St. Mary's School, Dwarka
Holiday Homework
Std. XI
Week 4
Worksheet 4

Subject: English

General Instructions: Attempt questions based on specific instructions for each section.

SECTION A- Reading

Q1. Read the following passage carefully.

1. E-learning is the process of acquiring knowledge through electronic technologies and resources. A rise in the number of internet users has increased the market demand for sophisticated online learning courses. According to the Office for National Statistics, nearly all adults in the age group of 10 to 44 years in the UK were recent internet users (99%) in 2019. The availability of enhanced network connectivity coupled with the convenience offered by on-demand courses, will drive the market size.

2. According to the World Economic Forum, around 1.2 billion children are out of classrooms with schools shut down globally due to the Covid-19 pandemic. Electronic Learning Management Systems such as Google Classrooms are helping classes to connect distantly, communicate efficiently and stay organized. Large-scale national efforts to leverage technology to the market players in support of distance education, remote, and online learning during the Covid-19 pandemic are emerging and evolving rapidly.

The virtual classroom technology in the e-learning market is expected to grow at a CAGR (Compound Annual Growth Rate) of 11% during the forecast timespan. A virtual classroom is a digital environment that enables live interaction between a tutor and a learner. Video conferencing and online whiteboards for real-time collaboration are the most common tools used in a digital teaching space. Collaborative virtual classes allow the active participation of students, creating an environment similar to a physical classroom. The technique is gaining traction with an increasing number of corporate and academic

sectors deploying it for enhanced training sessions. Multilateral organizations and world bodies, such as WHO and G20, are also deploying e-learning modes to teach healthcare professionals.

The content providers segment accounted for around 60% e-learning market share in 2019. E-learning providers share content on a varied range of topics by collaborating with domain experts that help them to develop the learning content. They focus on offering specific and customized content as per the end-user requirements.

Based on your understanding of the passage, answer the questions given below.   (1x5=5)

i)   Infer one reason for the increase in the market demand for online learning resources.

ii)   Pick the CORRECT option that shows the new technologies that will drive the market growth.

(1)   Video conferencing
(2)   Cloud computing
(3)   Online whiteboard
(4)   AI coupled with internet

(A)   2 and 3
(B)   1 and 4
(C)   2 and 4
(D)   1 and 4

iii)   Complete the following analogy correctly with a word/phrase from paragraph 3.
        God: disciple: : learner

iv)   Select the option that lists the INCORRECT statement from the ones given below:
(1)   E-learning is the process of acquiring knowledge through electronic technologies and resources.
(2)   All adults in the age group of 16 to 14 years in the UK were recent internet users (99%) in 2019.
(3)   A rise in the number of internet users has increased the market share for physical classrooms.
(4)   Content providers segment accounted for around 60% e-learning share in 2019.
(A) 3
(B) 4 and 2
(C) 2 and 1
(D) 1

v)   The study of virtual classroom technology in the e-learning market showed 11% (CAGR)
        …………growth during the forecast timespan.
A. expected
B. consistent
C. inconsistent
D. questionable

SECTION B--Literature

Q2. Read the extract given below and answer the questions that follow:-   (2)

All three stood still to smile through their hair

At the uncle with the camera. A sweet face,

My mother's, that was before I was born.

And the sea, which appears to have changed less,

Washed their terribly transient feet.

  (i) What/Who does 'three' refer to?

  (ii) Bring out the comparison between the sea and the 'feet'.

Answer the following question in 20 to 30 words.   **(2)**

Q3. How did the birds mourn the grandmother's death?

Answer the following questions in 60 to 80 words.   **(3x2=6)**

Q4 Why did the narrator wait for so long to visit Mrs. Dorling? Why did she become curious about the possessions of her mother?

Q5. Compare and contrast the characters of Mourad and Aram.

SECTION C--Grammar

Q6. Fill in the blank by choosing the correct option to complete it.   **(1)**

Mathematics …… my favourite subject.

