



# **S.B.P. D.A.V. Centenary Public School, Fatehabad.**

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## **Assignments for Summer Vacations (2025-26) for Class XI NON-MEDICAL**



### **General Instructions:**

1. *Get up early in the morning and go out for a walk daily. Do yoga daily for healthy living.*
2. *Make a Bird feeder and add seeds for birds daily and also place water for them.*
3. *Raise a small kitchen garden by planting seeds.*
4. *Learn any one folk song.*
5. *Help your mother in cooking and learn vegetable cooking and salad decoration.*
6. *The summer break for classes VI-XII will be from 01.06.2025 to 01.07.2025 (Both days inclusive). School will reopen on 02.07.2025.*
7. *Revise the syllabus of all subjects done before summer vacations for Unit Tests to be started from 07.07.2025.*
8. *Try to make your handwriting better by practicing and do your HW in good handwriting.*
9. *Do assignments in holidays homework notebook and activities/projects on A4 sheets for each subject & submit it for assessment to your class teacher on July 10, 2025.*
10. *Learn all the prayers and mantras given in student diary.*
11. ***Register & participate in 1<sup>st</sup> stage of 11<sup>th</sup> Online International Humanity Olympiad, International Open Oratory Contest and International Open Poetry Recitation Contest by accessing through web portal <https://www.dhyankaksh.org/value-your-virtues>. Every individual passing the exam (i.e. scoring minimum 40%) will get an e-certificate through e-mail immediately on their e-mails. School code is : FATE104. This certificate and certificates of courses earned by you during holidays should be part of your portfolio.***
12. ***Waste Warriors: Smart Sorting & Creative Recycling.** Survey at least 10 families in your surroundings and collect data how they Dispose off two types of waste and create awareness in them to segregate waste. Click pictures and paste in your portfolio.*

### **ENGLISH**

**Revise the following syllabus for Unit Test-**

**Reading Section-**Unseen passages for comprehension

**Grammar:**Tenses,Prepositions

**Writing Section-** Advertisements

## **Hornbill :**

- 1-The Portrait Of A Lady
  - 2.We're Not Afraid to Die if We Can All be Together
- A Photograph(Poem)

## **Snapshot:**

- 1.The Summer of The Beautiful White Horse
- 2.The Address

## **Solve the following worksheets in BBC Compacta in neat and clean handwriting (Use pencil only)**

- 1.Worksheet 1 to 5(Reading Comprehensions)
- 2.Do worksheets of Tenses,Preposition
3. Advertisement Writing- Any five according to prescribed syllabus(Unsolved)
4. Solve extracts of all the lessons and poems included in Unit Test (as mentioned above)

1. Read the lesson 'The Portrait of a Lady 'by Khushwant Singh. Relating to the topic, share your thoughts on how each family member contributes to a happy family. Discuss the roles of the father, mother, and children in maintaining family harmony.

2.After reading the story (We're not Afraid to Die if we can all.....)Develop a storyboard illustrating the key events of the story, such as the onset of the storm, the family's efforts to save the boat, and their eventual rescue.This visual representation will help in understanding the sequence of events and the challenges faced.

3.Create a podcast max 3 minutes/documentary/standup comedy/a short commercial (audio or visual) addressing any social issue/stereotype/superstition.

4.Watch Ted talks related to the Elderly,People with disabilities and Environment and express your opinion on the same in about 100 words each.

## **Project work- As assigned in the class.**

## **PHYSICS**

- Revise chapters (1) Units and Measurements (2) Motion in a Straight Line and (3) Motion in a Plane for UT.
- Complete all NCERT examples, problems and NCERT exemplar questions and answers of chapters 1,2,3 in holidays homework notebook.
- Complete practical file of all the assigned experiments and activities.

- Make a video of demonstrating any 2 activities of physics from the syllabus.
- Complete physics worksheet provided in the end in holidays homework notebook.
- Complete all MCQ's of completed chapters from Booklet provided in school.

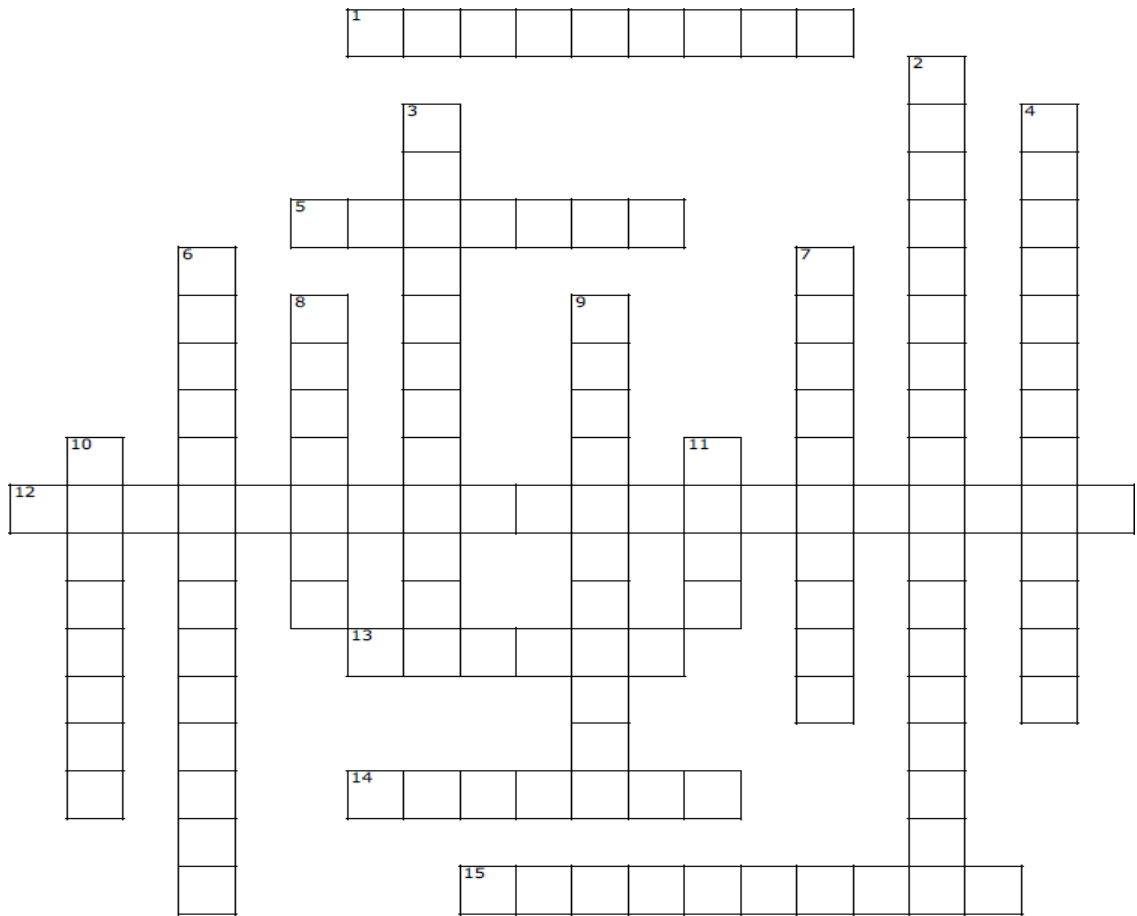
## CHEMISTRY

- **REVISE syllabus for U.T**
- **Do work in separate note book wherever not mentioned (thin one).**
  1. Study the inventions of last two years (2023, 2024) Nobel Laureates of Chemistry and Summarize their work in your own words.
  2. Investigatory Project Report to be made on the topics allotted in class. Follow the given headings in the project:
 

a) INTRODUCTORY PAGE	b) CERTIFICATE
c) ACKNOWLEDGEMENT	d) INDEX/CONTENTS
e) INTRODUCTION	f) AIM
g) CHEMICALS REQUIRED	h) PROCEDURE/EXPERIMENT
(S) i) OBSERVATIONS	j) RESULT
k) CONCLUSION	l) BIBLIOGRAPHY

Learn and draw **well labeled** complete **periodic table**.

## Solve



### Across

1. Plays in radioactive atoms that changes a neutron to a proton or electron.
5. An atom that has the same number of protons/atomic number as other atoms of the same element do but that has a different number of neutrons/atomic mass.
12. A type of physical that occurs between electrically charged particles.
13. A subatomic particle that has a positive charge and that is found in the nucleus of an atom.
14. An atom's central region, which is made up of protons and neutrons.
15. The sum of the number of protons and neutrons in the nucleus of an atom.

