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

Website: www.davfatehabad.in E. Mail: sbpdavftb@yahoo.co.in, Ph. 01667-222664

## Holidays' Assignments for Summer Vacations, June-2023 <br> Class: XI Nonmedical

## General Instructions:

1. Get up early in the morning and go out for a walk daily. Do yoga daily for healthy living.
2. The summer break for class VI-XII will be from 01.06.2023 to 02.07.2023 (Both days inclusive). School will reopen on 03.07.2023.
3. Revise the syllabus of all subjects done before summer vacations for Unit Tests to be started from 04.07.2023.
4. Try to make your handwriting better by practicing and do your HW in good handwriting.
5. Register \& Participate in $1^{\text {st }}$ stage of $9^{\text {th }}$ Online International Humanity Olympiad by accessing through our web portal - http://www.humanityolympiad.org or Android App Awake Humanity (play store). Every individual passing the exam (i.e. scoring minimum $\mathbf{4 0 \%}$ ) will get an e-certificate through e-mail immediately on their emails. School code is : FATE103.

## English Core

Revise following syllabus for U.T.
Hornbill :
1-The Portrait Of A Lady
Snapshot:
1.The Summer of The Beautiful White Horse
2.The Address
3.Mother's Day

Grammar: Tenses, Prepositions, Unseen Passage

1. Do worksheets from BBC in neat and clean handwriting (Use pencil only)

Worksheet 1to 5(Reading Comprehensions)
First five worksheets of Tenses, Prepositions
2. Write the review of any motivational book written by Mr. Robin Sharma. Complete it using these points- Title, Author's name, Publisher, Number of pages, Price, Target, Brief summary, some quotes from the book
3. On account of Father's Day, write a letter to your father expressing your love, respect and gratitude towards him by using an A 4 sheet.
(A)Give this letter to him on Father's Day.
(B)Click a picture of his expression on receiving the letter. Get his comment noted on the letter and paste the letter on your scrapbook.
4. Yoga was originated in India from Hindu scriptures and practised world wide. People have understood how yoga helps to exercise and calm the body. In this context, write a few lines about Indian Yoga Guru Baba Ram Dev who is famous personality of Haryana.
5. Write 30 new words following the below given format.

| Word | Synonym | Antonym | Derived from | Usage |
| :--- | :--- | :--- | :--- | :--- |
|  |  |  |  |  |

## Chemistry

## - REVISE chapters 1,2 and 3 for U.T

- Investigatory Project Report to be made on the topics allotted in class.
- Do all the NCERT Exemplar questions of chapters completed in class.
- Do following assignment in your holidays' homework notebook

1) Which is better method molarity or molality?
2) How much $\mathrm{CO}_{2}$ is produced when 6 gm of Carbon is burnt in excess Oxygen?
3) 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.
4) 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.
5) 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) $\quad A$ is true but $R$ is false.
iii) $\quad A$ is false but $R$ is true.
iv) Both A and R are false.
6) 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) $\quad \mathrm{A}$ is true but R is false.
iii) $\quad \mathrm{A}$ is false but R is true.
iv) Both A and R are false.
7) 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
8. Assertion (A) : Generally, ionisation enthalpy increases from left to right in a period.

Reason (R): When successive electrons are added to the orbitals in the same principal quantum level, the shielding effect of inner core of electrons does not increase very much to compensate for the increased attraction of the electron to the nucleus.
(i) Assertion is correct statement and reason is wrong statement.
(ii) Assertion and reason both are correct statements and reason is correct explanation of assertion.
(iii) Assertion and reason both are wrong statements.
(iv) Assertion is wrong statement and reason is correct statement.
9. 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 $170 \mathrm{gm} / \mathrm{mol}$.
10. The density of 3 M solution of NaCl is $1.25 \mathrm{gm} / \mathrm{ml}$. Calculate the molality of the solution.
11. 10 L of a welding gas weighs 11.6 gm at STP. Calculate the molar mass of this gas.
12. Calculate the number of atoms in (a) 5 L oxygen gas at STP (b) 4.4 gm of $\mathrm{CO}_{2}$ (c) $52 \mathrm{a} . \mathrm{mu}$ of He
13. Calculate the number of moles in (a) 5 L of $0.75 \mathrm{M} \mathrm{Na}_{2} \mathrm{CO}_{3}$ (b) 7.85 gm iron (c) 34.2 gm of sucrose
14. 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.
15. What are the main points and limitations of Dalton's atomic theory?
16. 50 kg of $\mathrm{N}_{2}$ and 10 kg of hydrogen gas are mixed to produceammonia gas. Calculate mass of ammonia gas formed. Identify limiting reagent in the production of $\mathrm{NH}_{3}$ in this solution.
17.3.0 g of $\mathrm{H}_{2}$ react with $29.0 \mathrm{~g} \mathrm{O}_{2}$ to yield $\mathrm{H}_{2} \mathrm{O}$.
i. What is the limiting reactant?
ii. Calculate the maximum amount of water that can be formed.
iii. Calculate the amount of one of the reactants which remains unreacted.
18. Chlorine has two isotopes of atomic mass units 34.97 u and 36.97 u . the relative abundances of these two isotopes are 0.735 and 0.245 respectively. Find out average atomic mass of chlorine.
19. Prepare at least two conversions for each:
a) $\mathrm{m}^{3}$ to litre b) $\mathrm{m}^{3}$ to $\mathrm{cm}^{3}$
c) atm to barrd) Kelvin to ${ }^{\circ} \mathrm{F}$
e) $\mathrm{cm}^{2}$ to $\mathrm{nm}^{2}$
20. 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.
21. An organic liquid having Carbon, hydrogen, oxygen and nitrogen contains $\mathrm{C}=41.37 \%, \mathrm{H}=5.75 \%, \mathrm{~N}=16.09 \%$ and rest is oxygen. Calculate the molecular formula of liquid if its V.D. is 43.
22. Define black body and black body radiations.
23. Write the electronic configuration of Cu and Cr .
24. An ion with mass number 56 contains 3 units of positive charge and $30.4 \%$ more neutrons than electrons .assign symbol to the ions.
25. 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.
26. What is the lowest value of $n$ which allows ' $g$ ' orbital to exist.
27. What transiton in a hydrogen spectrum would have the same wavelength as in the

