

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

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Holidays' Assignments for Summer Vacations, June-2023

Class: XI Medical

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 1st stage of 9th 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 40%) 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 1 to 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 A4 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 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) A is true but R is false.
- iii) 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) A is true but R is false.
- iii) 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 gm/mol.
- 10.** The density of 3 M solution of NaCl is 1.25gm/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 CO₂(c) 52 a.mu of He
- 13.** Calculate the number of moles in (a) 5 L of 0.75 M Na₂CO₃ (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 N₂ 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 NH₃ in this solution.
- 17.** 3.0 g of H₂ react with 29.0 g O₂ to yield H₂O.
- 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 34.97u and 36.97u .the relative abundances of these two isotopes are 0.735 and 0.245 respectively. Find out average atomic mass of chlorine.
- 19.** Prepare at least two conversions for each:
- a) m³ to litre b) m³ to cm³ c) atm to barr d) Kelvin to °F e) cm² to nm²
- 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 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.
- 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 transition in a hydrogen spectrum would have the same wavelength as in the Balmer transition $n = 4$ to $n = 2$ of 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 electronegativity: 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 mendeleev's periodic table?
47. What are the general characteristics 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.

Biology

Syllabus for unit test:

- a) Excretory products & their elimination
 - b) Chemical co-ordination & integration
 - c) Movement & Locomotion
1. Write down NCERT and NCERT exemplar questions of chapters of human physiology.
 2. Read underline and learn all the concepts of chapters completed till now.
 3. Prepare an investigatory project Report on any two topics -

- a) Respiratory system Disorders
 - b) Cardiac system Disorders
 - c) Renal failure and Dialysis
 - d) Hormonal Disorders
4. Write Answers of following questions with their explanations in HHW notebook.
These questions consist of two statements each, printed as Assertion and Reason. While answering these Questions you are required to choose any one of the following four responses.
 (A) If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion.
 (B) If both Assertion & Reason are True but Reason is not a correct explanation of the Assertion.
 (C) If Assertion is True but the Reason is False.
 (D) If both Assertion & Reason are false.

1	Assertion :- Hypothalamus having osmoregulatory center. Reason :- ADH from supra optic nuclei of hypothalamus controls concentration of water.
2	Assertion :- Posterior lobe of pituitary gland secretes ADH & oxytocin. Reason :- ADH & oxytocin are formed in hypothalamus also called-neurohormones.
3	Assertion :- Parathormone & thyrocalcitonin are antagonist to each other. Reason :- Parathormone maintains Ca^{+2} concentration in blood and its receptors are present in osteoclast cell.
4	Assertion :- Thymus gland has important role in both CMI & AMI (Immunity). Reason :- Thymus gland maintains BMR & growth of body.
5	Assertion : Vasopressin is a neurohormone Reason : Vasopressin is synthesized by pars nervosa of pituitary gland
6	Assertion : Pituitary gland is ectodermal in origin Reason : Both parts of pituitary develop from nervous tissue
7	Assertion : Insulin act as a anti diabetogenic hormone. Reason : Deficiency of Insulin produce polyuria condition.
8	Assertion : Deficiency of vitamin – D causes rickets. Reason : It is obtained from intrinsic sources regularly.
9	Assertion : MSH & Melatonin are antagonistic hormones. Reason : MSH help in the wide distribution of melanin in melanocytes while melatonin collects the melanin at one place in melanocyte.
10	Assertion : Pineal gland found on the epithalamus of Diencephalon. Reason: It is a type of exocrine gland which is active in later age of life. stimulates mammary glands for the formation of milk, and oxytocin from the post pituitary causes the release of milk when the infant sucks breast.
11	Assertion : Pancreas is heterocrine gland. Reason : Pancreas secretes both protein & steroid hormones.
12	Assertion : Aldosterone is polypeptide hormone and control the Na^{+} & K^{+} ratio in body. Reason : Aldosterone increase reabsorption of Na^{+} from plasma of blood and control its loss and increase loss of K^{+} in body fluid.
13	Assertion : Two pituitary hormones of the mother take part in feeding the infant on milk. Reason : Prolactin from anterior pituitary
14	Assertion :- The wall of atria release ANF in response to high B.P. and blood volume. Reason :- ANF acts as vasodilator and inhibits the release of renin to lower the blood pressure
15	Assertion :- Mostly aquatic animals are ammonotelic. Reason :- Ammonia is the most toxic form and requires large amount of water for its elimination.
16	Assertion :- In fish ammonia is excreted by diffusion through gill surface as ammonium ions. Reason :- Some amount of urea may be retained in the kidney matrix of some animals to maintain a desired osmolarity.