### Down

2. A force that attracts any objects with mass.
3. The number of protons in the nucleus of an atom; the atom's number is the same for all atoms of an element.
4. A region around the nucleus of an atom whose electrons are likely to be found.
6. A unit of mass that describes the mass of an atom or molecule.
7. The mass of an atom expressed in atomic mass units.
8. A subatomic particle that has no charge and that is found in the nucleus of an atom.
9. The force that holds particles together in the atomic nucleus.
10. A subatomic particle that has a negative charge.
11. The smallest unit of an element that maintains the properties of that element.

1. Two students performed the same experiment separately and each one of them recorded two readings of mass which are given below. Correct reading of mass is 3.0 g. On the basis of given data, mark the correct option out of the following statements.

Student	Reading 1	Reading 2
A	3.01	2.99
B	3.05	2.95

- (a) Results of both the students are neither accurate nor precise.  
(b) Results of student A are both precise and accurate.  
(c) Results of student B are precise but not accurate.  
(d) Results of student B are both precise and accurate.
2. What is the mass per cent of carbon in carbon dioxide?  
(a) 0.034%                      (b) 27.27%                      (c) 3.4%                      (d) 28.7%
3. If 500 mL of a 5 M solution is diluted to 1500 mL, what will be the molarity of the solution Obtained?  
(a) 1.5 M                      (b) 1.6 M                      (c) 0.017 M                      (d) 1.59 M
4. The number of atoms present in one mole of an element is equal to Avogadro number. Which of the following elements contains the greatest number of atoms?  
(a) 4g He                      (b) 46g Na                      (c) 0.40 g Ca                      (d) 12 g He
5. 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
6. What will be the molality of the solution containing 18.25 g of HCl gas in 500 g of water?  
(a) 0.1 m                      (b) 1 M                      (c) 0.5 m                      (d) 1 m
7. **Assertion (A)** : Significant figures for 0.200 is 3 whereas for 200 it is  
**Reason (R)** : Zero at the end or right of a number are significant provided they are not on the right side of the decimal point.
- (i) Both A and R are true and R is correct explanation of A.  
(ii) Both A and R are true but R is not a correct explanation of A  
(iii) A is true but R is false.  
(iv) Both A and R are false.
8. **Assertion (A)** : Combustion of 16 g of methane gives 18 g of water.  
**Reason (R)** : In the combustion of methane, water is one of the products.

- (i) Both A and R are true but R is not the correct explanation of A.
- (ii) A is true but R is false.
- (iii) A is false but R is true.
- (iv) Both A and R are false.

**9. Assertion (A) :** All isotopes of a given element show the same type of chemical behaviour.

**Reason (R) :** The chemical properties of an atom are controlled by the number of electrons in the atom.

- i) Both A and R are true but R is not the correct explanation of A.
- ii) A is true but R is false.
- iii) A is false but R is true.
- iv) Both A and R are false.

**10. Assertion (A) :** Black body is an ideal body that emits and absorbs radiations of all frequencies.

**Reason (R) :** The frequency of radiation emitted by a body goes from a lower frequency to higher frequency with an increase in temperature.

- i) Both A and R are true but R is not the correct explanation of A.
- ii) A is true but R is false.
- iii) A is false but R is true.
- iv) Both A and R are false.

**11. Assertion (A) :** It is impossible to determine the exact position and exact momentum of an electron simultaneously.

**Reason (R) :** The path of an electron in an atom is clearly defined.

- i) Both A and R are true but R is not the correct explanation of A.
- ii) A is true but R is false.
- iii) A is false but R is true.
- iv) Both A and R are false

**12.** Determine the molecular formula of an oxide of iron if the mass % of iron and oxygen are 69.9% and 30.1% resp. Molar mass of compound is 170 gm/mol.

**13.** The density of 3 M solution of NaCl is 1.25gm/ml. Calculate the molality of the solution.

**14.** 10 L of a welding gas weighs 11.6 gm at STP. Calculate the molar mass of this gas.

**15.** Calculate the number of atoms in (a) 5 L oxygen gas at STP (b) 4.4 gm of CO<sub>2</sub>(c) 52 a.mu of He

16. Calculate the number of moles in (a) 5 L of 0.75 M  $\text{Na}_2\text{CO}_3$  (b) 7.85 gm iron (c) 34.2 gm of sucrose
17. A compound contains 4.07% hydrogen, 24.27% carbon and rest chlorine. Its molar mass is 98.96 gm. Determine its empirical and molecular formula.
18. What are the main points and limitations of Dalton's atomic theory?
19. 50 kg of  $\text{N}_2$  and 10 kg of hydrogen gas are mixed to produce ammonia gas. Calculate mass of ammonia gas formed. Identify limiting reagent in the production of  $\text{NH}_3$  in this solution.
20. 3.0 g of  $\text{H}_2$  react with 29.0 g  $\text{O}_2$  to yield  $\text{H}_2\text{O}$ .
- What is the limiting reactant?
  - Calculate the maximum amount of water that can be formed.
  - Calculate the amount of one of the reactants which remains unreacted.
21. Chlorine has two isotopes of atomic mass units 34.97u and 36.97u .the relative abundances of these two isotopes are 0.735 and 0.245 respectively. Find out average atomic mass of chlorine.
22. Prepare at least two conversions for each:
- $\text{m}^3$  to litre
  - $\text{m}^3$  to  $\text{cm}^3$
  - atm to barr
  - Kelvin to  $^\circ\text{F}$
  - $\text{cm}^2$  to  $\text{nm}^2$
23. A metal forms two oxides. One contains 46.67% of the metal and another 63.94% of the metal. Show that these results are in accordance with law of multiple proportions.
24. An organic liquid having Carbon , hydrogen, oxygen and nitrogen contains C=41.37%, H=5.75%, N=16.09% and rest is oxygen. Calculate the molecular formula of liquid if its V.D. is 43.
25. Define black body and black body radiations.
26. Write the electronic configuration of Cu and Cr.
27. An ion with mass number 56 contains 3 units of positive charge and 30.4% more neutrons than electrons .assign symbol to the ions.
28. Show that the circumference of the Bohr orbit for the hydrogen atom is integral multiple of the de Broglie wavelength associated with the electron revolving around the orbit.
29. What is the lowest value of n which allows 'g ' orbital to exist.
30. What transition in a hydrogen spectrum would have the same wavelength as in the Balmer transition  $n = 4$  to  $n = 2$  of  $\text{He}^+$  spectrum?
31. Write postulates of Bohr's model of atom
32. Write postulates of Bohr's model of atom.
33. Define Heisenberg's uncertainty principle.

34. Difference between orbit and orbital.
35. Explain Aufbau's principle
36. Write complete electronic configuration of elements from 1 to 40.
37. What is ionization energy? How it varies from left to right and top to bottom in a periodic table?
38. What is electronegativity? Arrange the given elements in increasing order of electronegativity: Nitrogen, Oxygen, Carbon, Hydrogen, Bromine, Chlorine, Fluorine, Sulphur, phosphorus, Iodine
39. Why atomic masses are the average values? Explain by giving example.
40. Why is molality preferred over molarity in expressing concentration of solution?
41. In combustion of methane, which is limiting reagent and why?
42. A sample of gaseous substance weighing 0.5 g occupies a volume 1.12 litres under N.T.P conditions. Calculate the molar mass of the substance.
43. In Rutherford's experiment, generally thin foils of heavy atoms like gold, platinum etc. is used in bombardment of alpha particles. If thin films of light atoms like aluminium etc. are used, what difference would be observed?
44. Define Quantum numbers. Show that how different quantum numbers are related with each other.
45. State and explain de- Broglie relation.
46. How many no. of nodes are present in 3P orbital?
47. Why Heisenberg uncertainty principle has no significance in our daily life?
48. Complete the practical file and do all the NCERT questions of above chapter.

