

D.T.E.A. SENIOR SECONDARY SCHOOL, PUSA ROAD, NEW DELHI-110005
HOLIDAY HOME WORK
CLASS XII

ENGLISH

READING

1. Comprehension passages - 03
2. Note making passages - 05

WRITING

1. Notice writing - 05
2. Advertisements- 10
3. Posters - 05
4. Invitations - 05
5. Letter writing 05 EACH
Business letters, Complaint letters, Letter to Editor, Job application,
6. Articles, Speech and Debate - 03 each

FLAMINGO

1. Lesson 1-5 Question and Answers
2. Poems 1-4 Question and Answers and Comprehension

VISTAS

1. Tiger King Question and Answers
2. Enemy Question and Answers

Long Reading Text - Invisible Man

Chapters 15-28 Summary and Question and Answers

தமிழ்

1. முத்தமிழ் பற்றி விளக்கு.
2. தமிழ்மொழி செம்மொழி என்பதை விளக்கு.
3. பால்வண்ணம் பிள்ளை ---- கதையினை எழுதுக.
4. இறை வாழ்த்து, மொழி வாழ்த்து , நாட்டு வாழ்த்து உணர்த்தும் கருத்துகள் யாவை?
5. கொடுக்கப்பட்டுள்ள நான்கு கடிதங்களை எழுதி வரவும்.

6. கட்டுரை எழுதுக

- நான் விரும்பும் புலவர்.
- இந்தியாவின் துன்பங்களுக்குத் தீர்வுகள்.
- அறிவியலின் நன்மைகள் .
- நான் விருப்பம் இந்தியா.

7. கீழ் வரும் இலக்கணத்திற்கு நான்கு சான்றுகள் எழுதுக.

- செய்வினை.
- செயப்பாட்டு வினை.
- தன் வினை.
- பிற வினை.
- உணர்ச்சி வாக்கியங்கள்.

हिंदी

1. आत्म परिचय, दिन जल्दी जल्दी ढलता हे, बाज़ार दर्शन, पतंग, भक्तिन के पाठों के प्रश्नों के उत्तर नोट पुस्तिका में लिखें ।
2. एक निबंध और एक पत्र लिखें ।

GEOGRAPHY

1. Learn question and answers of Chapters 1 to 5 from first book.
2. Write 3 times question-answers of chapter 1 to 5 from first book in the holidays homework note.
3. Practice map work from chapters 2 to 5.
4. Complete the survey and make a report about it (Market Survey for Practical).

HISTORY

1. Write all source based question-answers from First book.
2. Do map work from 1st – 4th lesson.
3. Do power point presentation any one of the chapters 1 to 4.
4. Practice one word question well from Chapter 1 to 4.

POLITICAL SCIENCE

1. What is the difference between a unipolar and a bipolar world?
2. Explain briefly the Cuban missile crises?
3. What is WARSAW PACT and NATO?

4. Why did the super power have smaller states as their allies?
5. Mention the arenas of the cold war?
6. What was INDIA'S policy of NAM and mention the main objectives of NAM?
7. Why was INDIA'S policy of NAM was criticized?
8. How were the ideologies of US and USSR different?
9. Mention the characteristics of SOVIET POLITICAL SYSTEM?
10. Why did collapse of BERLIN WALL? Signify the collapse of BIPOLAR WORLD?
11. Why the SOVIET ECONOMY became stagnant?
12. Mention any three features that distinguish the SOVIET ECONOMY from the CAPITALIST ECONOMY like the US?
13. What were the factors that forced GORBACHEV to initiate the reforms in USSR?
14. What were the major consequences of the disintegration of the SOVIET UNION?
15. What is SHOCK THERAPY? What were the consequences of shock therapy?
16. What were the major consequences of the disintegration of SOVIET UNION for countries like INDIA?
17. The cold war produced an arm race as well as arms control. What were the reasons for both these developments?
18. What was SOVIET SYSTEM. Write any four features of SOVIET SYSTEM?
19. What does the term HEGEMONY mean s?
20. How was KUWAIT liberated from IRAQ in 1990?
21. What was 9/11 event? How did respond to it?
22. Explain the HEGEMONY of the US as a hard power?
23. What is meant by operation IRAQ freedom ? Mention its main and hidden objectives. Give any two consequences of this operation?
24. What are the different nature of HEGEMONY? Explain.
25. When and why did the new world order begin?
26. What is the first GULF WAR?
27. What is operation enduring freedom?
28. Discuss INDIA'S relationship with the US?
29. How can HEGEMONY be overcome?
30. What are the constraints on America hegemony today?
31. What was operation INFINITE REACH ordered by the president Clinton?

