SURAJ SCHOOL

Delhi Road, Rewari - 123106

A Global Senior Secondary CBSE English Medium School

www.surajschoolrewari.com rewari@surajschool.com 9992306133, 01274-240066

Summer Holiday Homework

(2024-25)

CLASS –XI

Non-Medical

Sun shines on your skin and mine
until it sets way after nine.
Memories made with a cold drink in hand.
Moments to cherish with feet in the sand.
Everyone laughing, smiles on every face.
Remember the moments, those were the days.
Turn up the music, sing it out loud.
Indigo skies, no sign of a cloud.
Mutter the words that no one will know.
Everlasting memories; where does time go?

ENJOY YOUR SUMMER VACATIONS!!

प्रकाशमय कल के लिए

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HOLIDAY HOMEWORK (2024-25)

CLASS –XII

"Genius is one percent inspiration and ninety-nine percent perspiration. As a result, a genius is often a talented person who has simply done all of his/her work on time".

Dear parent

As we all know that every year we have a summer break in our school, this is a time when every kid plans a holiday with their parents to visit their grandparents or a new city or country. Even though there are many good things about the holidays, it always comes with holiday homework. It is the task that is assigned to students to be completed during the holiday. This is intended to improve the skills of students and enhance their capabilities. Keeping this in mind, holiday home work has been prepared so that along with the fun, continuity with academics is also maintained.

Note: Kindly go through the instructions carefully and do the needful accordingly.

a) Entire Homework is to be done in the concerned subject notebook.
b) Entire holiday homework (Subject wise) would be **evaluated for Term-I Internal Assessment out of 10 marks**
c) Well labelled Holiday homework to be submitted to the concerned Subject Teacher on **Wednesday July 05, 2024.**

Wishing you all a very Happy Summer Break!!

English

A) Read the chapters: -

1) The Portrait of a Lady
2) We're not afraid to die if we can all be together
3) Discovery Tut: The saga continues

Identify the themes of all the chapters and write it in your own words (Word Limit: 100 words)

B) Read the Chapter, and find out the meanings of difficult words: -

1) The Adventure
2) Silk Road

Identify the themes of all the chapters and write it in your own words (Word Limit: 100 words)

C) Read the poems

1) A Photograph
2) The laburnum trees
3) The Voice of the Rain
4) Childhood
5) Father to son

Identify the themes of all the poems and write it in your own words (Word Limit: 100 words)

D) Write a speech on: -

1) Social Media: Boon Or Curse
2) Importance Of Reading
3) The Impact of Technology on Society

Chemistry

1. Complete your investigatory project (hand written) which you have been already allotted by your subject teacher.
2. Make a list of all the formulae related to Chapter 1 (some basic concept of chemistry) Chapter 2 (Atomic structures) Chapter 3 (periodic classification) in your notebook.
3. Solve all the problems from NCERT Example books (Chapter 1,2,3,)
4. Make a PPT on Bohrs Model of Atom.

MUSIC

1. Write and learn definitions of Swar, Saptak, Varn, Alankar, Graam, & Aalap..
2. Write andlearn eakgun and dugan of Rupak tall, Jhaptall, & Dhamar tall..
3. Write and learn the biography of Fayaz khan..

MATHEMATICS

Q.1: How many elements are there in the complement of set A?
A. 0
B. 1
C. All the elements of A
D. None of these

Q2: Empty set is a _____.
A. Infinite set
B. Finite set
C. Unknown set
D. Universal set

Q.3: The number of elements in the Power set P(S) of the set S = {1, 2, 3} is:
A. 4
B. 8
C. 2
D. None of these

Q.4: Order of the power set P(A) of a set A of order n is equal to:
A. n
B. 2n
C. 2n
D. n2

Q.5: Which of the following two sets are equal?
A. A = {1, 2} and B = {1}
B. A = {1, 2} and B = {1, 2, 3}
C. A = {1, 2, 3} and B = {2, 1, 3}
D. A = {1, 2, 4} and B = {1, 2, 3

(6) Value of I (iota) is _____
a) -1
b) 1
c) (-1)1/2
d) (-1)1/4

(7) n z=4+i, what is the real part?
a) 4
b) i
c) 1
d) 4+i

(8) In z=4+i, what is imaginary part?
a) 4
b) i
c) 1
d) 4+i

(9) If z1 = 2+3i and z2 = 5+2i, then find sum of two complex numbers.
a) 4+8i
b) 3-i
c) 7+5i
d) 7-5i

(10) Write of the following sets in set-builder form:
(i) {2, 4, 6, 8, ….) (ii) {6, 10, 14, 18)

11. Rewrite the following sets by listing all elements (roster form):
(i) Set of all the letters in the word 'ALGBERA'.
(ii) Set of all + ve integers which are common factors of 30 and 45.