### Elective Maths

#### Sets

1. Let  $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$ ,  $A = \{1, 2, 3, 4, 5\}$ ,  $B = \{2, 4, 6, 8, 9, 10\}$  and  $C = \{4, 7, 9, 10\}$ . Then

[i] The value of  $A' \cap (B - C)$  is

- [a]  $\{5, 6, 7, 8, 9\}$                       [b]  $\{7, 9, 10\}$                       [c]  $\{7, 8, 9, 10\}$                       [d]  $\{4, 6, 7, 8, 9\}$

[ii] The value of  $(B - C)'$

- [a]  $\{2, 3, 4, 5, 6, 9, 10\}$                       [b]  $\{2, 3, 4, 5, 6, 7, 9\}$                       [c]  $\{1, 3, 4, 5, 7, 9, 10\}$                       [d]  $\{2, 3, 4, 5, 7, 9, 10\}$

2. Let  $A = \{4, 5, 8, 12\}$ ,  $B = \{1, 4, 6, 9\}$ ,  $C = \{1, 2, 3, 4\}$ , then  $A - (B - C)$  is

- [a]  $\{1, 4, 8, 12\}$                       [b]  $\{4, 5, 8, 12\}$                       [c]  $\{2, 4, 5, 12\}$                       [d]  $\{3, 4, 5, 12\}$

3. If  $A = \{x : x \in \mathbb{N}, x \leq 6\}$  and  $B = \{x : x \in \mathbb{N}, 2 < x^2 < 26\}$ , then  $A \cap B$  is equal to :

- [a]  $\{3, 4, 5, 6\}$                       [b]  $\{3, 4, 5\}$                       [c]  $\{2, 3, 4, 5\}$                       [d]  $\{4, 5, 6, 7\}$

4. The set builder form of  $A = \{2,7,12,17,22\}$

[a]  $A = \{5n-3, n \in \mathbb{N}, n \leq 5\}$

[b]  $A = \{27-5n, n \in \mathbb{N}, n < 5\}$

[c]  $A = \{5n-3, n \in \mathbb{N}, n < 5\}$

[d]  $A = \{27-5n, n \in \mathbb{N}, n \geq 5\}$

5. The set builder form of  $A = \{-12, -7, -2, 3, 8, 13\}$

[a]  $A = \{5n-17, n \in \mathbb{N}, n \leq 6\}$

[b]  $A = \{17-5n, n \in \mathbb{N}, n < 6\}$

[c]  $A = \{18-5n, n \in \mathbb{N}, n < 6\}$

[d]  $A = \{18-5n, n \in \mathbb{N}, n \geq 6\}$

6. In a class of 50 students, 30 students like Maths, 25 like Bio and 16 like both Maths and Bio. Find the

number of students who like neither Maths nor Bio.

[a] 12

[b] 10

[c] 11

[d] 13

7. Let  $A = \{2,3,4,5,7,8\}$ ,  $B = \{4,5,6,7,8\}$  and  $C = \{1,3,5,6,7,8,9\}$ , then  $\{(A \cap C) \cup B\}$  equals to

[a]  $\{3,4,5,6,7,8,9\}$

[b]  $\{3,4,5,6,7,8\}$

[c]  $\{2,3,4,5,6,7\}$

[d]  $\{3,4,6,7,8,9\}$

8. Let  $U = \{1,2,3,4,5,6,7,8\}$ ,  $A = \{1,2,3,5,6\}$ ,  $B = \{2,3,4,7,8\}$  then the value of  $(A' \cup B)$  is equal to

[a]  $\{1,2,3,4,5\}$

[b]  $\{2,3,4,7,8\}$

[c]  $\{1,2,4,7,8\}$

[d]  $\{2,3,5,6,8\}$

9. If  $A = \{2,3,4,5,6\}$ , then the number of proper subsets of A is :

[a] 120

[b] 30

[c] 31

[d] 32

10. In a school, there are 20 teachers who teach Mathematics or Physics. Of these 12 teachers teach Mathematics and 4 teach Mathematics and Physics. How many teach Physics?

[a] 10

[b] 11

[c] 8

[d] 12

[a] A is false and R is true.

[b] A is true and R is false.

[c] Both A and R are true and R is the correct explanation of A.

[d] Both A and R are true but R is not the correct explanation of A.

9. Assertion : the number of non-empty subsets of the set  $\{a,b,c,d,e,f\}$  is 63.

Reason : The number of proper subsets of the set A when  $n(A) = 2^k - 1$ .

10. Assertion : The collection of ten most talented writers of India form a set.

Reason : A set is a collection of well defined of distinct objects.

## Relations & Functions

1. If  $(4x - 7, 2y + 5) = (9, 15)$  then the value of  $(2x + y)$  is

- [a] 10                      [b] 8                      [c] 13                      [d] 11

2. Find the domain of :  $f(x) = \frac{3x}{x^2 - 4x - 12}$

- [a]  $\{-2, 6\}$                       [b]  $\mathbb{R} - \{-2, 6\}$                       [c]  $\mathbb{R} - (-2, 6)$                       [d]  $\mathbb{R} - \{-2, 6\}$

3. If  $f(x) = 3x^2 - 7x - 8$ , then the value of  $f(4)$  is

- [a] 47                      [b] 46                      [c] 5                      [d] 12

4. The value of  $a$  and  $b$  if  $(3a, 4)$  and  $(2b, -1)$  belong to the set  $\{(x, y) : x - 5y = 13\}$

- [a]  $a = 11, b = 4$                       [b]  $a = 5, b = 11$                       [c]  $a = 11, b = 5$                       [d]  $a = 4, b = 11$

5. Let  $A = \{2, 3, 8\}$ ,  $B = \{2, 3, 5\}$ ,  $C = \{2, 5, 8, 9\}$  then  $(A - B) \times (B - C)$  is

- [a]  $\{(1, 2), (1, 5), (2, 5)\}$                       [b]  $\{(1, 4)\}$                       [c]  $\{(4, 5)\}$                       [d]  $\{8, 3\}$

6. Find the range of :  $y = \frac{2x + 3}{3x + 4}$

- [a]  $\mathbb{R} - \{-3/2\}$                       [b]  $\mathbb{R} - \{2/3\}$                       [c]  $\mathbb{R} - \{-2/3\}$                       [d]  $\mathbb{R} - \{3/2\}$

7. Find the domain of :  $f(x) = \frac{x^2 - x - 3}{2x^2 + 11x + 9}$

- [a]  $\{1, 9/2\}$                       [b]  $\mathbb{R} - \{-9/2\}$                       [c]  $\mathbb{R} - \{-1, -9/2\}$                       [d]  $\mathbb{R} - \{-9/2, 1\}$

8. Let  $A = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$ . Define a relation  $R$  from  $A$  to  $A$  by  $R = \{(x, y) : y = 2x + 1\}$ . The range of  $R$  is

- [a]  $\{1, 2, 3, 4, 5, 6, 7, 8, 9\}$                       [b]  $\{1, 2, 3, 4, 5\}$   
[c]  $\{3, 4, 5, 6, 7, 8\}$                       [d]  $\{3, 5, 7, 9, 11\}$

9. Let  $A = \{x : x \in \mathbb{W}, x < 2\}$ ,  $B = \{x : x \in \mathbb{N}, 1 < x < 5\}$  and  $C = \{3, 5\}$ , then  $[A \times (B \cap C)]$

- [a]  $\{(0, 3), (1, 3)\}$                       [b]  $\{(0, 3), (1, 3), (3, 3)\}$                       [c]  $\{(1, 3), (3, 3)\}$                       [d]  $\{(0, 3), (3, 3)\}$

10. Let  $A = \{2, 4, 6, 9\}$ ,  $B = \{4, 6, 18, 27, 54\}$  and a relation  $R$  from  $A$  to  $B$  is defined by

$R = \{(a, b) : a \in A, b \in B,$

$a$  is the factor of  $B$  and  $a$  less than  $b\}$ . Then domain of  $R$  is

- [a]  $\{2, 4, 6\}$                       [b]  $\{2, 6, 9\}$                       [c]  $\{4, 6, 9\}$                       [d]  $\{2, 4, 6, 9\}$

[a]  $A$  is false and  $R$  is true.

[b]  $A$  is true and  $R$  is false.

[c] Both  $A$  and  $R$  are true and  $R$  is the correct explanation of  $A$ .

[d] Both  $A$  and  $R$  are true but  $R$  is not the correct explanation of  $A$ .

1. Assertion : If  $(2x + 1, x + 5y - 2) = (9, 18)$ , then  $x = 5$  and  $y = 3$ .

Reason : Two ordered pairs are equal if their corresponding elements are equal.

2. Assertion : A relation  $R = \{(1,3),(2,2),(3,1)\}$  defined on the set  $A = \{1,2,3\}$  is a function.

Reason : A relation from set A to set B is a function if every element of A is related to a unique element of B.