17	Assertion :-Uricotelism is terrestrial adaptation. Reason :- Uric acid is least toxic and can be removed with a minimum loss of water.
18	Assertion :-In PCT all of the essential nutrient and 70-80 percent of electrolytes and water are reabsorbed. Reason :- PCT is lined by simple cuboidal brush border epithelium which increases the surface, are for reabsorption
19	Assertion :-When filtrate pass through descending limb of loop of Henle it becomes concentrate. Reason :- Descending limb allows transport of electrolytes actively or passively.
20	Assertion :-Conditional reabsorption of Na ions and water takes place in DCT. Reason :- DCT is also capable of selective secretion of hydrogen and potassium ions
21	Assertion :- Mammals have the ability to produce a concentrated urine. Reason :- Counter current mechanism occurs in vasa recta and Henle's loop.
22	Assertion :- An increase in glomerular blood pressure can activate the JG cells of kidney to release renin. Reason :- Angiotensin I is a powerful vasoconstrictor.
23	Assertion :-An increase in body fluid volume activate osmoreceptors, which stimulate the hypothalamus to release ADH. Reason :- ADH facilitates water reabsorption from later parts of the tubule.
24	Assertion :- Angiotensin II, activates the adrenal cortex to release aldosterone. Reason :- Aldosterone causes reabsorption of Sodium ions and water from the distal parts of the tubule.
25	Assertion :- Nearly 99 percent of the filtrate has to be reabsorbed by the renal tubules. Reason :- Glucose is reabsorbed by active mechanism in PCT.
26	Assertion :- The primary function of sweat is to facilitate a cooling effect on the body surface. Reason :- Small amount of nitrogenous wastes could be eliminated through saliva.
27	Assertion :- The descending limb of loop of Henle is permeable to water but almost impermeable to electrolytes. Reason :- Henle's loop plays a significant role in the maintenance of high osmolarity of medullary interstitial fluid.
28	Assertion :- In cortical nephrons, the loop of Henle is too short and extends only very little into medulla. Reason :- Vasa recta is absent or highly reduced in cortical nephrons.
29	Assertion :- ADH prevents diuresis. Reason :- ADH also affect the kidney function by its constrictory effects on blood vessels
30	Assertion :- Feedback mechanism for regulation of kidney involve hypothalamus & JGA. Reason :- ANF mechanism check renin-angiotensin mechanism.
31	Assertion :- Analysis of urine helps in clinical diagnosis of many metabolic disorder. Reason :- Glycosuria is indicative of diabetes insipidus.
32	Assertion :- Haemodialysis method is used in case of kidney failure. Reason :- Malfunctioning of kidney leads to uremia.
33	Assertion :- The JGA plays a complex regulatory role. Reason :- An increase in glomerular blood flow/ GFR can activate JG cells to release rennin.
34	Assertion :- Angiotensin II is a powerful vasconstrictor Reason :- Aldosterone causes reabsorption of Na ⁺ and water from distal parts of the tubule.
35	Assertion :- An increase in blood flow to the atria of heart can cause the release of ANF. Reason :- ANF can cause vasodilation and decrease the Blood pressure.
36	Assertion :- Human kidneys can produce urine nearly four times concentrated than the initial filtrate formed. Reason :- Counter current mechanism helps to maintain a concentration gradient in the medullary interstitium.
37	Assertion :- Antidiuretic hormone, increases the water permeability of distal convoluted tubule. Reason :- In the absence of ADH, water re-absorption is considerably increases.