12. Which the following sets are null sets any why?
(i) A={0} i.e., set having zero as its only elements.
(ii) B=$\{x : x + 3 = 3\}$

13. Which the following sets are equal sets?
(i) $\{a, b, c\}, \{c, a, b, a\}, \{b, a, c, b\}, \{c, a, b, c, c\}$.
(ii) $\{1, 2, 3\}, \{x : x^2 - 2x + 1 = 0\}, \{3, 2, 1\}, \{x : x^3 - 6x^2 + 11x - 6 = 0\}$.

14. Which of the following are sets? Justify your answer.
(i) The collection of all prime numbers.
(ii) The collection of good hockey players in India.

15. Let A, B and C be three sets. If A ⊂ B and B ∈ C, is it true that A ∈ C? if not give an example.

16. How many subsets can be formed from the following set:

(i) { } (ii) {1} (iii) {2, 3, 9} (iv) {1, 2, 3, …,n}.

17. Prove that if A⊆ ∅, then A=∅.

18. Write down all the subsets of

(i) $\left\{\frac{1}{2}, 1, \pi\right\}$ (ii) {a, b, c, d}.

19. For any two sets A and B, Prove that: P(A) = P(B) ⇒ A = B.

20. Find the union of each of the following pairs of sets:

(i) $A = \{a, e, i, o, u\}$, $B = \{a, i, u\}$

21. If A= $\{a, b, c, d, e\}$ and B= $\{d, e, f, g\}$; find (A – B) ∪ (B – A).

22. If A = $\{x : x = 3n,\ n \in Z\}$ and B = $\{x : x = 4n,\ n \in Z\}$, then find A ∩ B.

23. If A = {1, 3, 5, 9}, B = {3, 7, 8}, C = {2, 3, 4, 8}, verify that $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$.

24. Let U = {1, 2, 3, 4, 5, 6, 7, 8, 9}, A = {1, 2, 3, 4}, B = {2, 4, 6, 8}, C = {3, 4, 5, 6} find :

(i) $(A \cap C)'$ (ii) $(B \cap C)'$ (iii) $(A - C)'$

25. If A={1, 2, 3, B={4}, C={5}, then verify that

(i) $A \times (B \cup C) = (A \times B) \cup (A \times C)$

(ii) $A \times (B \cap C) = (A \times B) \cap (A \times C)$

26. A and B are two sets given in such a way that (A × B) contains 6 elements. If there elements of A × B be (1, 3), (2, 5) and (3, 3). Find its remaining elements.

27. Find x and y, if

(i) $2x, x + y = (6, 2)$ (ii) $x + 1, y - 2) = (3, 1)$

28. If A={1, 3, 5} and B={2, 3}, then show that $A \times B \neq B \times A$.

29. If A={1, 4}, B={2, 3, 6} and C={2, 3, 7}, then verify that :

(i) $A \times (B \cup C) = (A \times B) \cup (A \times C)$

(ii) $A \times (B \cap C) = (A \times B) \cap (A \times C)$

30. Let A={1, 2, 3, ….., 25} and *R* is relation "is one fourth of " in A. Write *R* as a subset of A × A. Also find the domain and range of *R*.

31. Determine the domain and range of the following relations:

(i) $\{(x, y): x \in \mathbf{N}, y = \mathbf{N} \text{ and } x + y = 10\}$

(ii) $\{(x, y): x \in \mathbf{N}, x < 5, y = 3\}$

32. In the set of integers, let a relation *R* be defined as *a R b* if and only if $a - b$ is even. Prove that

(i) $(a, a) \in R$ for all $a \in \mathbf{Z}$

(ii) $(a, b) \in R \Rightarrow (b, a) \in R$ for all $a,\ b \in \mathbf{Z}$

(i) $y = 3x^4 - 5x^2 + 6$ (ii) $y = 2x^3 + 5x$

33. Write the range of the following function:

(i) $\sqrt{x - 5}, x \geq 5$ (ii) $\frac{k-x}{x-k}, x \neq k$

34. If $f(x) = ax + b$, where *a* and *b* are integers, $f(-1) = -5$ and $f(3) = 3$, find *a* and *b*.

35. Find the domain and range of the following function:

(i) $y = \frac{x^2-36}{x-6}, x \neq 6$ (ii) $y = \frac{2x-4}{2-x}, x \neq 2$

36. Define the sum and difference of the identity function and the reciprocal function?

37.Find $f+g,\ f-g,\ f.g$ and $\frac{f}{g}$ for the following function if f: **R** → **R** and g: **R** → **R**