### Complex Numbers

1. If  $x=3+2i$  and  $y=3-2i$ , find the value of  $5(x^2+y^2)+7(x+y)+8xy$ .

- [a] 196                      [b] 225                                      [c] 265                                      [d] 256

2. If  $(5x - 8) - (7y+2)i = 17 - 44i$ , then the value of  $x + y$  :

- [a] 11                      [b] 4                                      [c] -4                                      [d] 8

3. The value of  $(4i^6 + 14i^{11} + 14i^{12} + 16i^{17})$

- [a]  $10 + 6i$                       [b]  $10 - 6i$                                       [c]  $10 + 2i$                                       [d]  $10 - 2i$

4. The value of  $(2+8i) / (1+i)$

- [a]  $(3+4i)$                       [b]  $(5+3i)$                                       [c]  $(5-6i)$                                       [d]  $(3-2i)$

5. The number  $\frac{(1+i)^3}{1-i^5}$  is equal to :

- [a]  $i$                                       [b]  $-i$                                       [c]  $-1$                                       [d]  $-2$

6. If  $x - iy = \frac{(1+3i)^2}{2+i}$ , then the value  $(x + y)$  are :

- [a] 2                                      [b] -2                                      [c] 6                                      [d] -6

7. If  $x + iy = \frac{(2+i)(1-3i)}{(1+2i)(3+i)}$ , then the value of  $x$  and  $y$  :

- [a]  $x=3/5, y=4/5$                       [b]  $y=-3/5, x=-4/5$                                       [c]  $x=-3/5, y=-4/5$                                       [d]  $y=3/5, x=4/5$

8. If  $(4x + 1) + (6y-8)i = (-7-2i)^2$  then the value of  $x$  and  $y$  :

- [a]  $x = 11, y = -6$                       [b]  $x=11, y = 6$                                       [c]  $x=-11, y=6$                                       [d]  $x=-11, y = -6$

[a] A is false and R is true.

[b] A is true and R is false.

[c] Both A and R are true and R is the correct explanation of A.

[d] Both A and R are true but R is not the correct explanation of A.

9. Assertion : If  $4x + i(3x+4y) = 15 + 11i$ , then  $x=15/4$  and  $y = 1/16$ .

Reason : Two complex numbers are equal if their corresponding real and imaginary parts are equal.

10. Assertion : If  $Z = \frac{1}{5+12i}$ , then  $|Z| = \frac{1}{17}$

Reason : If  $Z=a+ib$  then  $|Z| = \sqrt{a^2 + b^2}$

## Trigonometry

1. The value of  $\tan(25\pi/3)$

- [a]  $\sqrt{3}$       [b]  $-\sqrt{3}$       [c]  $1/\sqrt{3}$       [d]  $-1/\sqrt{3}$

2. The value of  $\sin 120^\circ + \cos 210^\circ$

- [a] 1      [b] 0      [c] 2      [d] -2

3. If  $\cos A = 4/5$ ,  $0 < A < \frac{\pi}{2}$ , and  $\sin B = -5/13$ ,  $\pi < B < \frac{3\pi}{2}$ , then the value of  $\cos(A-B)$

- [a]  $33/65$       [b]  $-33/65$       [c]  $-63/65$       [d]  $63/65$

4. If  $x = \sec A - \tan A$  and  $y = \operatorname{cosec} A + \cot A$ , then the value of  $x - y + 1 + xy$  is

- [a] 2      [b] 0      [c] 1      [d] -1

5. If  $\cos(a+b) = 4/5$ , and  $\sin(a-b) = 5/13$ , then the value of  $\tan(2a)$  is

- [a]  $24/25$       [b]  $33/56$       [c]  $56/33$       [d]  $25/24$

6. If  $\sin A = 1/2$ , then the value of  $\sin 3A$  is :

- [a]  $1/2$       [b]  $1/3$       [c] 0      [d] 1

7. The value of  $\cos 68^\circ + \cos 52^\circ - \cos 8^\circ$  is :

- [a] 2      [b] 3      [c] 0      [d] 1

8. If  $\cos(A-B) = 3 \cos(A+B)$ , then  $\cot A \cdot \cot B$  is equal to

- [a] 1      [b] 2      [c] 3      [d] -2

9. If  $\cos A = -20/29$ , A lies in second quadrant, then the value of  $(1 + \operatorname{cosec} A)$

- [a]  $49/20$       [b]  $-5/2$       [c]  $50/21$       [d]  $-50/21$

10. If  $\sin A = -5/13$ , A lies in 4th quadrant, then the value of  $(\sec A - \tan A)$

- [a]  $18/5$       [b]  $17/5$       [c]  $3/2$       [d]  $-3/2$

11. If A lies in II quadrant and  $3 \tan A + 4 = 0$ , then the value of  $(2 \cot A - 5 \cos A + \sin A)$  is

- [a]  $-53/10$       [b]  $-7/10$       [c]  $7/10$       [d]  $23/10$

12. If  $x \sin 135^\circ \cos^2 120^\circ = \frac{\tan^2 120^\circ \operatorname{cosec} 150^\circ}{\cot^2 30^\circ \sec^2 135^\circ}$ , then x is :

- [a] 2      [b] 4      [c] 8      [d] 16

13. Evaluate :  $\cos A + \sin(270^\circ + A) - \sin(270^\circ - A) + \cos(180^\circ + A)$

- [a] -1      [b] 0      [c] 1      [d] none of these

14.  $\tan A \sin\left(\frac{\pi}{2} + A\right) \cos\left(\frac{\pi}{2} - A\right)$  is equal to

- [a] 1      [b] 0      [c]  $\frac{1}{\sqrt{2}}$       [d] none of these

15. The value of  $\frac{\cos(\pi+x)\cos(-x)}{\sin(\pi-x)\cos(\frac{\pi}{2}+x)}$  is equal to :

- [a]  $1-\cot^2A$       [b]  $\cot^2A-1$       [c]  $1-\operatorname{cosec}^2A$       [d]  $\operatorname{cosec}^2A-1$

16. The value of  $\cos(1770^\circ)$

- [a]  $\cos 45^\circ$       [b]  $-\cos 45^\circ$       [c]  $\cos 60^\circ$       [d]  $\cos 30^\circ$

17. The value of  $\cos(1680^\circ) + \sin(1290^\circ)$

- [a] 2      [b] -1      [c] 0      [d] 1

18. The value of  $3\cos^2\frac{\pi}{4} + \sec\frac{2\pi}{3} + 5\tan^2\frac{\pi}{3}$  is

- [a] 29/3      [b] 29/4      [c] 29/2      [d] 29/5

19. The value of  $(3\cos\frac{\pi}{3}\operatorname{cosec}\frac{\pi}{6} - 4\sin\frac{5\pi}{6}\tan\frac{\pi}{4})\cos 2\pi$

- [a] 0      [b] -1      [c] 1      [d]  $\frac{1}{2}$

20. Value of  $A$  ( $0 < A < 360^\circ$ ) satisfying  $\operatorname{cosec}A + 2 = 0$

- [a]  $210^\circ, 300^\circ$       [b]  $240^\circ, 300^\circ$       [c]  $210^\circ, 240^\circ$       [d]  $210^\circ, 330^\circ$

### ASSERTION AND REASONING

[a] A is false and R is true.

[b] A is true and R is false.

[c] Both A and R are true and R is the correct explanation of A.

[d] Both A and R are true but R is not the correct explanation of A.

1. Assertion :  $\tan 8A - \tan 6A + \tan 2A = \tan 8A \tan 6A \tan 2A$

Reason :  $\tan(A + B) = \frac{\tan A + \tan B}{1 - \tan A \tan B}$

2. Assertion : If two equal arcs of different circles subtend angles of  $36^\circ$  and  $45^\circ$  at the centre respectively, then the ratio of their radii is 5 : 4.

Reason : In a circle of radius  $r$ , an arc of length  $m$  subtends an angle of  $m/r$  radians at the centre.

3. Assertion : If  $\cot A = \frac{7}{24}$ ,  $\pi < x < \frac{3\pi}{2}$ , then the value of  $\sin A + \cos A$  is  $\frac{-31}{25}$ .

Reason : In third quadrant the value of  $\tan A$  and  $\cot A$  is +ve and other ratio is -ve.

4. Assertion : The value of  $\tan 75^\circ = \frac{\sqrt{6} + \sqrt{2}}{4}$

Reason :  $\tan(A + B) = \frac{\tan A + \tan B}{1 + \tan A \tan B}$

## Case Study

1. In a survey of 25 students, it was found that 21 had taken Mathematics, 26 had taken Physics and 29 had taken Chemistry, 14 had taken Mathematics and Physics, 12 had taken Mathematics and Chemistry, 14 had taken Physics and Chemistry and 8 had taken all the three subjects. Based on the above information, answer the following questions.