  A. is

  B. are

  C. was

  D. had

  Q7. Select the correct option to fill in the blank for the given line. Ram …… keep his word.

  A. might

  B. should

  C. will

  D. ought to

SECTION D--Writing

Q8. National Book Trust of India is organizing a Summer Camp 'Fiesta 2023' for students aged 5 to 16 years from 17th June to 22nd June 2023 in Jawahar Lal Nehru Stadium. Design an attractive poster with catchy slogans highlighting the special attractions**.**   **(2)**

Q9. Advertisements play a pivotal role in shaping the ideas of the youth. Write an article in about 150 words about the impact advertisements have on young children in schools and colleges.   **(4)**

Q10. Watch the movies listed below:-
- **Schindler's List**
- **Life of Pi**
- **Everything Everywhere All at Once**
- **Gravity**
- **Interstellar**

Write the synopsis of any one of them in about 120 to 150 words. **(2)**

Subject: Physics

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

1. Under what condition does the equality: $\left|\vec{a} + \vec{b}\right| = \left|\vec{a} - \vec{b}\right|$ hold good?　　　　1

2. The resultant of two vectors $\vec{P}$ and $\vec{Q}$ is perpendicular to $\vec{P}$ and its magnitude is half that of $\vec{Q}$. What is the angle between $\vec{P}$ and $\vec{Q}$?　　　　1

3. A body is projected horizontally from the top of a cliff with a velocity of 20 m/s . What time elapses before horizontal and vertical velocities become equal?　　　　2

4. Prove that the horizontal range us same when angle of projection is (i) greater than 45º by certain value and (ii) less than 45º by the same value.　　　　2

5. State parallelogram law of vector addition. Show that resultant of two vectors $\vec{P}$ and $\vec{Q}$ inclined at an angle θ is R = $\sqrt{P^2 + Q^2 + 2PQCos\theta}$　　　　2

6. (a) What will be the projection of vector $\vec{A} = \hat{\imath} + \hat{\jmath} + \hat{k}$ on vector $\vec{B} = \hat{\imath} + \hat{\jmath}$?　　　　3

(b) Determine the angle which the vector $\vec{A} = 5\hat{\imath} + 0\hat{\jmath} + 5\hat{k}$ makes with X, Y and Z- axes.

7. (a) If vectors $\vec{P}, \vec{Q}$ and $\vec{R}$ have magnitude 5,12 and 13 units and $\vec{P} + \vec{Q} = \vec{R}$, find the angle between $\vec{Q}$ and $\vec{R}$.

(b) If $\vec{A} + \vec{B} = \vec{C}$ and A^2 +B^2 =C^2 then prove that $\vec{A}$ and $\vec{B}$ are perpendicular to each other.　　　　3

8. (a) If unit vectors $\hat{a}$ and $\hat{b}$ are inclined at angle θ then prove that

$$\left|\hat{a} - \hat{b}\right| = 2 \sin\frac{\theta}{2}$$

(b) Calculate the area of the parallelogram whose two adjacent sides are formed by the vectors $\vec{A} = 3\hat{\imath} + \hat{\jmath} + 4\hat{k}$ and $\vec{B} = \hat{\imath} - \hat{\jmath} + \hat{K}$　　　　3

9. Two parallel rail tracks run north south. Train A moves with a speed of 54 Kmh^{-1} and train B moves south with a speed of 90Kmh^{-1}. What is the

(i) relative velocity of B with respect to A.

(ii) relative velocity of ground with respect to B ?

