $\cos^{-1}(\sqrt{32})$
- d. $\cos^{-1}(45)$

3. $\angle BCA = \beta =$

- a. $\tan^{-1}(12)$
- b. $\tan^{-1}(2)$
- c. $\tan^{-1}(1\sqrt{3})$
- d. $\tan^{-1}(\sqrt{3})$

4. $\angle ABC =$

- a. $\pi/4$
- b. $\pi/6$
- c. $\pi/2$
- d. $\pi/3$

5. Domain and Range of $\cos^{-1}x =$

- a. $(-1, 1), (0, \pi)$
- b. $[-1, 1], (0, \pi)$
- c. $[-1, 1], [0, \pi]$
- d. $(-1, 1), [-\pi/2, \pi/2]$

Subject – Economics

- Q1. Give meaning of money supply. State its components. (2)
- Q2. Define Credit Multiplier. What role does it play in determining the credit creation power of the banking system? Use a numerical illustration to explain. (2)
- Q3. How does a central bank control the availability of credit by open market operation? (2)
- Q4. Explain the role of the Reserve Bank of India as the “lender of last resort”. (2)
- Q5. Explain ‘Banker’s Bank’ function of central bank. (3)
- Q6. Explain ‘Government’s bank’ function of central bank. (3)
- Q7. Explain central bank’s function as currency authority. (3)
- Q8. Explain the components of Legal Reserve Ratio. (3)
- Q9. Explain the role of reverse repo rate in controlling money supply. (5)
- Q10. Explain any two methods of credit control used by Central Bank. (5)

Subject – Computer Science

Q1 How many times is the following loop executed? (1)

```
i = 100
while (i<=200):
    print i
    i +=20
```

Q2 What are the logical operators of Python? (1)

Q3 Convert the following while loop into for loop: (2)

```
i = 0
while i < 100:
    if i % 2 == 0:
        print i, "is even"
    else:
        print i, "is odd"
    i = i + 1
```

Q4 What are default arguments? (2)

Q5 Differentiate between the round() and floor() functions with the help of suitable example. (2)

Q6 Out of the following, find the identifiers, which cannot be used for naming Variable or Functions in a Python program: (2)

_Cost, Price*Qty, float, switch, Address one, Delete, Number12, do

Q7 Which string method is used to implement the following: (2)

1. To count the number of characters in the string.
2. To change the first character of the string in capital letter.
3. To check whether given character is letter or a number.
4. To change lowercase to uppercase letter.
5. Change one character into another character.

Q8 What is the difference between input() and raw_input()? (2)

Q 9 Rewrite the following for loop into while loop: (2)

```
for a in range(90, 9, -9):
```

print a

Q10 Write for statement to print the series 10,20,30,, 300 (2)

Q11 How many times is the following loop executed? (2)

```
i = 100
while (i<=200):
    print i
    i +=20
```

Q13 What are the differences between arrays and lists? (2)

Q14 Carefully observe the following python code and answer the question that follows: (2)

```
x=5
def func2():
    x=3
    global x
    x=x+1
    print x
    print x
```

On execution the above code produces the following output.

6
3

Explain the output with respect to the scope of the variables.

Q15 Write a program to find all the prime numbers up to a given number (2)

Q16 What will be the output? Justify your answer. (2)

```
def cal(m,n):
    if m==n:
        return m*3
    else:
        return n*2
s = cal("Amit", "Anuj")
print(s)
```

- a. AmitAmitAmit
- b. AmitAmit
- c. AnujAnujAnuj
- d. AnujAnuj

Q17 Fill in the blank so that the output is 9: (2)

```
a = 9
def sound():
    _____ a
    print(a)
sound()
```

- a. local
- b. global
- c. outer
- d. var

Subject – Informatics Practices

- Q1. Name three data structures available in Pandas. (2)
- Q2. Write a program in Python to create series of vowels. (2)
- Q3 Write a program to create a series from dictionary that stores classes (6,7,8,9,10) as keys and number of students as values. (2)
- Q4. Write the output of the following : (2)
- ```
import pandas as pd
S1 = pd.Series(12, index = [4, 6, 8])
print(S1)
```
- Q5. Which property of series return all the index value? Support with an example. (2)
- Q6. Which property of Series help to check whether a Series is empty or not?  
Explain with example. (2)
- Q7. Write the output (2)
- ```
import pandas as pd
S1 = pd.Series([31, 28, 31, 30, 31], index = ["Jan", "Feb", "Mar", "Apr", "May"])
print(S1["Jun"])
```
- Q8. Write the output of the following : (2)
- ```
import pandas as pd
S1 = pd.Series([31, 28, 31, 30, 31], index = ["Jan", "Feb", "Mar", "Apr", "May"])
print(S1[0 : 2] * 2)
```
- Q9. Explain head and tail functions / methods of Pandas Series. (2)
- Q10. Write the output of the following code : (2)
- ```
import pandas as pd
S1 = pd.Series([2, 5, 7, 10])
S2 = pd.Series([1, 3, 5, 7])
print(S1 + S2)
```

Q11. Consider the following Series object “S1” and write the output of the following statement.