- [i] The number of students who had taken only Mathematics is  
[a] 8                      [b] 3                      [c] 4                      [d] 5
- [ii] The number of students who had taken at least one of the three subjects is  
[a] 45                      [b] 48                      [c] 44                      [d] 50
- [iii] The number of students who had taken only one of the subjects is  
[a] 20                      [b] 19                      [c] 15                      [d] 25
- [iv] The number of students who had taken Mathematics and Physics but not Chemistry is  
[a] 8                      [b] 9                      [c] 6                      [d] 11
- [v] The number of students who had taken Chemistry and Physics but not Mathematics is  
[a] 4                      [b] 3                      [c] 8                      [d] 6

2. The mathematics teacher was teaching the students of class XI the following concepts of trigonometric equations. An equation involving trigonometric functions of an unknown angle or angles is called a trigonometric equation. The solution in the interval  $[0, 2\pi]$  is called the principal solution of the given equation.

**Based on the above information, answer the following questions.**

- [i] If  $\tan x = \frac{-1}{2}$  and  $\operatorname{cosec} x = \frac{3}{2}$  then in which quadrant they lie.  
[a] I                      [b] II                      [c] III                      [d] IV
- [ii] The value of  $2\sin^2 x$  is equal to :  
[a]  $(1 - \cos x)$                       [b]  $(1 + \cos x)$                       [c]  $(1 + \cos 2x)$                       [d]  $(1 - \cos 2x)$
- [iii] If  $\cot x = -1/\sqrt{3}$  and  $x$  lies in 2<sup>nd</sup> quadrant the value of  $(1 + \sec x)$   
[a] 1                      [b] 3                      [c] -1                      [d] 0
- [iv] The degree measures of  $\left(\frac{8\pi}{9}\right)^\circ$  is :  
[a]  $320^\circ$                       [b]  $340^\circ$                       [c]  $280^\circ$                       [d]  $160^\circ$
- [v] The value of  $\cot 75^\circ$   
[a]  $3 + \sqrt{2}$                       [b]  $2 + \sqrt{3}$                       [c]  $2 - \sqrt{3}$                       [d]  $3 - \sqrt{2}$

### Activities

1. Draw the graph of the function  $f(x) = \begin{cases} 3 - x, & \text{if } x > 1 \\ 1, & \text{if } x = 1 \\ 2x, & \text{if } x < 1 \end{cases}$
2. Represent the given complex number on Arganda plane :  $\frac{2+i}{(1+i)(1-2i)}$
3. Draw the graph of  $\cos x$  such that the value of  $x$  lies between  $-180^\circ$  to  $180^\circ$

### Syllabus of UT (July)

1. Sets
2. Relations & Functions
3. Trigonometric Functions
4. Complex Number

### PHYSICAL EDUCATION

1. Make a project file on yoga and modern olympics
2. Revise chapters 1,2,3 for UNIT TEST

### MUSIC

#### Revise syllabus for Unit Test:-Unit 1, 2 and 4

- Q 1. Play and sing the notation of Gayatri Mantra with different scale or note.
- Q 2. Make a video of any classical or semi classical song, and send video through whatsapp on 9416726190.
- Q 3. Make a composition of Raga Bhairavi with following words-

प्रभुवर हमारे मन को , भक्ति का दान देना,  
सबके मैं काम आऊँ, बुद्धि का दान देना |  
जीवन में मेरे दाता, तेरा ही नाम गाऊं,  
तुम्हें छोड़ कर मैं दाता, कहीं और कैसे जाऊं |  
सुख में तुझे न भूलूँ , शक्ति का दान देना |

## ARTIFICIAL INTELLIGENCE

### **A. Revise following syllabus for Unit Test, July-2025**

Unit 1: Introduction: Artificial Intelligence for Everyone

Unit 2: Unlocking your Future in AI

Unit 1: Communication Skill- III (Employability Skill Book)

### **B. Make a presentation on any of the following topics:**

1. Applications of AI
2. Machine Learning
3. Unlocking your Future in AI

**Send ppt by mail on following mail id : activities.davftb@gmail.com .**

Please note that you have to mention your Name, Roll No, Class, Section and admission number in subject section of EMail.

For example-

Abhishek, Roll No 38, XI NM, 9899

# Physics Worksheet

## Multiple choice questions

- A person sitting in a moving car is at rest with respect to
  - a tree on the ground
  - a cyclist on the road
  - a building on the roadside
  - the car
- The motion of the wheel of a cycle is
  - rotatory
  - rectilinear
  - translatory and rotatory
  - None of these
- A man has to go 50 m due north, 40 m due east and 20 m due south to reach a field. His displacement from his house to the field is,
  - 110 m
  - $20\sqrt{5}$  m
  - 75 m
  - 50 m
- The numerical ratio of displacement to distance for a moving object is
  - always less than 1
  - always equal to 1
  - always more than 1
  - equal or less than 1
- A monkey is moving on circular path of radius 80 m. If the monkey starts at one end of the diameter and reaches the other end, the displacement and the distance covered by the monkey are respectively,
  - 160 m ; 160 m
  - 160 m ;  $80\pi$  m
  - 0 m ;  $80\pi$  m
  - 160 m ;  $160\pi$  m
- In which of the following cases of motions, the distance moved and the magnitude of displacement are equal ?
  - If the car is moving on straight road
  - If the car is moving in circular path
  - The pendulum is moving to and fro
  - The earth is revolving around the Sun
- A body moved from one end to another end along a curved path of a quarter circle. The ratio of distance to displacement is
  - $\frac{\pi}{2\sqrt{2}}$
  - $\frac{2\sqrt{2}}{\pi}$
  - $\frac{\sqrt{2}}{\pi}$
  - $\frac{\pi}{\sqrt{2}}$
- A ball is thrown up with a certain velocity. It attains a height of 40 m and comes back to the thrower, then
  - total distance covered by it is 40 m
  - total displacement covered by it is 80 m
  - total displacement is zero
  - total distance covered by it is zero
- A body moves on three quarters of a circle of radius r. The displacement and distance travelled by it are
  - displacement = r, distance = 3r
  - displacement =  $\sqrt{2}r$ , distance =  $\frac{3\pi r}{2}$
  - distance = 2r, displacement =  $\frac{3\pi r}{2}$
  - displacement = 0, distance =  $\frac{3\pi r}{2}$
- For the motion on a straight line path with constant acceleration, the ratio of the magnitude of the displacement to the distance covered is
  - = 1
  - $\geq 1$
  - $\leq 1$
  - $< 1$
- A body moves along the circumference of a circular track. It returns back to its starting point after completing the circular track twice. If the radius of the track is R, the ratio of displacement to the distance covered by the body will be
  - 0
  - $8\pi R$
  - $\sqrt{3}R$
  - $\frac{R}{R}$
- A particle is travelling with a constant speed. This means that
  - Its position remains constant as time passes
  - It covers equal distances in equal time intervals
  - Its acceleration is zero
  - It does not change its direction of motion
- A boy runs for 10 min at a uniform speed of 9 km/h. At what speed should he run for the next 20 min so that the average speed comes to 12 km/h ?
  - 13.5 km/h
  - 10.2 km/h
  - 8.2 km/h
  - 7.72 km/h