Balmertransition $n=4$ to $n=2$ of $\mathrm{He}^{+}$spectrum?
28. Write postulates of Bohr's model of atom
29. Write postulates of Bohr's model of atom.
30. Define Heisenberg's uncertainty principle.
31. Difference between orbit and orbital.
32. Explain Aufbau's principle
33. Write complete electronic configuration of elements from 1 to 40.
34. What is ionization energy? How it varies from left to right and top to bottom in a periodic table?
35. What is electronegativity? Arrange the given elements in increasing order of electroneagtivity:

Nitrogen, Oxygen, Carbon, Hydrogen, Bromine, Chlorine, Fluorine, Sulphur, phosphorus, Iodine
36. Why atomic masses are the average values? Explain by giving example.
37. Why is molality preferred over molarity in expressing concentration of solution?
38. In combustion of methane, which is limiting reagent and why?
39. 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.
40. 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?
41. Define Quantum numbers. Show that how different quantum numbers are related with each other.
42. State and explain de- Broglie relation.
43. How many no. of nodes are present in 3P orbital?
44. Why Heisenberg uncertainty principle has no significance in our daily life?
45. What are the advantages of long form of periodic table?
46. What are the limitations of mendleev's periodic table?
47. What are the general characterstics of $s$ and $p$ block elements?
48. What are the factors affecting Ionization energy?
49. The first ionization energy of Carbon atom is greater than that of Boron, whereas reverse is true for second ionization enthalpy. Explain.
50. Complete the practical file and do all the NCERT questions of above chapter.

## Physical Education

Learn Chapter 1 to 3 for July Unit Test :-
$>$ Make a list of various career options in Physical education
$>$ Make a list of rule and regulations of International Olympic Committee and Modern Olympic Games.
$>$ Draw the Pictures of Yogic Kriyas (Shat Karma) and describe its benefits.

- Neti Kriya
- Dhouti Kriya
- Nouli Kriya
- Kapalbhati Kriya
- Tratak Kriya


## Music

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 Bhairav with following words-
प्रभुवर हमारे मन को , भक्ति का दान देना,
सबके मैं काम आऊ, 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 भूलूं, शक्ति का दान देना |

## Syllabus for UT:

1. Teen tala and Ek Tala with single and double.
2. Short noes on Nada, Saptak, Swara
3. Detailed description of Drupad
4. Music elements in Natyashastra.

## Computer Science

1. Prepare a presentation on any one of the topics listed below and share it with activities.davftb@gmail.com

- Wi-Fi Networking Concepts
- Social Networking effects
- Cyber Laws / Security
- What makes a country developed?
- Cyber Crimes
- Internet Vs Newspapers
- Technologies that will disappear in next 5 years

2. Visit the website "Code.org" Complete at least two online courses available on the website. Submit the completion certificate of the same
3. Revise Syllabus for UT-Chapters 1 to 3.