38	Assertion :- Tubular secretion is of considerable importance in Marine teleost fishes. Reason :- These fishes do not have glomerulus kidney.
39	Assertion :- Bony fishes and tadpole are ammonotelic. Reason :- NH ₃ is highly soluble in water and excreted through urine.
40	Assertion :- Human kidneys can produce urine nearly four times concentrated than the initial filtrate formed. Reason :- Counter current mechanism helps to maintain a concentration gradient in the medullary interstitium.
41	Assertion :- Tubular secretion is of considerable importance in Marine teleost fishes. Reason :- These fishes do not have glomerulus kidney.
42	Assertion :- Bony fishes and tadpole are ammonotelic. Reason :- NH ₃ is highly soluble in water and excreted through urine
43	Assertion :- Diabetes insipidus is marked by excessive urination and too much thirst for water. Reason :- Anti-diuretic hormone is release by the posterior lobe of pituitary gland.
44	Assertion :- Antidiuretic hormone, increases the water permeability of distal convoluted tubule. Reason :- In the absence of ADH, water re-absorption is considerably increase
45	Assertion : Peritubular capillaries secrete substances in the convoluted tubules. Reason : Harmful and useless substances which escaped ultrafiltration are removed by active secretion.
46	Assertion : R.B.C. of a human may have A and B antigen. Reason :- AB blood group is only donar.
47	Assertion :- Arthritis is the inflammation of synovial joints. Reason :- Synovial joints are mobile type of joints.
48	Assertion : Ultrafiltration takes place in presence of effective filtration pressure Reason : In ultrafiltration process blood is filtered in bowman's capsule, filtered fluid contain protein & Blood corpuscles also
49	Assertion :- PCT is main site of selective reabsorption of useful materials from nephric filtrate. Reason :- Proximal convoluted tubule is lined by brush-bordered cuboidal epithelium.
50	Assertion :- Diabetes insipidus is marked by excessive urination and too much thirst for water. Reason :- Anti-diuretic hormone is release by the posterior lobe of pituitary gland.

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
 - Kapalbhathi 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 भूलूँ, शक्ति का दान देना |

Syllabus for UT:

1. Teen tala and Ek Tala with single and double.
2. Short notes 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.

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) $20\sqrt{5}$ 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 m ; 160 m
 - (2) 160 m ; 80π m
 - (3) 0 m ; 80π m
 - (4) 160 m ; 160π 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 = 3r
 - (2) displacement = $\sqrt{2}r$, distance = $\frac{3\pi r}{2}$
 - (3) distance = 2r, 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) ≥ 1
 - (3) ≤ 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) $8\pi R$
 - (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 in 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 km/h. At what speed should he run for the next 20 min so that the average speed comes to 12 km/h ?
 - (1) 13.5 km/h
 - (2) 10.2 km/h
 - (3) 8.2 km/h
 - (4) 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) 2π m/sec (2) 2 m/sec
 (3) 4π 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 $12\text{ m} \times 5\text{ m}$ 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 m/s^2 (2) -3.4 m/s^2
 (3) -1.1 m/s^2 (4) 3.2 m/s^2
- 27.** The CGS unit of acceleration is
 (1) m/s^2 (2) m/s (3) cm/min^2 (4) 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 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 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 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 ms^{-2} , the acceleration of the body is _____ 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) m/s^2 , m/s^2 (2) m/s , m/s^2
 (3) m/s^2 , m/s^3 (4) m/s , 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^{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 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 ($g = 9.8$ m/s²)
 (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 ($g = 9.8$ m/s²)
 (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 m/s², 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 m/s² (2) -9.8 m/s²
 (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 ($g = 9.8$ m/s²),
 (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 $g = 10$ m/s², 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, $g = 10$ m/s²)
 (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

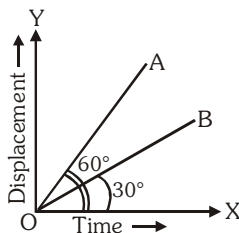
66. If the time of fall of two objects are in the ratio 1 : 2, find the ratio of the heights from which they fall.