14. A car moves at a speed of 60 km/hr for 50 km and 80 km/hr for the next 50 km. What is average speed (in km/hr) of car for the journey of 100 km ?  
 (1) 68.6 (2) 70  
 (3) 75 (4) 72.6
15. A train moving on linear way travels a distance 'D' at constant velocity of 30 km/h, then it travels in opposite direction with same distance and reaches at original station at a constant velocity of 45 km/h. What is the average speed of train ?  
 (1) 36 km/h (2) 10 km/h  
 (3) 0 (4) 75 km/h
16. An object travels 16 m in 4 seconds, then another 16m in 2 seconds. Its average speed is  
 (1) 6 m/sec (2) 5 m/sec  
 (3) 8 m/sec (4) 5.3 m/sec
17. The rate of change of displacement with time is  
 (1) speed (2) acceleration  
 (3) retardation (4) velocity
18. A car travels a distance A to B at a speed of 40 km/hr and returns to A at a speed of 30 km/hr. The average velocity (in km/hr) for the whole journey is,  
 (1) 34.3 (2) 0 (3) 35 (4) 36.3
19. A passenger travels along a straight line with velocity  $v_1$  for first half time and with velocity  $v_2$  for next half time, then the mean velocity  $v$  is given by,  
 (1)  $v = \sqrt{\frac{v_2}{v_1}}$  (2)  $v = \sqrt{v_1 v_2}$   
 (3)  $v = \frac{2v_1 v_2}{v_1 + v_2}$  (4)  $v = \frac{v_1 + v_2}{2}$
20. A car travels  $\frac{1}{3}$  rd distance on a straight road with a velocity of 10 km/hr, next  $\frac{1}{3}$  rd with velocity 20 km/hr and the last  $\frac{1}{3}$  rd with velocity 60 km/hr. What is the average velocity of the car in the whole journey?  
 (1) 4 km/hr (2) 6 km/hr  
 (3) 12 km/hr (4) 18 km/hr
21. A cyclist moving on a circular track of radius 40 m completes half revolution in 40 seconds. Its average velocity is  
 (1)  $2\pi$  m/sec (2) 2 m/sec  
 (3)  $4\pi$  m/sec (4) 4 m/sec
22. A quantity has a value of  $-6.0$  m/s. It may be the  
 (1) Speed of a particle  
 (2) Velocity of a particle  
 (3) Acceleration of a particle  
 (4) Position of a particle
23. An insect moves along the sides of a wall of dimensions 12 m  $\times$  5 m starting from one corner and reaches the diagonally opposite corner. If the insect takes 2 s for its motion then find the ratio of average speed to average velocity of insect.  
 (1) 15 : 4 (2) 1 : 1 (3) 12 : 7 (4) 17 : 13
24. When the distance travelled by an object is directly proportional to the time, it is said to travel with  
 (1) constant acceleration (2) uniform velocity  
 (3) zero velocity (4) constant speed
25. The rate of change of velocity with time is  
 (1) Speed (2) Displacement  
 (3) Distance (4) Acceleration
26. A bus decreases its speed from 80 km/hr to 60 km/hr in 5 sec. The acceleration of the bus is  
 (1)  $2.1 \text{ m/s}^2$  (2)  $-3.4 \text{ m/s}^2$   
 (3)  $-1.1 \text{ m/s}^2$  (4)  $3.2 \text{ m/s}^2$
27. The CGS unit of acceleration is  
 (1)  $\text{m/s}^2$  (2)  $\text{m/s}$  (3)  $\text{cm/min}^2$  (4)  $\text{cm/s}^2$
28. Which of the following is not a vector quantity?  
 (1) Retardation  
 (2) Acceleration due to gravity  
 (3) Average speed  
 (4) Displacement
29. A rubber ball dropped from a certain height is an example of  
 (1) non-uniform acceleration  
 (2) uniform retardation  
 (3) uniform speed  
 (4) non-uniform speed
30. If the displacement of an object is proportional to square of time, then the object moves with  
 (1) uniform velocity  
 (2) uniform acceleration  
 (3) increasing acceleration  
 (4) decreasing acceleration

31. If the velocity of a body does not change, its acceleration is  
 (1) zero (2) infinite  
 (3) unity (4) none of these
32. A body whose speed is constant  
 (1) has a constant velocity  
 (2) might be accelerated  
 (3) must be accelerated  
 (4) cannot be accelerated
33. When the brakes are applied on a moving cycle, the directions of velocity and acceleration are  
 (1) opposite (2) same  
 (3) perpendicular (4) not related
34. The velocity acquired by a body moving with uniform acceleration is 20 m/s in first 2 sec and 40 m/s in first 4 sec. The initial velocity of the body is  
 (1) 40 m/s (2) 20 m/s  
 (3) 10 m/s (4) 0 m/s
35. A car starts from rest and moves along the x-axis with constant acceleration  $5 \text{ m s}^{-2}$  for 8 seconds. If it then continues with constant velocity, what distance will the car cover in 12 seconds since it started from rest ?  
 (1) 160 m (2) 200 m  
 (3) 320 m (4) 400 m
36. A person travelling at 43.2 km/hr applies the brakes giving a deceleration of  $12 \text{ m/s}^2$  to his bike. The distance it travels before coming to rest is  
 (1) 12 m (2) 4 m  
 (3) 6 m (4) 9 m
37. A bullet going with speed 150 m/s enters in a concrete wall and penetrates a distance of 15 cm before coming to rest. The retardation that offered by the wall is  
 (1)  $15 \times 10^4 \text{ m/s}^2$  (2)  $7.5 \times 10^4 \text{ m/s}^2$   
 (3)  $3.75 \times 10^4 \text{ m/s}^2$  (4)  $30 \times 10^4 \text{ m/s}^2$
38. A particle moving with a uniform acceleration travels 24 m and 64 m in the first two consecutive intervals of 4 sec each. Its initial velocity (in m/s) is  
 (1) 1 (2) 10  
 (3) 5 (4) 2
39. A particle experiences a constant acceleration for 20 sec after starting from rest. If it travels a distance  $S_1$  in the first 10 sec and a distance  $S_2$  in the next 10 sec, then  
 (1)  $S_1 = S_2$  (2)  $S_1 = S_2/3$   
 (3)  $S_1 = S_2/2$  (4)  $S_1 = S_2/4$
40. A body starts from rest and accelerates uniformly. Ratio of distances travelled in one, two and three seconds of its motion is  
 (1) 1 : 3 : 5 (2) 1 : 4 : 9  
 (3) 1 : 2 : 3 (4) 9 : 4 : 1
41. A body covers 200 cm in the first 2 sec and 220 cm in next 4 sec. What is the velocity of the body at the end of 7th second?  
 (1) 40 cm/sec (2) 20 cm/sec  
 (3) 10 cm/sec (4) 5 cm/sec
42. A body moving along a straight line at 20 m/sec undergoes an acceleration of  $4 \text{ m/sec}^2$ . After two seconds its speed will be :  
 (1) 12 m/sec (2) 28 m/sec  
 (3) 72 m/sec (4) 20 m/sec
43. Average velocity of an object is equal to the mean of its initial and final velocities if the acceleration is  
 (1) variable (2) uniform  
 (3) both of the above (4) Can't be said
44. A body starts from rest and moves with uniform acceleration for 2s. It then decelerates uniformly for 3s and stops. If deceleration is  $4 \text{ ms}^{-2}$ , the acceleration of the body is \_\_\_\_\_  $\text{ms}^{-2}$ .  
 (1) 10 (2) 8.7 (3) 4 (4) 6
45. In the equation of motion :  $s = at + bt^2$ , the units of a and b are respectively.  
 (1)  $\text{m/s}^2, \text{m/s}^2$  (2)  $\text{m/s}, \text{m/s}^2$   
 (3)  $\text{m/s}^2, \text{m/s}^3$  (4)  $\text{m/s}, \text{m/s}^3$
46. A body travels a distance of 20 m in the 7th second and 24 m in 9th second. The distance travelled by it in the 15th second is,  
 (1) 36 m (2) 32 m (3) 42 m (4) 44 m
47. A particle starts from rest and moves with uniform acceleration. Then the ratio of distance covered in  $n^{\text{th}}$  sec. to that in n sec. is  
 (1)  $\frac{n^2}{2n+1}$  (2)  $\frac{2n-1}{n^2}$   
 (3)  $\frac{n^2}{2n-1}$  (4)  $\frac{2n+1}{n^2}$
48. The initial velocity of a particle is 10 m/sec and its retardation is  $2 \text{ m/sec}^2$ . The distance moved by the particle in 5th sec of its motion is :  
 (1) 31 m (2) 52 m (3) 1 m (4) 1 cm