## Elective Maths

## Revise Chapter 1,2,3 and 4 for unit test.

## Sets

1. If $A=\{x: x \in N, x \leq 6\}$ and $B=\left\{x: x \in N, 2<x^{2}<26\right\}$, then $A \cap B$ is equal to :
[a] $\{3,4,5,6\}$
[b] $\{3,4,5\}$
[c] $\{2,3,4,5\}$
[d] $\{4,5,6,7$,
2. The set builder form of $A=\{2,7,12,17,22\}$
[a] $A=\{5 n-3, n \in N, n \leq 5\}$
[b] $\mathrm{A}=\{27-5 \mathrm{n}, \mathrm{n} \in \mathrm{N}, \mathrm{n}<5\}$
[c] $\mathrm{A}=\{5 \mathrm{n}-3, \mathrm{n} \in \mathrm{N}, \mathrm{n}<5\}$
[d] $\mathrm{A}=\{27-5 \mathrm{n}, \mathrm{n} \in \mathrm{N}, \mathrm{n} \geq 5\}$
3. The set builder form of $A=\{-12,-7,-2,3,8,13\}$
[a] $\mathrm{A}=\{5 \mathrm{n}-17, \mathrm{n} \in \mathrm{N}, \mathrm{n} \leq 6\}$
[b] $\mathrm{A}=\{17-5 \mathrm{n}, \mathrm{n} \in \mathrm{N}, \mathrm{n}<6\}$
[c] $\mathrm{A}=\{18-5 \mathrm{n}, \mathrm{n} \in \mathrm{N}, \mathrm{n}<6\}$
[d] $A=\{18-5 n, n \in N, n \geq 6\}$
4. 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
5. 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] $\{3,4,6,7,8,9\}$
6. 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 $\left(A^{\prime} U B\right)$ is equal to
[a] $\{1,2,3,4,5\}$
[b] $\{\mathbf{2}, \mathbf{3}, \mathbf{4}, \mathbf{7}, 8\}$
[c] $\{1,2,4,7,8\}$
[d] $\{2,3,5,6,8\}$
7. If $A=\{2,3,4,5,6\}$, then the number of proper subsets of $A$ is :
[a] 120
[b] 30
[c] 31
[d] 32
8. 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 $\{\mathrm{a}, \mathrm{b}, \mathrm{c}, \mathrm{d}, \mathrm{e}, \mathrm{f}\}$ 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. The value of $a$ and $b$ if $(3 a, 4)$ and ( $2 b,-1$ ) belong to the set $\{(x, y): x-5 y=13\}$
[a] $a=11, b=4$
[b] $a=5 b=11$
[c] $a=11, b=5$
[d] $a=4, b=11$
2. If $f(x)=2 x^{2}-5 x-3$, then the value of $f\{f(2)\}$ is
[a] 18
[b] 22
[c] 72
[d] -72
3. Find the domain of : $f(x)=7 x /\left(x^{2}-2 x-24\right)$
[a] $\{-4,6\}$
[b] R- $\{-4,6\}$
[c] R- $(-4,6\}$
[d] R- $\{-4,6$ )
4. If $A=\left\{x: x^{2}-10 x+21=0\right\} ;, B=\{8,10\} ; C=\{7,10\}$ then $A X(B \cap C)$
[a] $(10,3),(10,7)$
[b] $(6,7),(2,9)$
$[\mathrm{c}](7,10),(3,10)$
[d] $(2,10),(2,10)$
5. Let $A=\{2,3,8\}, B=\{2,3,5\}, C=\{2,5,8,9\}$ then $(A-B) X(B-C)$ is
[a] $\{(1,2),(1,5),(2,5)\}$
$[\mathrm{b}]\{(1,4)\}$
[c] $\{(4,5)\}$
[d] $\{8,3\}$
6. Find the range of : $y=(2 x+3) /(3 x+4)$
[a] R- $\{-3 / 2\}$
[b] R- $\{2 / 3\}$
[c] R- $\{-2 / 3\}$
[d] R- $\{3 / 2\}$
7. Find the domain of : $f(x)=\left(x^{2}-x-3 /\left(2 x^{2}+11 x+9\right)\right.$
[a] $\{1,9 / 2\}$
[b] R- $\{-9 / 2\}$
[c] R- $\{-1,-9 / 2\}$
[d] 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 $R=\{(x, y): y=2 x+1\}$. 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] $\{3,5,7,9,11\}$
[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. Asssertion : If $(2 x+1, x+5 y-2)=(9,18)$, then $x=5$ and $y=3$.