(iii) velocity of a monkey running on the roof of the train A against its motion (with a velocity of 18Kmh^{-1} with respect to the train A) as observed by a man standing on the ground?   3

10. A basketball player throws a ball with an initial velocity of 6.5 m/s at an angle of 50° to the horizontal. The ball is 2.3 m above the ground when released.   5

The ball travels a horizontal distance of 2.9 m to reach the top of the basket. The effects of air resistance can be ignored.
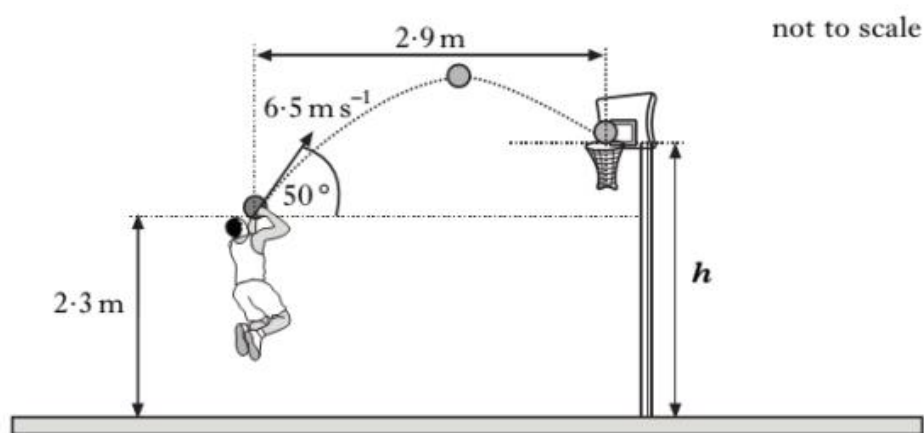
(a) Calculate: (i) the vertical component of the initial velocity of the ball.

         (ii) the horizontal component of the initial velocity of the ball.

(b) Show that the time taken for the ball to reach the basket is 0.69s.

(c) Calculate the height h of the top of the basket.

(d) A student observing the player make the following statement.

"The player should throw the ball with a higher speed at the same angle. The ball would then land in the basket as before but it would take a shorter time to travel the 2.9 metres."

Explain why the student's statement is incorrect.

Subject: Chemistry

Q 1: Define stoichiometry and explain its importance in chemical calculations.   2

Q 2: Calculate the number of atoms in 2 moles of sodium (Na).   2

Q 3: What is the mass of 0.5 moles of carbon dioxide (CO_2)?   2

Q 4: State Dalton's atomic theory.   2

Q 5: What is the percentage yield of a reaction if the actual yield is 8 grams and the theoretical yield is 10 grams?   2

Q 6: Explain the concept of limiting reactant with an example.   3

Q 7: Calculate the empirical formula of a compound containing 12 grams of carbon and 16 grams of oxygen.   3

Q 8: What is the concept of equivalent weight in a redox reaction?   3

Q 9: Calculate the volume of 1 mole of a gas at STP.   3

Q10: Define concentration and explain how it is expressed in terms of molarity.   3

Subject: Mathematics

Q.1) Find the number of non-zero integral solutions of the equation $|1 - i|^x = 2^x$ (2)

Q.2) Prove that $\sin x + \sin 3x + \sin 5x + \sin 7x = 4 \cos x \cos 2x \sin 4x$.   (2)

Q.3) Find $\sin \frac{x}{2}$, $\cos \frac{x}{2}$ and $\tan \frac{x}{2}$ if $\sin x = ¼$ and x lies in quadrant II.   (2)

Q.4) Draw appropriate venn diagram for each of the following: (2)

(i) $A^c \cup B^c$ (ii) $(A \cup B)^c$

Q.5) Find sets A, B and C such that $A \cap B$, $B \cap C$ and $A \cap C$ are non-empty and $A \cap B \cap C = \varphi$.

     (2)

Q.6) Prove that: $\cos 2x \cos \frac{x}{2} - \cos 3x \cos \frac{9x}{2} = \sin 5x \sin \frac{5x}{2}$.   (3)

Q.7) Show that $\tan 3x \tan 2x \tan x = \tan 3x - \tan 2x - \tan x$ (3)

Q.8) Find the value of : (i) $\tan 15°$ (ii) $\tan \frac{13\pi}{12}$.   (3)

Q.9) If $\cos(\alpha + \beta) = 4/5$ and $\sin(\alpha - \beta) = 5/13$ where α lies between 0 and $\pi/4$, find the value of $\tan 2\alpha$.   (3)