49. A heavy ball falls freely, starting from rest. Between  $t = 3$  s and  $t = 4$  s, it travels a distance of ( $g = 9.8 \text{ m/s}^2$ )  
 (1) 4.9 m (2) 9.8 m  
 (3) 29.4 m (4) 34.3 m
50. A stone is dropped from the top of a tower. If it travels 34.3 m in the last second before it reaches the ground, find the height of the tower ( $g = 9.8 \text{ m/s}^2$ )  
 (1) 39.2 m (2) 58.8 m  
 (3) 78.4 m (4) 98 m
51. A body starting from rest and moving with a constant acceleration covers a distance  $S_1$  in the 4th second and a distance  $S_2$  in the 6th second. The ratio  $S_1/S_2$  is  
 (1)  $2/3$  (2)  $4/9$  (3)  $6/11$  (4)  $7/11$
52. A body with an initial velocity of 3 m/s moves with an acceleration of  $2 \text{ m/s}^2$ , then the distance travelled in the 4th second is  
 (1) 10 m (2) 6 m (3) 7 m (4) 28 m
53. A stone is dropped into a well in which the level of water is  $h$ , below the top of the well. If  $v$  is velocity of sound, then time  $T$  after which the splash is heard is equal to  
 (1)  $\frac{2h}{v}$  (2)  $\sqrt{\frac{2h}{v}} + \frac{h}{g}$   
 (3)  $\sqrt{\frac{2h}{g}} + \frac{h}{v}$  (4)  $\sqrt{\frac{h}{2g}} + \frac{2h}{v}$
54. If two bodies of different masses  $m_1$  and  $m_2$  are dropped from different heights  $h_1$  and  $h_2$ , then ratio of the time taken by the two to drop through these distances is  
 (1)  $h_1 : h_2$  (2)  $h_2/h_1$   
 (3)  $\sqrt{h_1} : \sqrt{h_2}$  (4)  $h_1^2 : h_2^2$
55. A stone is thrown vertically upward with an initial velocity  $u$  from the top of a tower, reaches the ground with a velocity  $3u$ . The height of the tower is  
 (1)  $\frac{3u^2}{g}$  (2)  $\frac{4u^2}{g}$  (3)  $\frac{6u^2}{g}$  (4)  $\frac{9u^2}{g}$
56. Acceleration of a body projected upwards with a certain velocity is  
 (1)  $9.8 \text{ m/s}^2$  (2)  $-9.8 \text{ m/s}^2$   
 (3) zero (4) insufficient data
57. A body is dropped from the top of a tower and reaches the ground in 3 sec. Then the height of the tower is :  
 (1) 44.1 m (2) 40.2 m  
 (3) 62.3 m (4) None of these
58. A body is projected up with an initial velocity of 10 m/sec. It will return to its starting point after:  
 (1) 6 seconds (2) 10 seconds  
 (3) 2 seconds (4) 2 hours
59. At the maximum height of a body thrown vertically up  
 (1) Velocity is not zero but acceleration is zero  
 (2) Acceleration is not zero but velocity is zero  
 (3) Both acceleration and velocity are zero  
 (4) Both acceleration and velocity are not zero
60. A ball is thrown vertically upwards with a velocity of 49 m/s. The maximum height to which it rises and the total time it takes to return to the surface of the earth are respectively ( $g = 9.8 \text{ m/s}^2$ ),  
 (1) 100 m ; 4 s (2) 110.5 m ; 6 s  
 (3) 150 m ; 5 s (4) 122.5 m ; 10 s
61. A stone is thrown vertically upward with an initial velocity of 40 m/s. Taking  $g = 10 \text{ m/s}^2$ , what is the net displacement and the total distance covered by the stone when it returns to earth ?  
 (1) 0 m ; 150 m  
 (2) 0 m ; 160 m  
 (3) 75 m ; 150 m  
 (4) 80 m ; 160 m
62. A stone is allowed to fall from the top of a tower 100 m high and at the same time another stone is projected vertically upwards from the ground with a velocity of 25 m/s. When and where the two stones will meet ? (Take,  $g = 10 \text{ m/s}^2$ )  
 (1) The stones will meet at a height of 20 m above the ground after 4 s  
 (2) The stones will meet at a height of 16 m above the ground after 4 s  
 (3) The stones will meet at a height of 24 m above the ground after 6 s  
 (4) The stones will meet at a height of 18 m above the ground after 3 s

63. An object is thrown vertically upward at 35 m/s. Taking  $g = 10 \text{ m/s}^2$ , the velocity of the object 5 s later is

- (1) 15 m/s down                      (2) 7.0 m/s up  
 (3) 15 m/s up                        (4) 85 m/s down

64. A stone is released from a balloon that is descending at a constant speed of 10 m/s. Neglecting air resistance, after 20 s the speed of the stone is ( $g = 9.8 \text{ m/s}^2$ )

- (1) 2160 m/s                          (2) 1760 m/s  
 (3) 206 m/s                          (4) 196 m/s

65. A stone is dropped from the top of a tower 500 m high into a pond of water at the base of the tower. When is the splash heard at the top? Given,  $g = 10 \text{ ms}^{-2}$ ; speed of sound = 340 m/s.

- (1) 11.47 s                            (2) 10 s  
 (3) 13.5 s                            (4) 15.42 s

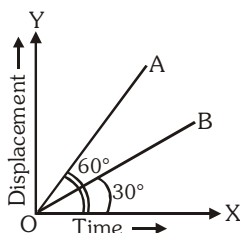
66. If the time of fall of two objects are in the ratio 1 : 2, find the ratio of the heights from which they fall.

- (1) 1 : 2    (2) 2 : 1    (3) 1 : 4    (4) 4 : 1

67. Two bodies are held separated by 9.8 m vertically one above the other. They are released simultaneously to fall freely under gravity. After 2 s the distance between them is

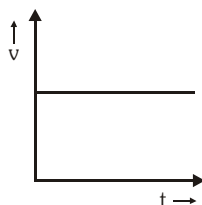
- (1) 4.9 m    (2) 19.6 m    (3) 9.8 m    (4) 39.2 m

68. From the position time graph for two particles A and B is shown below. Graph A and graph B are making angles  $60^\circ$  and  $30^\circ$  with the time axis. The ratio of velocities  $v_A : v_B$  is



- (1) 1 : 1                                      (2) 3 : 1  
 (3)  $\sqrt{3} : 1$                                 (4) 1 : 3

69. From the given  $v - t$  graph, it can be inferred that the object is

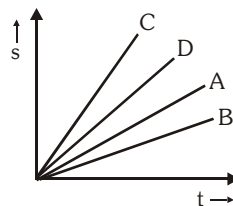


- (1) in uniform motion  
 (2) at rest  
 (3) in non-uniform motion  
 (4) moving with uniform acceleration

70. Area under a  $v - t$  graph represents a physical quantity which has the unit

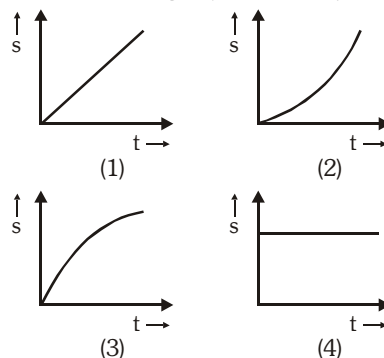
- (1)  $\text{m}^2$                                       (2) m  
 (3)  $\text{m}^3$                                       (4)  $\text{m s}^{-1}$

71. Four cars A, B, C and D are moving on a levelled road. Their distance versus time graphs are shown in fig.. Choose the correct statement



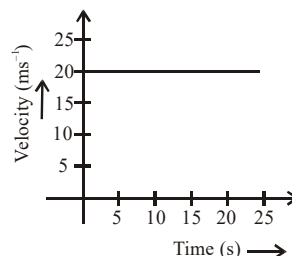
- (1) Car A is faster than car D.  
 (2) Car B is the slowest.  
 (3) Car D is faster than car C.  
 (4) Car C is the slowest.

72. Which of the following figures represents uniform motion of a moving object correctly?



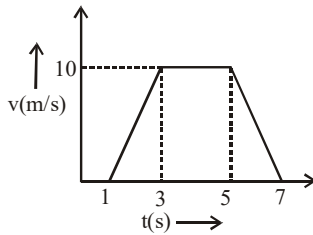
73. Slope of a velocity - time graph gives  
 (1) the distance                          (2) the displacement  
 (3) the acceleration                      (4) the speed

74. The velocity-time graph shows the motion of a cyclist. Its acceleration and the distance covered by the cyclist in 15 seconds are respectively,

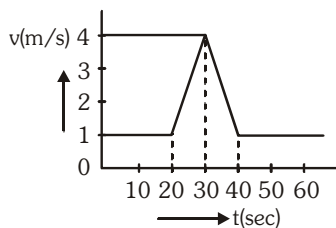


- (1)  $1.33 \text{ m/s}^2$ ; 150 m  
 (2)  $0 \text{ m/s}^2$ ; 150 m  
 (3)  $1.33 \text{ m/s}^2$ ; 300 m  
 (4)  $0 \text{ m/s}^2$ ; 300 m

75. A particle moves according to given velocity-time graph. Then, the ratio of distance travelled in last 2 seconds to the total distance travelled is