(i) $f(x)=x^2,\ g(x)=2x+1$ (ii) $f(x)=x^2-x,\ g(x)=x+5$

38. Let f and g be two real valued functions defined by $f(x)=\frac{1}{x+4}$ and $g(x)=\sqrt{x+1}$. Find

(i) $f+g$ (ii) $f-g$ (iii) fg (iv) $\frac{f}{g}$

39. Define the product of the identity function and the module function.

40. If A={1, -1}, then find A × A × A.

41.If $f(x)=x^2$, find $\frac{f(1\cdot1)-f(1)}{1\cdot1-1}$

42. If A={1, 3, 5} and B={2, 4}, list the elements of R, if R= $\{(x,y): x,y) : x,y \in$ A × B and $x>y\}$.

43. If A is a set such that *n*(A)=3 and B={3, 4, 5}, then what is number of elements in A × B ?

44. If $f(x)=\frac{5x+3}{4x-5}, x\neq\frac{5}{4}$, then find $f\{f(x)\}$.

45. Find the range of the function $f(x)=\frac{x}{|x|}$.

46. If $2f(x)-3f\left(\frac{1}{x}\right)=x^2(x\neq0)$, then find $f(2)$.

47. Write the range of $f(x)=\frac{1}{1-2\cos x}$.

48. Let X = {1, 2, 3, 4, 5} and Y = {1, 2, 5, 6, 7, 9, 10, 11, 12, 13, 14}. Write the function from X to Y defined by $f(x)=2x+3$.

49. Find the domain of the function $(x)=\sqrt{\frac{x-2}{x+2}}+\sqrt{\frac{1-x}{1+x}}$.

50. A function $'f'$ on the set **R** of real number is defined as $f(x)=\frac{2x+1}{x-1}$. Find

(i) The domain of f (ii) The range of f

51. If f: R → R is defined by $f(x)=2^x$, then find (i) range of f (ii) x such that $f(x)=1$. Also, prove that $f(x+y)=f(x)\,f(y)$.

52. Are the following relation function? Justify your answer

(i) $R_1=\{(x,|x|) : x$ is a real number$\}$ (ii) $R_2=\{(x,x^2) : x$ is a positive number$\}$

Exercise - II (Previous Year Questions) AIPMT/NEET

AIPMT 2006

1. A car runs at a constant speed on a circular track of radius 100 m, taking 62.8 seconds for every circular lap. The average velocity and average speed for each circular lap respectively is :-
(1) 0,0 (2) 0, 10 m/s
(3) 10 m/s, 10 m/s (4) 10 m/s, 0

2. A particle moves along a straight line OX. At a time t (in seconds) the distance x (in metres) of the particle from O is given by $x = 40 + 12t - t^3$. How long would the particle travel before coming to rest ?
(1) 24 m (2) 40 m (3) 56 m (4) 16 m

3. Two bodies, A (of mass 1 kg) and B (of mass 3 kg), are dropped from heights of 16 m and 25 m respectively. The ratio of the time taken by them to reach the ground is :-
(1) $\frac{5}{4}$ (2) $\frac{12}{5}$ (3) $\frac{5}{12}$ (4) $\frac{4}{5}$

4. For angles of projection of a projectile $(45° - \theta)$ and $(45° + \theta)$, the horizontal ranges described by the projectile are in the ratio of :-
(1) 1 : 1 (2) 2 : 3 (3) 1 : 2 (4) 2 : 1

AIPMT 2007

5. A car moves from X to Y with a uniform speed v_u and returns to X with a uniform speed v_d. The average speed for this round trip is :-
(1) $\frac{v_u + v_d}{2}$ (2) $\frac{2v_d v_u}{v_d + v_u}$
(3) $\sqrt{v_u v_d}$ (4) $\frac{v_d v_u}{v_d + v_u}$