32. What is world politics?

33. Mention the period of beginning of US hegemony.

34. Name the elected president of the USA in the year 1992 and 1996.

35. What is the full form of WMD, SLOCS, NATO, SEATO, CENTO, NAM, LTBT, NPT, SALT-1&2, START 1&2.

36. Name the two blocks during the cold war era and the military pacts signed by them.

37. What is logic of deterrence?

38. Who were the founding fathers of NAM?

39. Who was the founder head of the USSR and the leader of the Bolshevik communist party?

40. Explain the strategies which may be performed by INDIA to maintain the INDO-US relation?

41. Write the name of the leaders of the soviet union (1917-1991).

42. What is a cold war?

II. 1. On the world map:-

Mark the NAM countries.

2. On the world map:-

Show the first world, second world and the third world countries

3. On the world map:-

Show the countries involved in the Arenas of the world war.

4. On the map of Europe :

1. Show the NATO members

2. Warsaw Pact members

3. Other Communist nations

5. On the World map :

Show the Common Wealth of Independent States (CIS).

III. Refer the cartoons or pictures the given page no: of your NCERT books and write what you know about it.

Page no: 9 (1, 2)

Page no: 37

Page no: 38

Page no: 47

PHYSICS

Q-1 All the solved examples, exercises and additional exercises of chapter 1, 2, 3 and 4 from NCERT Book to be done in a separate notebook.

Q-2 An investigatory Project on any of the following topics.

Electrostatics, Current Electricity, Magnetism, EMI and AC, Optics, Modern Physics, Electronics and Communication Systems.

Q-3 Write two practicals and two activities in practical notebook.

Q-4 Practice at least twenty numerical from Ch1 to 4 each. (From any refresher)

CHEMISTRY

UNIT 1 : SOLID STATE

1 MARK QUESTIONS

Q. 1. Name a liquid metal which expands on solidification.

Q. 2. How many number of molecules per unit cell which crystallizes in the form of end face centred (monoclinic) lattice with a molecule at each lattice.

Q. 3. What is the coordination number of carbon, in diamond?

Q. 4. Name the solid which has weakest intermolecular force?

Q. 5. Arrange the following types of interactions in correct order of their increasing strength: Covalent, hydrogen bonding, Vander Waals, dipole dipole

Q. 6. Give reason for the appearance of colour in alkali metal halides.

Q. 7. Which type of defect occur in AgBr?

Q. 8. Give one example of doping which produces p-type of semi-conductors.

Q. 9. Out of (a) Graphite and (b) Carbor undum which one is harder ?

Q. 10. How can a material be made amorphous ?

2 MARKS QUESTIONS

Q. 1. Give Reason :

The energy required to vaporize one mol of copper is smaller than that of energy required to vaporize 1 mol of diamond.

Q. 2. The unit cube length for LiCl (NaCl) is 5.14 \AA . Assuming anion-anion contact. Calculate the ionic radius for Chloride ion.

Q. 3. Give reasons :

(a) Diamond and rhombic Sulphur are covalent solids, but the latter has lower melting points.

(b) Among NaCl and CsCl, CsCl is quite stable.

Q. 4. How many unit cells are present in a cube shaped ideal crystal of NaCl of mass 1 gm ?

Q. 5. In the mineral spinel; having the formula $MgAl_2O_4$. The oxide ions are arranged in CCP, Mg^{2+} ions occupy the tetrahedral voids. While Al^{3+} ions occupy the octahedral voids.

(i) What percentage of tetrahedral voids is occupied by Mg^{2+} ions ?

(ii) What percentage of octahedral voids is occupied by Al^{3+} ions ?

Q. 6. Give reasons :

(a) Window glass of old building look milky.

b) Window glass of old building is thick at bottom.

(c) $CaCl_2$ will introduce Schottky defect if added to AgCl crystal.

Q. 7. Analysis shows that nickel oxide has the formula $NiO_{0.98}O_{1.00}$. What fractions of nickel exist as Ni^{2+} and Ni^{3+} ions ?

Q. 8. What type of defect can arise when a solid is heated ? Which physical property is affected by this and in what way ?