(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

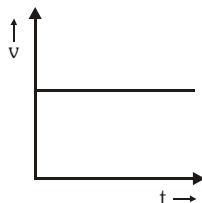
(1) 4.9 m (2) 19.6 m (3) 9.8 m (4) 39.2 m

68. From the position time graph for two particles A and B is shown below. Graph A and graph B are making angles 60° and 30° 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

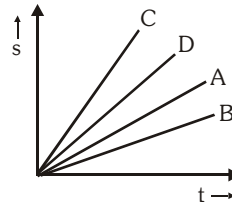


(1) in uniform motion
(2) at rest
(3) in non-uniform motion
(4) moving with uniform acceleration

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

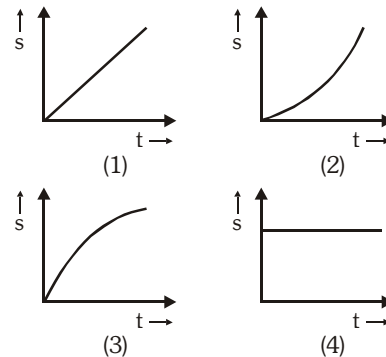
(1) m^2 (2) m
(3) m^3 (4) m s^{-1}

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



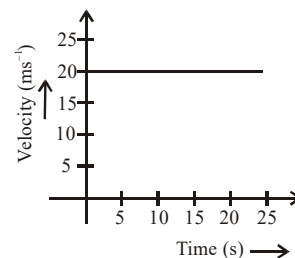
(1) Car A is faster than car D.
(2) Car B is the slowest.
(3) Car D is faster than car C.
(4) Car C is the slowest.

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



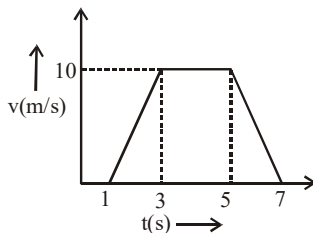
73. Slope of a velocity – time graph gives
(1) the distance (2) the displacement
(3) the acceleration (4) the speed

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,

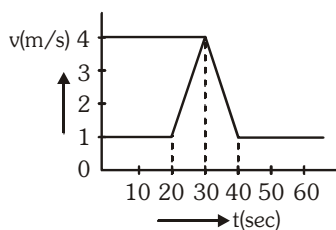


(1) 1.33 m/s^2 ; 150 m
(2) 0 m/s^2 ; 150 m
(3) 1.33 m/s^2 ; 300 m
(4) 0 m/s^2 ; 300 m

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

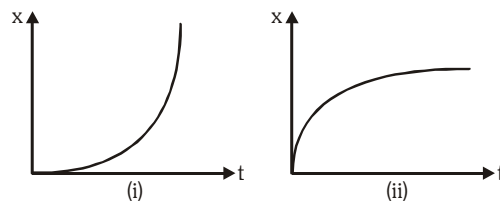


- (1) $1/4$ (2) $1/2$
(3) $1/8$ (4) $1/6$
76. The velocity of a body increases for sometime, then remains constant and then decreases until it comes to rest. When velocity is plotted against time the fig. obtained is :
- (1) triangle
(2) trapezium
(3) circle
(4) None of the above
77. The area under the 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

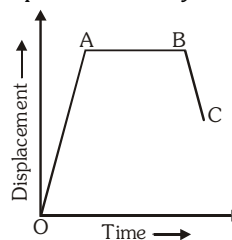


- (1) 60 m (2) 50 m
(3) 30 m (4) 40 m

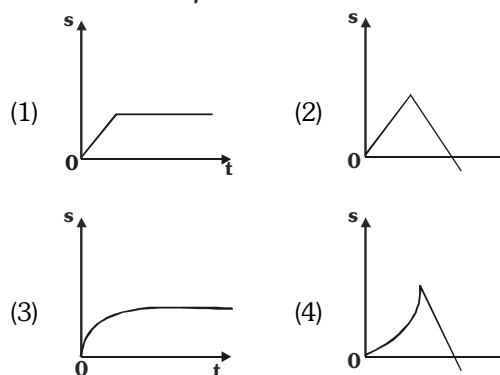
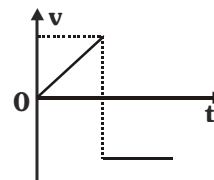
80. Figures (i) and (ii) below show the displacement-time graphs of two particles moving along the x-axis. We can say that