Reason : Two ordered pairs are equal if their corresponding elements are equal.
10. 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 $x=3+2 i$ and $y=3-2 i$, find the value of $5\left(x^{2}+y^{2}\right)+7(x+y)+8 x y$.
[a] 196
[b] 225
[c] 265
[d] 256
2. If $(5 x-8)-(7 y+2) i=17-44 i$, then the value of $x+y$ :
[a] 11
[b] 4
[c] -4
[d] 8
3. The value of $\left(4 i^{6}+14 i^{11}+14 i^{12}+16 i^{17}\right)$
$[\mathrm{a}] 10+6 \mathrm{i}$
[b] $10-6 \mathrm{i}$
[c] $10+2 \mathrm{i}$
[d] $10-2 \mathrm{i}$
4. The value of $(2+8 i) /(1+i)$
$[a](3+4 i)$
[b] $(5+3 i)$
[c] (5-6i)
[d] (3-2i)
5. The number $\frac{(1+i)^{\frac{x}{x}}}{1-i^{5}}$ is equal to :
[a]i
[b] -i
[c] -1
[d]-2
6. If $x-i y=\frac{(1+3 i)^{2}}{2+i}$, then the value $(x+y)$ are :
[a] 2
[b] -2
[c] 6
[d] -6
7. If $x+i y=\frac{(2+i)(1-3 i)}{(1+2 i)(3+i)}$, 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 $(4 x+1)+(6 y-8) i=(-7-2 i)^{2}$ then the value of $x$ and $y$ :
[a] $x=11, y=-6$
$[b] x=11, y=6 \quad[c] x=-11, y=6$
[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 $4 x+i(3 x+4 y)=15+11 i$, 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 $Z=\frac{1}{5+12 i}$, then $|Z|=\frac{1}{17}$

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

## Trigonometry

1. The value of $\sin \left(3735^{\circ}\right)$
[a] $\operatorname{Sin} 45^{\circ}$
[b] $-\operatorname{Sin} 45^{\circ}$
[c] $\operatorname{Sin} 60^{\circ}$
[d] $\operatorname{Sin} 30^{\circ}$
2. The value of $\cos \left(1770^{\circ}\right)$
[a] $\cos 45^{\circ}$
[b] $-\cos 45^{\circ}$
[c] $\cos 60^{\circ}$
[d] $\cos 30^{\circ}$
3. The value of $\cos \left(1680^{\circ}\right)+\sin \left(1290^{\circ}\right)$
[a] 2
[b] -1
[c] 0
[d] 1
4. 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
5. If $\sin A=-5 / 13, A$ lies in 4 th quadrant, then the value of $(\sec A-\tan A)$
[a] $18 / 5$
[b] 17/5
[c] $3 / 2$
[d] $-3 / 2$
6. If A lies in II quadrant and $3 \tan \mathrm{~A}+4=0$, then the value of $(2 \cot \mathrm{~A}-5 \cos \mathrm{~A}+\sin \mathrm{A})$ is
[a] -53//10
[b] -7/10
[c] 7/10
[d] 23/10
7. 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
8. Evaluate : $\cos \mathrm{A}+\sin \left(270^{\circ}+\mathrm{A}\right)-\sin \left(270^{\circ}-\mathrm{A}\right)+\cos \left(180^{\circ}+\mathrm{A}\right)$
[a] -1
[b] 0
[c] 1
[d] none of these
9. $\tan \mathrm{A} \sin \left(\frac{\pi}{2}+A\right) \cos \left(\frac{\pi}{2}-A\right)$ is equal to
[a] 1
[b] 0
[c] $\frac{1}{\sqrt{2}}$
[d] none of these
10. The value of $\frac{\cos (\pi+x) \cos (-x)}{\sin (\pi-x) \cos \left(\frac{\pi}{2}+x\right)}$ is equal to :
[a] $1-\cot ^{2} \mathrm{~A}$
[b] $\cot ^{2} \mathrm{~A}-1$
[c] $1-\operatorname{cosec}^{2} \mathrm{~A}$
[d] $\operatorname{cosec}^{2} \mathrm{~A}-1$
11. 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
12. The value of $\left(3 \cos \frac{\pi}{3} \operatorname{cosec} \frac{\pi}{6}-4 \sin \frac{5 \pi}{6} \tan \frac{\pi}{4}\right) \cos 2 \pi$
[a] 0
[b] -1
[c] 1
[d] $1 / 2$
13. If $\cos \mathrm{A}=4 / 5,0<A<\frac{\pi}{2}$, and $\sin \mathrm{B}=-5 / 13, \pi<A<\frac{3 \pi}{2}$, then the value of $\cos (\mathrm{A}-\mathrm{B})$
[a] 33/65
[b] -33/65
[c] -63/65
[d] 63/65
14. If $x=\sec A-\tan A$ and $y=\operatorname{cosec} A+\cot A$, then the value of $x-y+1+x y$ is
[a] 2
[b] 0
[c] 1
[d] -1
15. If $\cos (a+b)=4 / 5$, and $\sin (a-b)=5 / 13$, then the value of $\tan (2 a)$ is
[a] 24/25
[b] 33/56
[c] 56/33
[d] 25/24
16. If $\sin \mathrm{A}=1 / 2$, then the value of $\sin 3 \mathrm{~A}$ is :
[a] ${ }^{1 / 2}$
[b] $1 / 3$
[c] 0
[d] 1
17. The value of $\cos 68^{\circ}+\cos 52^{\circ}-\cos 8^{\circ}$ is :
[a]2
[b] 3
[c] 0
[d] 1
18. If $\cos (\mathrm{A}-\mathrm{B})=3 \cos (\mathrm{~A}+\mathrm{B})$, then $\cot \mathrm{A} \cdot \operatorname{Cot} \mathrm{B}$ is equal to
[a] 1
[b] 2
[c] 3
[d] -2
[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 $A$.
19. Assertion : Tan8A- $\tan 6 \mathrm{~A}+\tan 2 \mathrm{~A}=\operatorname{Tan} 8 \mathrm{ATan} 6 \mathrm{ATan} 2 \mathrm{~A}$