Q. 9. (a) What happens when a Ferromagnetic or Ferri magnetic solid is heated ?

(b) The ions of MgO and NaF all have the same number of electrons and intermolecular distance are about the same (235 & 215 pm). Why are the melting points are so different (2642 °C & 992 °C) ?

Q. 10. (a) If the radius of the Br ion is 0.182 nm, how large a cation can fit in each of the tetrahedral hole.

(b) AgI crystallizes in a cubic closed packed ZnS structure. What fraction of tetrahedral site is occupied by Ag ion ?

(c) At what temp. range, most of the metals becomes super conductors ?

Extra Questions for practice:

1. Write all the definitions and statement of laws involved in chapter-1,2 & 3
2. Write all the formulae with units for all the above three chapters

UNIT 2 : SOLUTIONS**1 MARK QUESTIONS**

- Q. 1. The vapour pressure of deliquescent substance is less or more than that of water vapours in air ?
- Q. 2. If 'a' is the degree of dissociation of Na_2SO_4 then write the Vant Hoff factor used for calculating the molecular mass.
- Q. 3. If 6.023×10^{20} molecules of urea are present in 100 ml of its soln. then what is the conc. of urea soln. ?
- Q. 4. Why camphor is used in molecular mass determination ?
- Q. 5. 0.004 M soln of Na_2SO_4 is isotonic with 0.01 M soln of glucose at the temp. What is the apparent degree of dissociation of Na_2SO_4 ?
- Q. 6. What happen when mango is placed in dilute aqueous solution of HCl ?
- Q. 7. Out of (a) 200 ml of 2 M NaCl Solution and (b) 200 ml of 1 M glucose Soln. which one has higher osmotic pressure ?
- Q. 8. Out of (a) 0.01 M KNO_3 (b) 0.01 M Na_2SO_4 which aqueous soln. will exhibit high B. P. ?
- Q. 9. Out of (a) 1 M CaCl_2 (b) 1 M AlCl_3 which aqueous soln. will show max. vapour pressure at 300 K ?
- Q. 10. Out of (a) $\text{HNO}_3 + \text{H}_2\text{O}$ and (b) $\text{C}_6\text{H}_6 + \text{C}_6\text{H}_5\text{CH}_3$ which will form max. boiling azeotrope ?

2 MARKS QUESTIONS

- Q. 1. Two solutions of a substance (non-electrolyte) are mixed in the following manner – 480 ml of 1.5 M (First Soln) + 520 ml of 1.2 M (Second Solution). What is the molarity of the final mixture ?
- Q. 2. To get the hard boiled eggs, why common salt is added to water before boiling the eggs ?
- Q. 3. Equimolal Soln of NaCl and BaCl_2 are prepared in H_2O . B. F. pt. of NaCl is found to be -2°C . What freezing point do you expect from BaCl_2 soln ?
- Q. 4. Why water cannot be separated completely from ethyl alcohol by fractional distillation ?
- Q. 5. Why a person suffering from high blood pressure is advised to take minimum quantity of common salt ?
- Q. 6. Chloro acetic acid is a monoprotic acid and has $K_a = 1.36 \times 10^{-3}$. Calculate b. p. of 0.01 M aqueous soln ? ($K_b = 0.51 \text{ k kg/mol}$)
- Q. 7. Which colligative property is preferred for the molar mass determination of macro molecules ? Why ?
- Q. 8. How much ethyl alcohol must be added to 1 litre of water so that the solution will freeze at 14°F ? (K_f for water = 1.86°C/mol)
- Q. 9. 75.2 g of phenol is dissolved in solvent of $K_f = 14$, if the depression in freezing point is 7 k. What is the % of phenol ?
- Q. 10. How many ml of 0.1 M HCl are required to react completely with 1 gm mixture of Na_2CO_3 & NaHCO_3 containing equimolar amounts of both ?

UNIT 3 : ELECTROCHEMISTRY**1 MARK QUESTIONS**

- Q. 1. Which solution will allow greater conductance of electricity, 1 M NaCl at 293 K or 1 M NaCl at 323 K and why ?
- Q. 2. What does the negative value of E°_{cell} indicate ?
- Q. 3. Why is the equilibrium constant K, related to only E°_{cell} and not E_{cell} ?
- Q. 4. What is the sign of G for an electrolytic cell ?