6. A particle moving along x-axis has acceleration f, at time t, given by $f = f_o\left(1 - \frac{t}{T}\right)$, where f_o and T are constants. The particle at t = 0 has zero velocity. At the instant when f = 0, the particle's velocity is :-
(1) $\frac{1}{2} f_o T$ (2) $f_o T$ (3) $\frac{1}{2} f_o T^2$ (4) $f_o T^2$

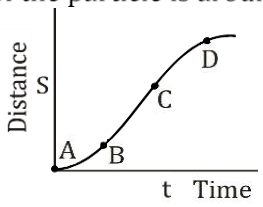
7. The position x of a particle with respect to time t along x-axis is given by $x = 9t^2 - t^3$ where x is in metres and t in seconds. What will be the position of this particle when it achieves maximum speed along the + x direction ?
(1) 24 m (2) 32 m (3) 54 m (4) 81 m

8. The distance travelled by a particle starting from rest and moving with an acceleration $\frac{4}{3}\text{m/s}^2$, in the third second is :-
(1) $\frac{10}{3}$m (2) $\frac{19}{3}$m (3) 6m (4) 4m

AIPMT 2008

9. A particle moves in a straight line with a constant acceleration. It changes its velocity from 10 m/s to 20 m/s while passing through a distance of 135 m in t seconds. The value of t is :-
(1) 12 (2) 9 (3) 10 (4) 1.8

10. A particle shows distance-time curve as given in this figure. The maximum instantaneous velocity of the particle is around the point :-



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

11. A particle of mass m is projected with velocity v making an angle of 45° with the horizontal. When the particle lands on the ground level, the magnitude of the change in its momentum will be:-
(1) $mv\sqrt{2}$ (2) zero (3) 2 mv (4) $mv/\sqrt{2}$

AIPMT 2009

12. A body starting from rest is moving under a constant acceleration up to 20 sec. If it moves S_1 distance in first 10 sec., and S_2 distance in next 10 sec. then S_2 will be equal to :
(1) S_1 (2) $2S_1$ (3) $3S_1$ (4) $4S_1$

13. A bus is moving with a speed of 10 m/s on a straight road. A scooterist wishes to overtake the bus in 100 s. If the bus is at a distance of 1 km from the scooterist, with what speed should the scooterist chase the bus ?
(1) 10 m/s (2) 20 m/s
(3) 40 m/s (4) 25 m/s

AIPMT (Pre) 2010

14. A particle moves a distance x in time t according to equation $x = (t + 5)^{-1}$. The acceleration of particle is proportional to :-

(1) $(\text{velocity})^{2/3}$ (2) $(\text{velocity})^{3/2}$

(3) $(\text{distance})^{2}$ (4) $(\text{distance})^{-2}$

15. A ball is dropped from a high rise platform at t = 0 starting from rest. After 6 seconds another ball is thrown downwards from the same platform with a speed v. The two balls meet at t = 18s.What is the value of v ? (take g = 10 m/s^2)

(1) 60 m/s (2) 75 m/s

(3) 55 m/s (4) 40m/s

16. A particle has initial velocity $\left(3\hat{i}+4\hat{j}\right)$ and has acceleration $\left(0.4\hat{i}+0.3\hat{j}\right)$. Its speed after 10s is :-

(1) 10 units (2) 7 units

(3) $7\sqrt{2}$ units (4) 8.5 units

AIPMT (Mains) 2010

17. The speed of a projectile at its maximum height is half of its initial speed. The angle of projection is :-

(1) 15° (2) 30° (3) 45° (4) 60°

AIPMT (Pre) 2011

18. A boy standing at the top of a tower of 20 m height drops a stone. Assuming g = 10 m/s^2, the velocity with which it hits the ground is :-

(1) 10.0 m/s (2) 20.0 m/s

(3) 40.0 m/s (4) 5.0 m/s

19. A body is moving with velocity 30 m/s towards east. After 10 seconds its velocity becomes 40 m/s towards north. The average acceleration of the body is :-

(1) 1 m/s^2 (2) 7 m/s^2

(3) $\sqrt{7}$ m/s^2 (4) 5 m/s^2

20. A missile is fired for maximum range with an initial velocity of 20 m/s. If g = 10 m/s^2, the range of the missile is :-

(1) 40 m (2) 50 m

(3) 60 m (4) 20 m

AIPMT (Mains) 2011

21. A particle covers half of its total distance with speed v_1 and the rest half distance with speed v_2. Its average speed during the complete journey is:-