(0.5 *20 =10)

0 21

1 41

2 62

3 81

4 23

5 45

6 68

7 89

```
import pandas as pd
```

```
L1=[21, 41, 62, 81, 23, 45, 68, 89]
```

```
S1 = pd.Series(L1)
```

```
print("1. ",S1.index)
```

```
print("2. ",S1.values)
```

```
print("3. ",S1.shape)
```

```
print("4. ",S1.ndim)
```

```
print("5. ",S1.size)
```

```
print("6. ",S1.nbytes)
```

```
print("7. ",S1[0])
```

```
print("8. ",S1[2]+S1[0])
```

```
print("9. ",S1[5]**2)
```

```
print("10. ",S1.empty)
```

```
print("11.\n",S1[[1, 5, 6]])
```

```
print("12.\n",S1[5 : 7],"\n")
```

```
print("13.\n",S1[: : -1])
```

```
print("14.\n",S1>60)
```

```
print("15.\n",S1[S1>60])
```

```
print("16.\n",len(S1))
```

```
print("17.\n",S1.count())
```

```
print("18.\n",S1.head())
```

```
print("19.\n",S1.tail())
```

```
print("20.\n",S1[4:5] + S1[4:5])
```

Subject – Psychology

- Q1. Intelligence tests provide a _____ of a person's general cognitive competence including the ability to profit from schooling. (1)
- Q2. Aptitude tests are used to predict what an individual will be able to do if given proper _____ and _____. (1)
- Q3. Define intellectual deficiency. (2)
- Q4. What is Buddhi ? (2)
- Q5. State the characteristics of individuals with type A personality. (3)
- Q6. You have assessed 20 peers of your class for mathematical comprehension/ Knowledge. Create a distribution for the results you are most likely to expect. What is the shape of this distribution? (3)
- Q7. How can a faulty behaviour be modified with token economy? Elucidate with the help of an example. (4)
- Q8. The evidence for hereditary influences on intelligence comes mainly from studies of twins and adopted children. With respect to the role of environment, studies have reported that as children grow in age, their intelligence level tends to move closer to their adopted parents. Children from disadvantaged home adopted into families of higher socio-economic status exhibit in a large increase in their intelligence scores. There is evidence that environmental deprivation lowers intelligence while rich nutrition, good family background and quality schooling increases intelligence. There is a general consensus among psychologists that intelligence is the product of complex interaction of heredity and environment. Heredity can be viewed as something that sets a range within which an individual's development is shaped by the support and opportunities of the environment. Studies have also shown correlation between twins reared together (.60) and siblings reared together (.50) and sibling reared apart (.25) to share intelligence. (4)
- i. As children grows in age, their _____ tends to closer to their adoptive parents.
- a. Moral value b. Mental level c. Intelligence level d. All the above
- ii. Environmental deprivation lowers _____
- a. Insight Ness b. Intelligence c. wisdom d. None of the above

iii. The evidence for the hereditary influences on intelligence comes mainly from

a. studies of twins b. studies of adopted children c. both a & b d. neither a & nor b

iv. children from disadvantaged homes adopted into families of higher socio-economics status exhibit a large increase in their _____.

a. educational status b. intelligence scores c. social status d. All the above

Q9. Rehaan is good at solving mathematical problems. Which intelligence according to Gardener would he excel in? Write the key characteristics of multiple intelligence. (5)

Q10. How do Alfred Adler and Karen Horney Explain personality development? (5)

Subject – Physical Education

1. How many teams will be placed in IIIrd quarter if 31 teams are participating in a knock-out tournament? (1)
(a) 6 (b) 7 (c) 8 (d) None
2. Intramurals are significant for: (1)
(a) Physical development (b) Mental development
(c) Social development (d) All the above
3. Which sports competition is organised within the school? (1)
(a) Inter state (b) Extramural
(c) Intramural (d) None of these
4. Define and classify 'fixtures. Draw a league fixture for 16 teams. (5)
5. What do you mean by combination tournament? Discuss league cum knock-out and knock-out cum league with the help of examples. (5)
6. What do you mean by planning? Elucidate the objectives of planning in sports in detail. (5)
7. What is a league tournament? Draw a fixture of six teams using round robin method. (5)
8. Explain macro nutrients. (5)
9. What do you understand by non-nutritive components of diet? Explain in detail. (5)
10. Explain nutritive components of diet. (5)