Q. 5. Rusting of iron is quicker in saline water than in ordinary water. Why is it so ?

Q. 6. What would happen if the protective tin coating over an iron bucket is broken in some places ?

Q. 7. Can a nickel spatula be used to stir a solution of Copper Sulphate ? Justify your answer.
($E^\circ_{\text{Ni}^{2+}/\text{Ni}} = -0.25 \text{ V}$ $E^\circ_{\text{Cu}^{2+}/\text{Cu}} = 0.34 \text{ V}$)

Q. 8. Which out of 0.1 M HCl and 0.1 M NaCl, do you expect have greater κ and why ?

Q. 9. Three iron sheets have been coated separately with three metals A, B, C whose standard electrode potentials are given below :

A B C Iron

E° value – 0.46 V – 0.66 V – 0.20 V – 0.44 V

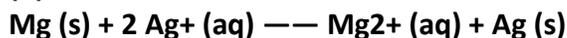
Identify in which rusting will take place faster when coating is damaged.

Q. 10. Which will have greater molar conductivity ? Solution containing 1 mol KCl in 200 cc or 1 mol of KCl in 500 cc.

2 MARKS QUESTIONS

Q. 1. (a) How will the value of E_{cell} change in an electrochemical cell involving the following reaction of the concentration of Ag^+ (aq) is increased ?

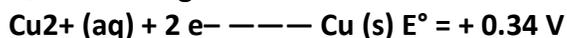
(b) What will be e. m. f. when the cell reaches equilibrium :



Q. 2. (a) In a cell reaction, the equilibrium constant K is less than one. Is E° for the cell positive or negative ?

(b) What will be the value of K if $E^\circ_{\text{cell}} = 0$?

Q. 3. Knowing that :



Reason out whether, 1 M AgNO_3 solution can be stored in Copper Vessel or 1 M CuSO_4 solution in Silver Vessel.

Q. 4. What is the number of electrons in one Coloumb of electricity ?

Q. 5. Which of the following pairs will have greater conduction and why ?

(a) Copper wire at 25 °C and Copper wire at 50 °C.

(b) 0.1 M acetic acid solution or 1 M acetic acid solution ?

3 MARKS QUESTIONS

Q. 1. The following curve is obtained when molar conductivity (κ) is plotted against the square root of concentration for 2 electrolytes A and B.

(a) What can you say about the nature of the two electrolytes A and B ?

(b) How do you account for the increase in molar conductivity κ for the electrolytes A and B on dilution ?

Q. 2. Iron and nickel are used to make electrochemical cell by using a salt bridge to join a half cell containing 1 M Fe^{2+} (aq) in which a strip of iron has been immersed to a second half cell which contains 1 M Ni^{2+} (aq) in which a strip of Ni has been immersed ? A voltmeter is connected between the two metal strips :
 $E^\circ_{\text{Fe}^{2+}/\text{Fe}} = -0.44 \text{ V}$ $E^\circ_{\text{Ni}^{2+}/\text{Ni}} = -0.25 \text{ V}$

(a) Write the name of the cathode and anode.

(b) Write the half reactions involved ?

(c) What would be the effect on the Voltmeter reading if Fe^{2+} concentration were increased ?

Q. 3. Consider the electrochemical cell :

$\text{Zn (s) / Zn}^{2+} \text{ (aq) // Cu}^{2+} \text{ (aq) / Cu}$. It has an electrical potential of 1.1 V when concentration of Zn^{2+} and Cu^{2+} ions is unity.

State the direction of flow of electrons and also specify if Zinc and Copper are deposited or dissolved at their respective electrodes. When :

(a) an external opposite potential of 0.8 V is applied.

(b) an external opposite potential of 1.1 V is applied.

(c) an external opposite potential of 1.4 V is applied.

Q. 4. Given that :



Explain why CO_3^{2-} is not stable in aqueous solution ?

Q. 5. For the reaction :



$$E^\circ = 0.80 \text{ V} \quad E^\circ = 0.79 \text{ V}$$

Predict the direction in which the reaction will proceed if :

$$[\text{Ag}^+] = 10^{-1} \text{ mol/l} \quad [\text{Hg}^{2+}] = 10^{-3} \text{ mol/l}$$

BIOLOGY

Q1 Learn all the exercise questions from chapter 1 to chapter 4 and write them in a separate notebook.

Q2 Practice all the diagrams of chapter 2 and chapter 3.