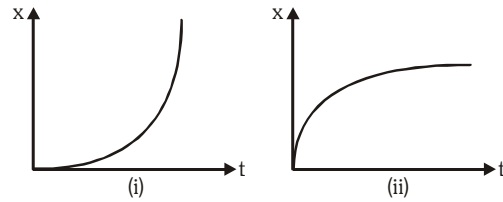


- (1)  $1/4$  (2)  $1/2$   
 (3)  $1/8$  (4)  $1/6$
76. The velocity of a body increases for sometime, then remains constant and then decreases until it comes to rest. When velocity is plotted against time the fig. obtained is :
- (1) triangle  
 (2) trapezium  
 (3) circle  
 (4) None of the above
77. The area under the acceleration-time graph represents :
- (1) change in velocity (2) speed  
 (3) velocity (4) acceleration
78. When a graph between one quantity versus another results in a straight line with positive slope, the quantities are
- (1) directly proportional  
 (2) both constant  
 (3) inversely proportional  
 (4) zero
79. Velocity time ( $v - t$ ) graph for a moving object is shown in the figure. Total displacement of the object during the time interval when there is non-zero acceleration and retardation is

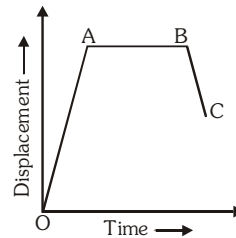


- (1) 60 m (2) 50 m  
 (3) 30 m (4) 40 m

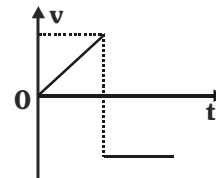
80. Figures (i) and (ii) below show the displacement-time graphs of two particles moving along the x-axis. We can say that



- (1) Both the particles are having a uniformly accelerated motion  
 (2) Both the particles are having a uniformly retarded motion  
 (3) Particle (i) is having a uniformly accelerated motion while particle (ii) is having a uniformly retarded motion  
 (4) Particle (i) is having a uniformly retarded motion while particle (ii) is having a uniformly accelerated motion
81. In fig, BC represents a body moving

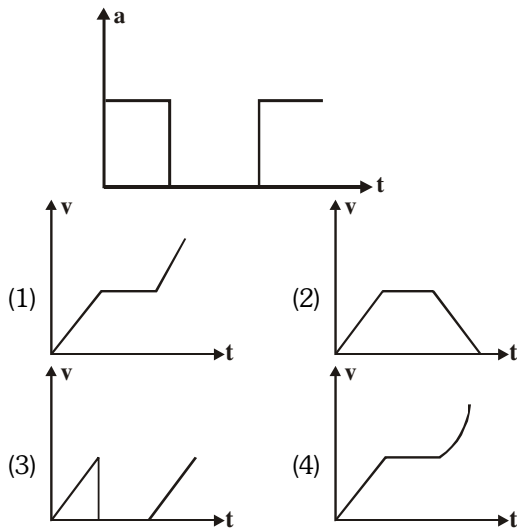


- (1) Backward with uniform velocity  
 (2) Forward with uniform velocity  
 (3) Backward with non-uniform velocity  
 (4) Forward with non-uniform velocity
82. The velocity-time graph for a particle moving along x-axis is shown in the figure. The corresponding displacement -time graph is correctly shown by

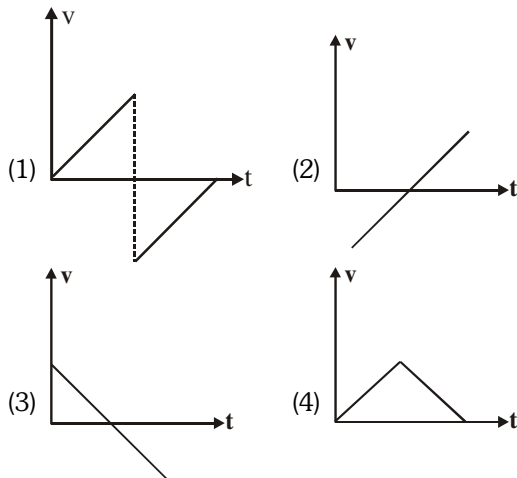


- (1) (2)   
 (3) (4)

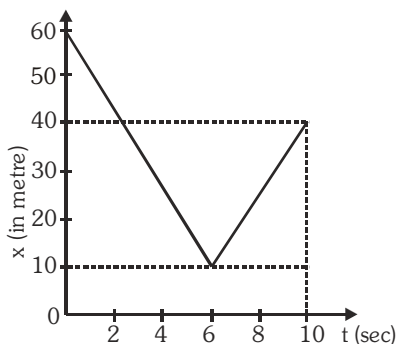
83. Which of the following graphs would probably show the velocity plotted against time graph for a body whose acceleration-time graph is shown in the figure?



84. The velocity-time graph of a body falling from rest under gravity and rebounding from a solid surface is represented by which of the following graphs?



85. The fig. shows the displacement-time graph of a particle moving on a straight line path. What is the average velocity of the particle over 10 seconds?



- (1)  $2 \text{ ms}^{-1}$  (2)  $4 \text{ ms}^{-1}$  (3)  $6 \text{ ms}^{-1}$  (4)  $8 \text{ ms}^{-1}$

86. Suppose a boy is enjoying a ride on a merry-go-round which is moving with a constant speed of  $10 \text{ m s}^{-1}$ . It implies that the boy is

- (1) at rest  
(2) moving with no acceleration  
(3) in accelerated motion  
(4) moving with uniform velocity

87. The constant quantity in a uniform circular motion is

- (1) linear speed (2) centripetal force  
(3) acceleration (4) momentum

88. Two cars of masses  $m_1$  and  $m_2$  are moving along the circular paths of radius  $r_1$  and  $r_2$  respectively. The speeds are such that they complete one round at the same time. The ratio of angular speeds of two cars is

- (1)  $m_1 : m_2$  (2)  $r_1 : r_2$   
(3)  $1 : 1$  (4)  $m_1 r_1 : m_2 r_2$

89. A wheel is of diameter  $1\text{m}$ . If it makes  $30$  revolutions/sec., then the linear speed (in  $\text{m/s}$ ) of a point on its circumference is

- (1)  $30\pi$  (2)  $\pi$  (3)  $60\pi$  (4)  $\pi/2$

90. The angular velocity (in  $\text{rad/hr}$ ) of the earth's rotation about its axis is

- (1)  $12/\pi$  (2)  $\pi/12$   
(3)  $48/\pi$  (4)  $\pi/24$

91. An aeroplane revolves in a horizontal circle above the surface of the earth with a uniform speed of  $100 \text{ km/hr}$ . The change in velocity (in  $\text{km/hr}$ ) after completing  $1/2$  revolution is

- (1) 200 (2) 150  
(3) 300 (4) 400

92. In uniform circular motion

- (1) acceleration & velocity both remain constant  
(2) acceleration & speed both remain constant  
(3) acceleration & velocity both keep on changing  
(4) acceleration constant but speed changes

93. Angular velocity of minute hand of a watch is

- (1)  $\pi/3600 \text{ rad/s}$  (2)  $\pi/1800 \text{ rad/s}$   
(3)  $\pi/7200 \text{ rad/s}$  (4)  $\pi/900 \text{ rad/s}$

94. The ratio of angular speed of hour's hand and second's hand of a clock is

- (1)  $1 : 1$  (2)  $1 : 60$   
(3)  $1 : 720$  (4)  $1 : 3600$

- 95.** The angular speed (in rad/s) of a fly wheel making 120 revolutions/minute is  
 (1)  $2\pi$       (2)  $8\pi$       (3)  $\pi$       (4)  $4\pi$
- 96.** A particle is moving in a horizontal circle with constant speed. It has constant  
 (1) Velocity                      (2) Acceleration  
 (3) Kinetic energy              (4) Displacement
- 97.** The earth's radius is 6400 km. It makes one rotation about its own axis in 24 hrs. The centripetal acceleration of a point on its equator is nearly  
 (1)  $340 \text{ cm/s}^2$                   (2)  $34 \text{ cm/s}^2$   
 (3)  $3.4 \text{ cm/s}^2$                   (4)  $0.34 \text{ cm/s}^2$
- 98.** The acceleration of a point on the rim of flywheel 1 m in diameter, if it makes 1200 revolutions per minute is  
 (1)  $8\pi^2 \text{ m/s}^2$                   (2)  $80 \pi^2 \text{ m/s}^2$   
 (3)  $800 \pi^2 \text{ m/s}^2$               (4) none of these

- 99.** A particle revolves in a circular path. The acceleration of the particle is :  
 (1) along the tangent  
 (2) zero  
 (3) along the radius  
 (4) None of these
- 100.** Which equation is used to find out the speed of object moving in uniform circular motion ?  
 (1)  $\frac{\pi r}{T}$                                   (2)  $\frac{\pi r}{2T}$   
 (3)  $\frac{2\pi r}{T}$                                   (4)  $\frac{2\pi r}{(T/2)}$