(1) $\frac{v_1+v_2}{2}$ (2) $\frac{v_1v_2}{v_1+v_2}$

(3) $\frac{2v_1v_2}{v_1+v_2}$ (4) $\frac{v_1^2v_2^2}{v_1^2+v_2^2}$

22. A projectile is fired at an angle of 45° with the horizontal. Elevation angle of the projectile at its highest point as seen from the point of projection, is :

(1) 45° (2) 60°

(3) $\tan^{-1}\frac{1}{2}$ (4) $\tan^{-1}\left(\frac{\sqrt{3}}{2}\right)$

AIPMT (Pre) 2012

23. The motion of a particle along a straight line is described by equation $x = 8 + 12t - t^3$ where x is in metres and t in seconds. The retardation of the particle when its velocity becomes zero is :-

(1) 6 m/s^2 (2) 12 m/s^2

(3) 24 m/s^2 (4) zero

24. The horizontal range and the maximum height of a projectile are equal. The angle of projection of the projectile is :-

(1) $\theta = \tan^{-1}(2)$ (2) $\theta = 45°$

(3) $\theta = \tan^{-1}\left(\frac{1}{4}\right)$ (4) $\theta = \tan^{-1}(4)$

25. A particle has initial velocity $\left(2\hat{i}+3\hat{j}\right)$ and acceleration $\left(0.3\hat{i}+0.2\hat{j}\right)$. The magnitude of velocity after 10 seconds will be :

(1) 5 units (2) 9 units

(3) $9\sqrt{2}$ units (4) $5\sqrt{2}$ units

AIPMT (Mains) 2012

26. A stone is dropped from a height h. It hits the ground with a certain momentum P. If the same stone is dropped from a height 100% more than the previous height, the momentum when it hits the ground will change by :-

(1) 200 % (2) 100 % (3) 68% (4) 41%

NEET-UG 2013

27. A stone falls freely under gravity. It covers distances h_1, h_2 and h_3 in the first 5 seconds, the next 5 seconds and the next 5 seconds respectively. The relation between h_1, h_2 and h_3 is :-

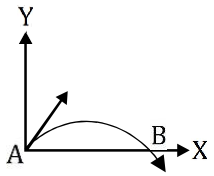
(1) $h_1 = h_2 = h_3$

(2) $h_1 = 2h_2 = 3h_3$

(3) $h_1 = \frac{h_2}{3} = \frac{h_3}{5}$

(4) $h_2 = 3h_1$ and $h_3 = 3h_2$

28. The velocity of a projectile at the initial point A is $(2\hat{i}+3\hat{j})$ m/s. Its velocity (in m/s) at point B is :-



(1) $2\hat{i}+3\hat{j}$ (2) $-2\hat{i}-3\hat{j}$

(3) $-2\hat{i}+3\hat{j}$ (4) $2\hat{i}-3\hat{j}$

AIPMT 2014

29. A projectile is fired from the surface of the earth with a velocity of 5 m/s and angle θ with the horizontal. Another projectile fired from another planet with a velocity of 3 m/s at the same angle follows a trajectory which is identical with the trajectory of the projectile fired from the earth. The value of the acceleration due to gravity on the planet is (in m/s^2) is: (given g = 9.8 m/s^2)

(1) 3.5 (2) 5.9

(3) 16.3 (4) 110.8

30. A particle is moving such that its position coordinates (x, y) are

(2m, 3m) at time t = 0

(6m, 7m) at time t = 2 s and

(13m, 14m) at time t = 5s.

Average velocity vector ($\vec{V}_{av}$) from t = 0 to t = 5 s is

(1) $\frac{1}{5}(13\hat{i}+14\hat{j})$ (2) $\frac{7}{3}(\hat{i}+\hat{j})$

(3) $2(\hat{i}+\hat{j})$ (4) $\frac{11}{5}(\hat{i}+\hat{j})$

AIPMT 2015

31. A particle of unit mass undergoes one-dimensional motion such that its velocity varies according to

$v(x) = \beta x^{-2n}$

where β and n are constants and x is the position of the particle. The acceleration of the particle as a function of x, is given by :