Q3 Practice questions from at least 5 sample papers related to chapters 1 to chapter 5.

Q4 How many pollen grains and ovules are likely to be formed in the anther and the ovary of the angiosperm bearing 25 microspore mother cell and 25 megaspore mother cell respectively.

Q5 List and explain various types of contraceptive methods.

Note: Do all the questions in a separate note book.

MATHEMATICS

CONTINUITY AND DIFFERENTIABILITY

1. Determine the value of k for which the function

$$F(x) = \begin{cases} \sin 5x/3x, & \text{if } x \neq 0 \\ K, & \text{if } x=0 \end{cases} \quad \text{is continuous at } x=0$$

2. Discuss the continuity of the function $f(x) = \begin{cases} 3x-2, & \text{when } x \leq 0 \\ x+1, & \text{when } x > 0 \end{cases}$ at $x=0$

3. Prove that $f(x) = \begin{cases} 2x, & \text{when } x < 2 \\ 2, & \text{when } x = 2 \\ x^2, & \text{when } x > 2 \end{cases}$ is discontinuous at $x=2$

4. Find the value of k for which $f(x) = \begin{cases} x^2 - 2x - 3 / x + 1, & \text{when } x \neq -1 \\ K, & \text{when } x = -1 \end{cases}$ is continuous at $x=-1$

5. Find the value of k for which $F(x) = \begin{cases} 1 - \cos 2x / 2x^2, & \text{when } x \neq 0 \\ K, & \text{when } x = 0 \end{cases}$ is continuous at $x=0$

6. Show that $f(x) = x^2 - 3x - 4$ is continuous at $x=1$

7. Prove that $f(x) = \begin{cases} \cos x, & \text{when } x \geq 0 \\ -\cos x, & \text{when } x < 0 \end{cases}$ is discontinuous at $x=0$

8. Prove that $f(x) = \begin{cases} 5x - 4, & \text{when } 0 < x \leq 1 \\ 4x^3 - 3x, & \text{when } 1 < x < 2 \end{cases}$ is continuous at $x=1$

9. Differentiate the following with respect to x

a) $\log(\log x)$ b) $\text{Log} \sin x / 2$ c) $(3-4x)^5$ d) $(ax^2 + bx + c)^{18}$ e) $(\log \cos x)^2$ f) $\text{Cos}^2 x^3$

g) $\sin x \sin 2x$ h) $3^{(5x-2)}$ j) $e^x \log(1+x^2)$ k) $\sqrt{x} \sin x$ l) $\sqrt{\frac{1+\sin x}{1-\sin x}}$ m) $2^{\log(\cos x)}$

10. Find dy/dx when

i) $y = \log\left(\frac{1+\sin x}{1-\sin x}\right)$ ii) $y = e^x \log(\sin 2x)$ iii) $Y = \log(\sqrt{x-1} + \sqrt{x+1})$ iv) $Y = \frac{\cos x - \sin x}{\cos x + \sin x}$

v) $y = e^x \cos^3 x \sin^3 x$ vi) $Y = (2x+3)^{(3x-5)}$ vii) $Y = (2x+3)^5 (3x-5)^7 (5x-1)^3$ viii) $Y = x^{\sin x} + (\sin x)^x$