Reason $: \tan (A+B)=\frac{\tan A-\tan B}{1-\tan A \tan B}$
20. 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 $\mathrm{m} / \mathrm{r}$ radians at the centre.

## 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-cosx)
[b] (1+cosx)
[c] $(1+\cos 2 x)$
[d] (1-cos2x)
[iii] If $\cot x=-1 / \sqrt{3}$ and $x$ lies in $2^{\text {nd }}$ quadrant the value of $(1+\sec x)$
[a] 1
[b] 3
[c] -1
[d] 0
[iv] The degree measures of $\left(\frac{8 \pi}{9}\right)^{c}$ 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] $3-\sqrt{2}$
3. Draw the graph of the function $\mathrm{f}(\mathrm{x})=\left\{\begin{array}{lll}3-\mathrm{x}, & \text { if } & \mathrm{x}>1 \\ 1, & \text { if } & \mathrm{x}=1 \\ 2 \mathrm{x}, & \text { if } & \mathrm{x}<1\end{array}\right\}$
4. Represent the given complex number on Arganda plane $: \frac{2+i}{(1+i)(1-2 i)}$
5. Draw the graph of cosx such that the value of $x$ lies between $-180^{\circ}$ to $180^{\circ}$

## Physics

- Revise chapter 2,3 and 4 for UT.
- Complete all NCERT examples, problems and NCERT exemplar questions and answers of chapters completed in class, in summer 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 attached herewith in summer homework notebook.