(1) $-2n\beta^2x^{-4n-1}$ (2) $-2\beta^2x^{-2n+1}$

(3) $-2n\beta^2e^{-4n+1}$ (4) $-2n\beta^2x^{-2n-1}$

32. A ship A is moving Westwards with a speed of 10 km/h and a ship B 100 km South of A, is moving Northwards with a speed of 10 km/h. The time after which the distance between them becomes shortest, is :-

(1) 5 h (2) $5\sqrt{2}$ h

(3) $10\sqrt{2}$ h (4) 0 h

Re-AIPMT 2015

33. Two particles A and B, move with constant velocities $\vec{v}_1$ and $\vec{v}_2$. At the initial moment their position vectors are $\vec{r}_1$ and $\vec{r}_2$ respectively. The condition for particle A and B for their collision is:-

(1) $\vec{r}_1-\vec{r}_2=\vec{v}_1-\vec{v}_2$ (2) $\frac{\vec{r}_1-\vec{r}_2}{|\vec{r}_1-\vec{r}_2|}=\frac{\vec{v}_2-\vec{v}_1}{|\vec{v}_2-\vec{v}_1|}$

(3) $\vec{r}_1\cdot\vec{v}_1=\vec{r}_2\cdot\vec{v}_2$ (4) $\vec{r}_1\times\vec{v}_1=\vec{r}_2\times\vec{v}_2$

NEET-I 2016

34. If the velocity of a particle is $v = At + Bt^2$, where A and B are constants, then the distance travelled by it between 1s and 2s is :-

(1) $\frac{3}{2}A+4B$ (2) 3A+7B

(3) $\frac{3}{2}A+\frac{7}{3}B$ (4) $\frac{A}{2}+\frac{B}{3}$

NEET-II 2016

35. Two cars P and Q start from a point at the same time in a straight line and their positions are represented by $x_P(t) = at + bt^2$ and $x_Q(t) = ft - t^2$. At what time do the cars have the same velocity?

(1) $\frac{a+f}{2(1+b)}$ (2) $\frac{f-a}{2(1+b)}$

(3) $\frac{a-f}{1+b}$ (4) $\frac{a+f}{2(b-1)}$

NEET(UG) 2017

36. Preeti reached the metro station and found that the escalator was not working. She walked up the stationary escalator in time t_1. On other days, if she remains stationary on the moving escalator, then the escalator takes her up in time t_2. The time taken by her to walk up on the moving escalator will be

(1) $\frac{t_1 t_2}{t_2 - t_1}$ (2) $\frac{t_1 t_2}{t_2 + t_1}$

(3) $t_1 - t_2$ (4) $\frac{t_1 + t_2}{2}$

37. The x and y coordinates of the particle at any time are $x = 5t - 2t^2$ and $y = 10t$ respectively, where x and y are in meters and t in seconds. The acceleration of the particle at t = 2s is :-

(1) 5 m/s^2 (2) – 4 m/s^2

(3) – 8 m/s^2 (4) 0

NEET(UG) 2019

38. The speed of a swimmer in still water is 20 m/s. The speed of river water is 10 m/s and is flowing due east. If he is standing on the south bank and wishes to cross the river along the shortest path, the angle at which he should make his strokes w.r.t. north is given by :

(1) 30° west (2) 0°

(3) 60° west (4) 45° west

39. When an object is shot from the bottom of a long smooth inclined plane kept at an angle 60° with horizontal, it can travel a distance x_1 along the plane. But when the inclination is decreased to 30° and the same object the shot with the same velocity, it can travel x_2 distance. Then $x_1 : x_2$ will be

(1) $1:\sqrt{2}$ (2) $\sqrt{2}:1$

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

NEET(UG) 2019 (Odisha)

40. A person standing on the floor of an elevator drops a coin. The coin reaches the floor in time t_1 if the elevator is at rest and in time t_2 if the elevator is moving uniformly. Then :-

(1) $t_1 < t_2$ or $t_1 > t_2$ depending upon whether the lift is going up or down

(2) $t_1 < t_2$

(3) $t_1 > t_2$

(4) $t_1 = t_2$

41. Two bullets are fired horizontally and simultaneously towards each other from roof tops of two buildings 100 m apart and of same height of 200m with the same velocity of 25 m/s. When and where will the two bullets collide. ($g = 10$ m/s^2)

(1) after 2s at a height 180 m

(2) after 2s at a height of 20 m

(3) after 4s at a height of 120 m

(4) they will not collide

42. A person travelling in a straight line moves with a constant velocity v_1 for certain distance 'x' and with a constant velocity v_2 for next equal distance. The average velocity v is given by the relation