11. Find dy/dx , when $x = e^t(t + 1/t)$ $y = e^{-t}(t - 1/t)$
12. If $x = 3\cos \theta - 2\cos^3 \theta$, $y = 3\sin \theta - 2\sin^3 \theta$, show that $dy/dx = \cot \theta$
13. Differentiate e^x w.r.t. \sqrt{x}
14. Differentiate $\sin^{-1}(2x/1+x^2)$ w.r.t. $\cos^{-1}(1-x^2/1+x^2)$
15. Differentiate $y = e^{4x}\sin 3x$, find d^2y / dx^2
- 16.. Find the second order derivative of
- i) x^x ii) $\log x$ iii) $e^{3x}\sin 4x$ iv) $\sin 3x\cos 4x$ v) $\tan^{-1}x$
- 17.. If $y = (\sin^{-1}x)^2$, prove that $(1-x^2)y_2 - xy_1 - 2 = 0$
18. If $y = a \cos(\log x) + b \sin(\log x)$, prove that $x^2y_2 + xy_1 + y = 0$
- 19.. If $y = e^{\tan x}$, prove that $\cos^2 x y_2 - (1 + \sin 2x)y_1 = 0$
- 20.. If $y = \tan^{-1}x$, show that $(1+x^2)y_3 - 3xy_2 - y_1 = 0$
21. If $x = (2\cos \theta - \cos 2\theta)$ and $y = (2\sin \theta - \sin 2\theta)$, find the second order derivative at $\theta = \pi/2$
- 22.. Find the derivative of $\log(x^x + \operatorname{cosec}^2 x)$
23. If $x^3 + y^3 = 3axy$, find dy/dx . If $ax^2 + 2bxy + by^2 + 2gx + 2fy + c = 0$, find dy/dx
24. Find the derivative of $\tan^{-1}(\cot x) + \cot^{-1}(\tan x)$
- 25.. Differentiate w.r.t. x $\tan^{-1}\left(\frac{\sin x}{1 + \cos x}\right)$
26. Differentiate $\cot^{-1}\left(\frac{1-x}{1+x}\right)$
27. Differentiate $\cos^{-1}(4x^3 - 3x)$
28. If $y = e^{ax}\cos bx$, show that $y_2 - 2ay_1 + (a^2 + b^2)y = 0$
29. If $y = (a \sin x + b \cos x)$, show that $y_2 + y = 0$

APPLICATION OF DERIVATIVES

- The side of a square sheet of metal is increasing at 4cm/min. At what rate is the area increasing when the side is 8cm long?
- The radius of a circle is increasing at the rate of 5cm/min. What is the rate of increasing of its circumference?
- A balloon which always remains spherical, has a variable radius. Find the rate at which its volume is increasing w.r.t. its radius when radius is 7cm?
- Find the interval in the following functions are strictly increasing or decreasing?

- i) $3x^2-4x$ ii) x^3-6x^2-1 iii) $6-9x-x^2$ iv) $x^3+12x^2+36x+6$ v) $2x^3 - 24x + 5$
- Find for which value of x , the function $f(x) = 2x^3 - 15x^2 + 36x + 7$ is strictly increasing or decreasing?
 - Show that $f(x) = x^2 - x \sin x$ is an increasing function on $(0, \pi/2)$
 - Find the equation of the tangent to the curve $y = \cot^2 x - 2\cot x + 2$ at $x = \frac{\pi}{4}$
 - Find the point on the curve $y = x^3$ at which the tangent is horizontal?
 - Find the points on the curve $x^2 + y^2 - 2x - 3 = 0$ at which the tangent is parallel to y axis?
 - Find the equation of normal to the curve $x^2 = 4y$ which passes through the point $(1,2)$.
 - Show that the tangent lines to the curve $y^2 = 4ax$ at the point $x = a$ are orthogonal
 - If the slope of tangent to the curve $y = x^3 + ax + b$ at the point $(1,-6)$ is -1 , find the values of a and b .
 - Find the condition such that the curves $4x = y^2$ and $4xy = k$ cut at right angles?
 - Using differentials find the approximate value of
 - $(255)^{1/4}$
 - $(28)^{1/3}$
 - $(31.9)^{1/5}$
 - $(51)^{1/2}$
 - $(0.999)^{1/10}$
 - Find the approximate value of $f(4.002)$ where $f(x) = 3x^2 - 5x + 9$
 - Prove that the perimeter of a right triangle of the given hypotenuse is maximum, when the triangle is isosceles
 - Show that of all the rectangles of given area, the square has the smallest perimeter.
 - Prove that the surface area of solid cuboid of a square base and given volume is minimum, when it is a cube.
 - A given quantity of metal is to be cast half cylinder with a rectangular box and semicircular ends. Show that the total surface area is minimum when the ratio of the length of cylinder to the diameter of its semicircular ends is $\sqrt{2} : (\sqrt{2} + 2)$.
 - An open box with square base is to be made out of a given iron sheet of area 27 sq. meter, show that the maximum value of the box is 13.5 cubic meters.