## Physics Worksheet

## Multiple choice questions

1. A person sitting in a moving car is at rest with respect to
(1) a tree on the ground
(2) a cyclist on the road
(3) a building on the roadside
(4) the car
2. The motion of the wheel of a cycle is
(1) rotatory
(2) rectilinear
(3) translatory and rotatory
(4) None of these
3. 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,
(1) 110 m
(2) $20 \sqrt{5} \mathrm{~m}$
(3) 75 m
(4) 50 m
4. The numerical ratio of displacement to distance for a moving object is
(1) always less than 1
(2) always equal to 1
(3) always more than 1
(4) equal or less than 1
5. 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,
(1) $160 \mathrm{~m} ; 160 \mathrm{~m}$
(2) 160 m ; $80 \pi \mathrm{~m}$
(3) $0 \mathrm{~m} ; 80 \pi \mathrm{~m}$
(4) $160 \mathrm{~m} ; 160 \pi \mathrm{~m}$
6. In which of the following cases of motions, the distance moved and the magnitude of displacement are equal ?
(1) If the car is moving on straight road
(2) If the car is moving in circular path
(3) The pendulum is moving to and fro
(4) The earth is revolving around the Sun
7. A body moved from one end to another end along a curved path of a quarter circle. The ratio of distance to displacement is
(1) $\frac{\pi}{2 \sqrt{2}}$
(2) $\frac{2 \sqrt{2}}{\pi}$
(3) $\frac{\sqrt{2}}{\pi}$
(4) $\frac{\pi}{\sqrt{2}}$
8. A ball is thrown up with a certain velocity. It attains a height of 40 m and comes back to the thrower, then
(1) total distance covered by it is 40 m
(2) total displacement covered by it is 80 m
(3) total displacement is zero
(4) total distance covered by it is zero
9. A body moves on three quarters of a circle of radius r. The displacement and distance travelled by it are
(1) displacement $=r$, distance $=3 \mathrm{r}$
(2) displacement $=\sqrt{2} r$, distance $=\frac{3 \pi r}{2}$
(3) distance $=2 r$, displacement $=\frac{3 \pi r}{2}$
(4) displacement $=0$, distance $=\frac{3 \pi r}{2}$
10. 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) $=1$
(2) $\geq 1$
(3) $\leq 1$
(4) $<1$
11. 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
(1) 0
(2) $8 \pi \mathrm{R}$
(3) $\sqrt{3 R}$
(4) $\frac{p}{R}$
12. A particle is travelling with a constant speed. This means that
(1) Its position remains constant as time passes
(2) It covers equal distances is equal time intervals
(3) Its acceleration is zero
(4) It does not change its direction of motion
13. A boy runs for 10 min at a uniform speed of $9 \mathrm{~km} /$ h. At what speed should he run for the next 20 min so that the average speed comes to $12 \mathrm{~km} / \mathrm{h}$ ?
(1) $13.5 \mathrm{~km} / \mathrm{h}$
(2) $10.2 \mathrm{~km} / \mathrm{h}$
(3) $8.2 \mathrm{~km} / \mathrm{h}$
(4) $7.72 \mathrm{~km} / \mathrm{h}$
14. A car moves at a speed of $60 \mathrm{~km} / \mathrm{hr}$ for 50 km and $80 \mathrm{~km} / \mathrm{hr}$ for the next 50 km . What is average speed (in $\mathrm{km} / \mathrm{hr}$ ) 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 $30 \mathrm{~km} / \mathrm{h}$, then it travels in opposite direction with same distance and reaches at original station at a constant velocity of $45 \mathrm{~km} /$ h. What is the average speed of train ?
(1) $36 \mathrm{~km} / \mathrm{h}$
(2) $10 \mathrm{~km} / \mathrm{h}$
(3) 0
(4) $75 \mathrm{~km} / \mathrm{h}$
16. An object travels 16 m in 4 seconds, then another 16 m in 2 seconds. Its average speed is
(1) $6 \mathrm{~m} / \mathrm{sec}$
(2) $5 \mathrm{~m} / \mathrm{sec}$
(3) $8 \mathrm{~m} / \mathrm{sec}$
(4) $5.3 \mathrm{~m} / \mathrm{sec}$
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 $40 \mathrm{~km} /$ hr and returns to A at a speed of $30 \mathrm{~km} / \mathrm{hr}$. The average velocity (in $\mathrm{km} / \mathrm{hr}$ ) 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) $\mathrm{v}=\frac{2 \mathrm{v}_{1} \mathrm{v}_{2}}{\mathrm{v}_{1}+\mathrm{v}_{2}}$
(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 $10 \mathrm{~km} / \mathrm{hr}$, next $\frac{1}{3}$ rd with velocity 20 $\mathrm{km} / \mathrm{hr}$ and the last $\frac{1}{3} \mathrm{rd}$ with velocity $60 \mathrm{~km} / \mathrm{hr}$. What is the average velocity of the car in the whole journey?
(1) $4 \mathrm{~km} / \mathrm{hr}$
(2) $6 \mathrm{~km} / \mathrm{hr}$
(3) $12 \mathrm{~km} / \mathrm{hr}$
(4) $18 \mathrm{~km} / \mathrm{hr}$
21. A cyclist moving on a circular track of radius 40 m completes half revolution in 40 seconds. Its average velocity is
(1) $2 \pi \mathrm{~m} / \mathrm{sec}$
(2) $2 \mathrm{~m} / \mathrm{sec}$
(3) $4 \pi \mathrm{~m} / \mathrm{sec}$
(4) $4 \mathrm{~m} / \mathrm{sec}$
22. A quantity has a value of $-6.0 \mathrm{~m} / \mathrm{s}$. 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 $12 \mathrm{~m} \times 5 \mathrm{~m}$ 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 $80 \mathrm{~km} / \mathrm{hr}$ to 60 $\mathrm{km} / \mathrm{hr}$ in 5 sec . The acceleration of the bus is
(1) $2.1 \mathrm{~m} / \mathrm{s}^{2}$
(2) $-3.4 \mathrm{~m} / \mathrm{s}^{2}$
(3) $-1.1 \mathrm{~m} / \mathrm{s}^{2}$
(4) $3.2 \mathrm{~m} / \mathrm{s}^{2}$
27. The CGS unit of acceleration is
(1) $\mathrm{m} / \mathrm{s}^{2}$
(2) $\mathrm{m} / \mathrm{s}$
(3) $\mathrm{cm} / \mathrm{min}^{2}$ (4) $\mathrm{cm} / \mathrm{s}^{2}$
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 $20 \mathrm{~m} / \mathrm{s}$ in first 2 sec and $40 \mathrm{~m} / \mathrm{s}$ in first 4 sec . The initial velocity of the body is
(1) $40 \mathrm{~m} / \mathrm{s}$
(2) $20 \mathrm{~m} / \mathrm{s}$
(3) $10 \mathrm{~m} / \mathrm{s}$
(4) $0 \mathrm{~m} / \mathrm{s}$
35. A car starts from rest and moves along the $x$-axis with constant acceleration $5 \mathrm{~m} \mathrm{~s}^{-2}$ 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 $43.2 \mathrm{~km} / \mathrm{hr}$ applies the brakes giving a deceleration of $12 \mathrm{~m} / \mathrm{s}^{2}$ 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 $150 \mathrm{~m} / \mathrm{s}$ 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) $15 \times 10^{4} \mathrm{~m} / \mathrm{s}^{2}$