(1) $\frac{1}{v} = \frac{1}{v_1} + \frac{1}{v_2}$ (2) $\frac{2}{v} = \frac{1}{v_1} + \frac{1}{v_2}$

(3) $\frac{v}{2} = \frac{v_1 + v_2}{2}$ (4) $v = \sqrt{v_1 v_2}$

NEET(UG) 2020

43. A ball is thrown vertically downward with a velocity of 20 m/s from the top of a tower. It hits the ground after some time with a velocity of 80 m/s. The height of the tower is :

($g = 10$ m/s^2)

(1) 300 m (2) 360 m

(3) 340 m (4) 320 m

NEET(UG) 2020 (Covid-19)

44. A person sitting in the ground floor of a building notices through the window, of height 1.5 m, a ball dropped from the roof of the building crosses the window in 0.1 s. What is the velocity of the ball when it is at the topmost point of the window ?

($g = 10$ m/s^2)

(1) 15.5 m/s (2) 14.5 m/s

(3) 4.5 m/s (4) 20 m/s

NEET(UG) 2021

45. A small block slides down on a smooth inclined plane, starting from rest at time t = 0. Let S_n be the distance travelled by the block in the interval t = n – 1 to t = n. Then, the ratio $\frac{S_n}{S_{n+1}}$ is :

(1) $\frac{2n-1}{2n}$ (2) $\frac{2n-1}{2n+1}$ (3) $\frac{2n+1}{2n-1}$ (4) $\frac{2n}{2n-1}$

46. A car starts from rest and accelerates at 5 m/s^2. At t = 4 s, a ball is dropped out of a window by a person sitting in the car. What is the velocity and acceleration of the ball at t = 6 s ? (Take g = 10 m/s^2)

(1) 20 m/s, 5 m/s^2 (2) 20 m/s, 0

(3) $20\sqrt{2}$ m/s, 0 (4) $20\sqrt{2}$ m/s, 10 m/s^2

47. A particle moving in a circle of radius R with a uniform speed takes a time T to complete one revolution.

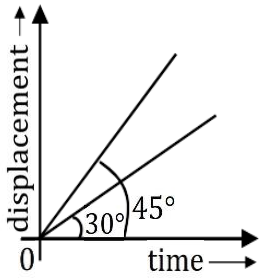
If this particle were projected with the same speed at an angle 'θ' to the horizontal, the maximum height attained by it equals 4R. The angle of projection, θ, is then given by :

(1) $\theta = \cos^{-1}\left(\frac{gT^2}{\pi^2 R}\right)^{1/2}$ (2) $\theta = \cos^{-1}\left(\frac{\pi^2 R}{gT^2}\right)^{1/2}$

(3) $\theta = \sin^{-1}\left(\frac{\pi^2 R}{gT^2}\right)^{1/2}$ (4) $\theta = \sin^{-1}\left(\frac{2gT^2}{\pi^2 R}\right)^{1/2}$

NEET(UG) 2022

48. The displacement-time graphs of two moving particles make angles of 30° and 45° with the x-axis as shown in the figure. The ratio of their respective velocity is :



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

49. The ratio of the distances travelled by a freely falling body in the 1st, 2nd, 3rd and 4th second :

(1) 1 : 4 : 9 : 16 (2) 1 : 3 : 5 : 7

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

50. A ball is projected with a velocity, 10 ms^{-1}, at an angle of 60° with the vertical direction. Its speed at the highest point of its trajectory will be:

(1) $5\sqrt{3}$ ms^{-1} (2) 5 ms^{-1}

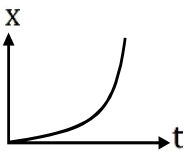
(3) 10 ms^{-1} (4) Zero

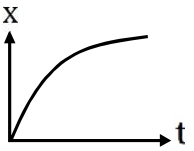
RE-NEET(UG) 2022

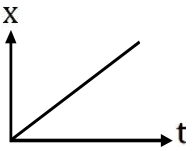
51. A cricket ball is thrown by a player at a speed of 20 m/s in a direction 30° above the horizontal. The maximum height attained by the ball during its motion is : (g = 10 m/s^2)

(1) 5 m (2) 10 m (3) 20 m (4) 25 m

52. he position-time (x – t) graph for positive acceleration is :

(1) 

(2) 

(3) 

(4)