[Hint : Write $\tan 2\alpha$ *as* $\tan(\alpha + \beta + \alpha - \beta)$

Q.10) Find the general solution of the trigonometric equation:

$\tan x + \tan 2x + \sqrt{3} \tan x \tan 2x = \sqrt{3}$.   (3)

Subject: Computer Science and Informatics Practices

Q1. The variable definition of X is creating problem X = 0281.Why.   2

Q2. Two objects (say a and b) when compared using ==, return True. But Python gives False when compared using is operator. Why (i.e, a == b is True but why is a is b False?)   2

Q3. Write the expression in Python for the following: 2+2

   a) $a^2 + b^2 = c^2$ b) $x = \frac{-b+\sqrt{b^2-4ac}}{2a}$

Q4 Explain the following Python software libraries: 2x3=6

a) NumPy b) SciPy c) Panda Library

Q5 What are core data types in Python? Explain.   3

Q6 What are the ways to write comments in Python?   2

Q7 Predict the output: 3

        a,b,c=2,3,4

a,b,c=a*a,b*b,c*c

a,b,c=a//2,b//3,c//4

a,b,c=a%2,b%2,c%2

print(a,b,c)

print(a,b,c)

print(a,b,c)

Q8 Given three Boolean variables a, b, c as : a= False , b = True , c = False. Evaluate the

following Boolean expressions: 3

(a) b and c   (b) b or c   (c) not a and b   (d) (a and b)or not c   (e) not b and not (a or c)

(f) not ((not b or not a)and c)or a

Q9 Write Python programs to do the following: 2x3=6

   a) to do arithmetical operations
   b) to find area of a circle
   c) to display your name a number of times.

Q10 Draw a flowchart to check if a number is a positive or negative number.   2

Subject: Biology

Q1.   Give the floral diagram of solanum nigrum (makoi) plant.   (2)

Q2.   Name two plants of Fabaceae for each of the following:

(a) That yield edible oil and
(b) That yield fodder.   (2)

Q3.   Differentiate between the androecium of Fabaceae and Solanaceae.   (2)

Q4.   Mention any four symptoms of viral diseases in plants.   (2)

Q5.   What do the terms phycobiont and mycobiont signify?   (3)

Q6.   Describe briefly the four major groups of Protozoa.   (3)

Q7.   How is a key helpful in identification and classification of an organism?   (3)

Q8.   Mention any four economic uses of Ascomycetes.   (3)

Q9.   Describe the various types of placentation found in flowering plants.   (5)

Q10.   Justify the following statements on the basis of external features:

(a) Underground parts of a plant are not always roots.
(b) Flower is a modified shoot.   (2.5+2.5 = 5)

Subject: Economics

Q1. What does the problem for whom to produce refer to?   2

Q2. What is the opportunity cost? Explain with the help of a numerical example.   2

Q3. Why is a Production Possibility Curve (PPC) concave? Explain.   2

Q4. What is the production possibility frontier?   2

Q5. Draw a production possibility curve and mark the following situations.   2

a. Underutilization of resources

b. Full employment of resources

c. Growth of resources

Q6. Explain the central problem of the choice of products to be produced.   3

Q7. What is the difference between the planned economy and market economy?   3

Q8. Does massive unemployment shift the PPC to the left?   3

Q9. Define Normative Economics with a suitable example.   3

Q10. Write a short note on marginal rate of transformation.   3

Subject: Psychology

Q1. Case studies are fruitful in investigating unusual assumption or unusual individuals.   1

Q2. _____ and _____ are two types of tests based on language.   1

Q3. Distinguish between the speed test and power test.   2

Q4. Give the steps of scientific methods.   2

Q5. What are the two distinctive methods of an experimental research.   2

Q6. Give any four goals of psychological enquiry.   2

Q7. Give difference between quasi experiment and field experiment.   3

Q8. Explain the main feature of interview method.   4

Q9. Describe limitations of psychological enquiry.   4

Q10 What is correlation method?   4