(2) $7.5 \times 10^{4} \mathrm{~m} / \mathrm{s}^{2}$
(3) $3.75 \times 10^{4} \mathrm{~m} / \mathrm{s}^{2}$
(4) $30 \times 10^{4} \mathrm{~m} / \mathrm{s}^{2}$
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 $\mathrm{m} / \mathrm{s}$ ) 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) $\mathrm{S}_{1}=\mathrm{S}_{2} / 3$
(3) $\mathrm{S}_{1}=\mathrm{S}_{2} / 2$
(4) $\mathrm{S}_{1}=\mathrm{S}_{2} / 4$
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) $40 \mathrm{~cm} / \mathrm{sec}$
(2) $20 \mathrm{~cm} / \mathrm{sec}$
(3) $10 \mathrm{~cm} / \mathrm{sec}$
(4) $5 \mathrm{~cm} / \mathrm{sec}$
42. A body moving along a straight line at $20 \mathrm{~m} / \mathrm{sec}$ undergoes an acceleration of $4 \mathrm{~m} / \mathrm{sec}^{2}$. After two seconds its speed will be :
(1) $12 \mathrm{~m} / \mathrm{sec}$
(2) $28 \mathrm{~m} / \mathrm{sec}$
(3) $72 \mathrm{~m} / \mathrm{sec}$
(4) $20 \mathrm{~m} / \mathrm{sec}$
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 2 s . It then decelerates uniformly for 3 s and stops. If deceleration is $4 \mathrm{~ms}^{-2}$, the acceleration of the body is $\qquad$ $\mathrm{ms}^{-2}$.
(1) 10
(2) 8.7
(3) 4
(4) 6
45. In the equation of motion : $s=a t+b t^{2}$, the units of a and b are respectively.
(1) $\mathrm{m} / \mathrm{s}^{2}, \mathrm{~m} / \mathrm{s}^{2}$
(2) $\mathrm{m} / \mathrm{s}, \mathrm{m} / \mathrm{s}^{2}$
(3) $\mathrm{m} / \mathrm{s}^{2}, \mathrm{~m} / \mathrm{s}^{3}$
(4) $\mathrm{m} / \mathrm{s}, \mathrm{m} / \mathrm{s}^{3}$
46. A body travels a distance of 20 m in the 7 th second and 24 m in 9 th second. The distance travelled by it in the 15 th 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 $\mathrm{n}^{\text {th }} \mathrm{sec}$. to that in n sec . is
(1) $\frac{n^{2}}{2 n+1}$
(2) $\frac{2 n-1}{n^{2}}$
(3) $\frac{n^{2}}{2 n-1}$
(4) $\frac{2 n+1}{n^{2}}$
48. The initial velocity of a particle is $10 \mathrm{~m} / \mathrm{sec}$ and its retardation is $2 \mathrm{~m} / \mathrm{sec}^{2}$. The distance moved by the particle in 5 th 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 $t=4 \mathrm{~s}$, it travels a distance of ( $\mathrm{g}=9.8 \mathrm{~m} / \mathrm{s}^{2}$ )
(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 $\left(\mathrm{g}=9.8 \mathrm{~m} / \mathrm{s}^{2}\right)$
(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 4 th second and a distance $S_{2}$ in the 6th second. The ratio $\mathrm{S}_{1} / \mathrm{S}_{2}$ is
(1) $2 / 3$
(2) $4 / 9$
(3) $6 / 11$
(4) $7 / 11$
52. A body with an initial velocity of $3 \mathrm{~m} / \mathrm{s}$ moves with an acceleration of $2 \mathrm{~m} / \mathrm{s}^{2}$, then the distance travelled in the 4 th 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) $\frac{2 h}{v}$
(2) $\sqrt{\frac{2 h}{v}}+\frac{h}{g}$
(3) $\sqrt{\frac{2 h}{g}}+\frac{h}{v}$
(4) $\sqrt{\frac{h}{2 g}}+\frac{2 h}{v}$
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) $\sqrt{\mathrm{h}_{1}}: \sqrt{\mathrm{h}_{2}}$
(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 3 u . The height of the tower is
(1) $\frac{3 u^{2}}{g}$
(2) $\frac{4 u^{2}}{g}$
(3) $\frac{6 u^{2}}{g}$
(4) $\frac{9 u^{2}}{g}$
56. Acceleration of a body projected upwards with a certain velocity is
(1) $9.8 \mathrm{~m} / \mathrm{s}^{2}$
(2) $-9.8 \mathrm{~m} / \mathrm{s}^{2}$
(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 $10 \mathrm{~m} / \mathrm{sec}$. 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 $49 \mathrm{~m} / \mathrm{s}$. The maximum height to which it rises and the total time it takes to return to the surface of the earth are respectively ( $\mathrm{g}=9.8 \mathrm{~m} / \mathrm{s}^{2}$ ),
(1) $100 \mathrm{~m} ; 4 \mathrm{~s}$
(2) $110.5 \mathrm{~m} ; 6 \mathrm{~s}$
(3) 150 m ; 5 s
(4) 122.5 m ; 10 s
61. A stone is thrown vertically upward with an initial velocity of $40 \mathrm{~m} / \mathrm{s}$. Taking $\mathrm{g}=10 \mathrm{~m} / \mathrm{s}^{2}$, what is the net displacement and the total distance covered by the stone when it returns to earth ?
(1) $0 \mathrm{~m} ; 150 \mathrm{~m}$
(2) $0 \mathrm{~m} ; 160 \mathrm{~m}$
(3) 75 m ; 150 m
(4) $80 \mathrm{~m} ; 160 \mathrm{~m}$
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 $25 \mathrm{~m} / \mathrm{s}$. When and where the two stones will meet? (Take, $g=10 \mathrm{~m} / \mathrm{s}^{2}$ )
(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 $35 \mathrm{~m} / \mathrm{s}$. Taking $\mathrm{g}=10 \mathrm{~m} / \mathrm{s}^{2}$, the velocity of the object 5 s later is
(1) $15 \mathrm{~m} / \mathrm{s}$ down
(2) $7.0 \mathrm{~m} / \mathrm{s} \mathrm{up}$
(3) $15 \mathrm{~m} / \mathrm{s}$ up
(4) $85 \mathrm{~m} / \mathrm{s}$ down
64. A stone is released from a balloon that is descending at a constant speed of $10 \mathrm{~m} / \mathrm{s}$. Neglecting air resistance, after 20 s the speed of the stone is ( $\mathrm{g}=9.8 \mathrm{~m} / \mathrm{s}^{2}$ )
(1) $2160 \mathrm{~m} / \mathrm{s}$
(2) $1760 \mathrm{~m} / \mathrm{s}$
(3) $206 \mathrm{~m} / \mathrm{s}$
(4) $196 \mathrm{~m} / \mathrm{s}$
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, $\mathrm{g}=10 \mathrm{~ms}^{-2}$; speed of sound $=340 \mathrm{~m} / \mathrm{s}$.
(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) $\mathrm{m}^{2}$
(2) m
(3) $\mathrm{m}^{3}$
(4) $\mathrm{m} \mathrm{s}^{-1}$
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) $1.33 \mathrm{~m} / \mathrm{s}^{2} ; 150 \mathrm{~m}$
(2) $0 \mathrm{~m} / \mathrm{s}^{2}$; 150 m
(3) $1.33 \mathrm{~m} / \mathrm{s}^{2}$; 300 m
(4) $0 \mathrm{~m} / \mathrm{s}^{2} ; 300 \mathrm{~m}$
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?
(1)