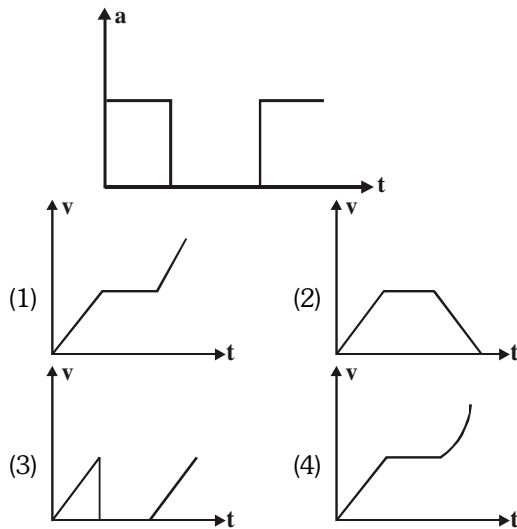
- (1) Both the particles are having a uniformly accelerated motion
(2) Both the particles are having a uniformly retarded motion
(3) Particle (i) is having a uniformly accelerated motion while particle (ii) is having a uniformly retarded motion
(4) Particle (i) is having a uniformly retarded motion while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



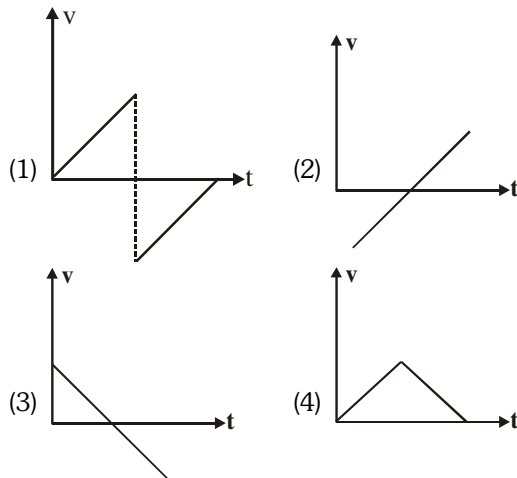
- (1) Backward with uniform velocity
(2) Forward with uniform velocity
(3) Backward with non-uniform velocity
(4) Forward with non-uniform velocity
82. The velocity-time graph for a particle moving along x-axis is shown in the figure. The corresponding displacement-time graph is correctly shown by



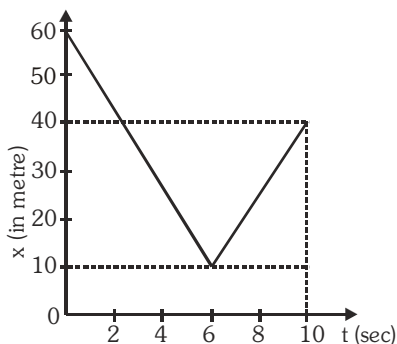
83. Which of the following graphs would probably show the velocity plotted against time graph for a body whose acceleration-time graph is shown in the figure?



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

86. Suppose a boy is enjoying a ride on a merry-go-round which is moving with a constant speed of 10 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 1m. If it makes 30 revolutions/sec., then the linear speed (in m/s) of a point on its circumference is

- (1) 30π (2) π (3) 60π (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 km/hr . The change in velocity (in 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) 2π (2) 8π (3) π (4) 4π
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 cm/s^2 (2) 34 cm/s^2
(3) 3.4 cm/s^2 (4) 0.34 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) $\frac{2\pi r}{(T/2)}$
-