RELATIONS AND FUNCTIONS

- Show that the function $f: \mathbb{R} \rightarrow \mathbb{R}$ given by $f(x) = x^3 + x$ is bijection
- If the function $f: [1, \infty) \rightarrow [1, \infty)$ defined by $f(x) = 2^{x(x-1)}$ is invertible, find $f^{-1}(x)$
- If $f: \mathbb{R} \rightarrow \mathbb{R}$ is defined by $f(x) = 3x+2$, define $f[f(x)]$
- Write $f \circ g$, $f: \mathbb{R} \rightarrow \mathbb{R}$ and $g: \mathbb{R} \rightarrow \mathbb{R}$ are given by $f(x) = 8x^3$ and $g(x) = x^{1/3}$
- Find $f \circ g(x)$ if $f(x) = |x|$ and $g(x) = 4x-2$
- If $f(x) = x+7$ and $g(x) = x-7$, $x \in \mathbb{R}$ find $f \circ g(x)$
- If the binary operations $*$ on the set of integers \mathbb{Z} , is defined by $a*b = a+3b^2$ then find the value of $2*4$
- If the binary operation $*$ defined on \mathbb{Q} is defined as $a*b = 2a+b-ab$ for all $a, b \in \mathbb{Q}$, find $3*4$

9. What is the range of the function $f(x) = \frac{x-1}{x-1}$

10. If f is invertible function defined as $f(x) = \frac{3x-4}{5}$ write $f^{-1}(x)$

11. Show that the relation R on the set R of real numbers defined as $R = \{(a,b) : a \leq b^2\}$ is neither reflexive nor symmetric nor transitive

INVERSE TRIGONOMETRIC FUNCTIONS

1. Write the principal value of $\tan^{-1} 1 + \cos^{-1} -1/2$
2. Write the value of $\tan(2\tan^{-1} 1/5)$
3. Write the principal value of $\tan^{-1} \sqrt{3} - \cot^{-1} -\sqrt{3}$
4. Evaluate $\tan^{-1} 2\sin(2\cos^{-1} \sqrt{3}/2)$
5. Show that $\tan(1/2 \sin^{-1} 3/4) = 4-\sqrt{7}/3$
6. Solve the equation $\cos(\tan^{-1} x) = \sin(\cot^{-1} 3/4)$
7. Find the value of $\sin^{-1}(\cos(\frac{43\pi}{5}))$
8. Find the value of $\sin^{-1} 4\pi/5$
9. Write the principal value of $\cos^{-1}(\frac{1}{2}) - 2\sin^{-1}(-1/2)$
10. Write the principal value of $\tan^{-1} \sqrt{3} - \sec^{-1} -2$
11. Prove that $2\tan^{-1} 1/2 + \tan^{-1} 1/7 = \sin^{-1} 31/25\sqrt{2}$
12. Evaluate $\tan(1/2 \cos^{-1} \sqrt{5}/3)$
13. Solve $\tan^{-1}(x-1) + \tan^{-1} x + \tan^{-1}(x+1) = \tan^{-1} 3x$
14. Express in simplest form $\tan^{-1} 1/\sqrt{x^2-1}$
15. Prove that $\cot^{-1} 7 + \cot^{-1} 8 + \cot^{-1} 18 = \cot^{-1} 3$
16. Prove that $\tan^{-1} \frac{1}{2} + \tan^{-1} \frac{1}{5} + \tan^{-1} \frac{1}{8} = \frac{\pi}{4}$
17. Solve the equation $\sin^{-1} \frac{3x}{5} + \sin^{-1} \frac{4x}{5} = \sin^{-1} x$
18. Solve $2\tan^{-1}(\sin x) = \tan^{-1}(2\sec x)$
19. Prove that $\sin^{-1} \frac{4}{5} + \sin^{-1} \frac{5}{13} + \sin^{-1} \frac{16}{65} = \pi/2$
20. Prove that $\tan^{-1} \frac{1}{4} + \tan^{-1} \frac{2}{9} = 1/2 \cos^{-1} 3/5$

ACCOUNTANCY

1. Solve all the 'Additional Questions' from chapters 1, 2 and 3 from D.K. Goel up to the portion covered in class.
2. Prepare chapters 1, 2 and 3 for a class test after the reopening of the school.
3. Complete the 'Comprehensive' project work.

BUSINESS STUDIES

- 1. Solve the case studies of chapters 1, 2 and 3.**
- 2. Prepare chapters 1, 2 and 3 for a class test after the reopening of the school.**
- 3. Complete the project work on 'Principles of Management' or 'Business Environment'.**
- 4. Watch the movie 'Chak De India' and identify the 14 principles of Management from it.**

ECONOMICS

- 1. Revise chapter 1-7.**
 - 2. Also practice concept based questions and HOTS and applications questions of the above mentioned chapters. Also complete the notebook.**
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