(2)

(3)

(4)

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) $2 \mathrm{~ms}^{-1}$
(2) $4 \mathrm{~ms}^{-1}$
(3) $6 \mathrm{~ms}^{-1}$
(4) $8 \mathrm{~ms}^{-1}$
86. Suppose a boy is enjoying a ride on a merry-goround which is moving with a constant speed of 10 $\mathrm{m} \mathrm{s}^{-1}$. 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 m . If it makes 30 revolutions/sec., then the linear speed (in $\mathrm{m} / \mathrm{s}$ ) of a point on its circumference is
(1) $30 \pi$
(2) $\pi$
(3) $60 \pi$
(4) $\pi / 2$
90. The angular velocity (in 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 $100 \mathrm{~km} / \mathrm{hr}$. The change in velocity (in $\mathrm{km} / \mathrm{hr}$ ) 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) $\pi / 3600 \mathrm{rad} / \mathrm{s}$
(2) $\pi / 1800 \mathrm{rad} / \mathrm{s}$
(3) $\pi / 7200 \mathrm{rad} / \mathrm{s}$
(4) $\pi / 900 \mathrm{rad} / \mathrm{s}$
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) $340 \mathrm{~cm} / \mathrm{s}^{2}$
(2) $34 \mathrm{~cm} / \mathrm{s}^{2}$
(3) $3.4 \mathrm{~cm} / \mathrm{s}^{2}$
(4) $0.34 \mathrm{~cm} / \mathrm{s}^{2}$
98. The acceleration of a point on the rim of flywheel 1 m in diameter, if it makes 1200 revolutions per minute is
(1) $8 \pi^{2} \mathrm{~m} / \mathrm{s}^{2}$
(2) $80 \pi^{2} \mathrm{~m} / \mathrm{s}^{2}$
(3) $800 \pi^{2} \mathrm{~m} / \mathrm{s}^{2}$
(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) $\frac{\pi r}{2 T}$
(3) $\frac{2 \pi r}{T}$
(4) $\frac{2 \pi r}{(T / 2)}$
