



Delhi Public School Guwahati
"Under the aegis of the Delhi Public School Society, Delhi"

Holiday Homework(2014-15)

Class-XII

Subject: English

- 1) To read the book given for extra reading "THE INVISIBLE MAN" and write the Character sketch of The Invisible Man.
- 2) Write an article on the evils of the dowry system in about 200 words.
- 3) You are asked to deliver a speech on noise pollution in big cities. Write the speech in about 200 words.

Subject – Chemistry

1. What is a semiconductor? Describe the two main type of semiconductors and explain mechanism of their conduction. (2008)
2. What type of substances exhibit antiferromagnetism? (2008)
3. Explain the following properties with examples:
4. Ferromagnetism b) paramagnetism c) ferrimagnetism
5. Which point defect in crystals does not alter the density of the relevent solid? (2009)
6. Iron has a BCC unit cell with edge length of 286.65 pm. The density of iron is 7.87 g cm^{-3} . Use this information to calculate Avogadro's no ($\text{Fe} = 56 \text{ g mol}^{-1}$) (2009)
7. Which point defect in crystals alter the density of the relevent solid? (2009, 2010)
8. Which point defect in crystals increases the density of the relevent solid? (2009)
9. Write a feature which will distinguish a metallis solid from a ionic solid. (2009)
10. The well known mineral fluorite is chemically calcium fluoride. It is known thet in one unit cell of this mineral there are 4 Ca^{2+} and 8 F^- ions and that Ca^{2+} are arranged in a FCC lattice. The F^- ions fill all the tetrahedral voids the edge of the unit cell is $5.46 \times 10^{-8} \text{ cm}$ in length. The density of the solid is 3.18 g cm^{-3} . Use this information to calculate Avogrado's No. (molar mass Of $\text{CAF}_2 = 78.08 \text{ g mol}^{-1}$) (2010)
11. Which point defect in crystals decreases the density of the relevent solid? (2010)
12. The density of copper metal is 8.95 g cm^{-3} . If the radius of copper atom is 127.8pm, is the copper unit cell a simple cubic, a body centred cubic or a face centred cubic structure.(given $\text{Cu} = 63.54 \text{ u}$) (2010)
13. Calculate the temperature at which a solution containing 54 g of glucose in 250 g of water will freeze. ($K_f = 1.86 \text{ K kg mol}^{-1}$) (2008)
14. 100 mg of a protin is dissolved in just enough water to make 10.0 ml of solution. If this solution has an osmotic pressure of 13.3 mm Hg at 25°C , what is the molar mass of the protein. ($R = 0.082\text{LatmK}^{-1}\text{mol}^{-1}$ and $760 \text{ mm Hg} = 1 \text{ atm}$) (2009)
15. Calculate the freezing point depresion expected for 0.0711 m aqueous solution of Na_2SO_4 , If the solution actually freezes at -0.320°C , what would be its vant Hoff's factor? ($K_f = 1.86^\circ\text{C mol}^{-1}$) (2009)
16. Non – ideal solutions exhibit either + ve or –ve deviation from Raoult's Law. What are these deviations and why are they caused? Excpain with one example of each type. (2010)

17. A solution prepared by dissolving 1.25 g of oil of winter green (methyl salicylate) in 99 g of benzene has a boiling point of 80.31°C . Determine the molar mass of the compound. (BP of pure benzene = 80.10°C and K_b for benzene = $2.53^{\circ}\text{C kg mol}^{-1}$. (2010)
18. A solution of glycerol($\text{C}_3\text{H}_8\text{O}_3$ $M = 92 \text{ g mol}^{-1}$) in water was prepared by dissolving some amount of glycerol in 500 g of water. this solution has a boiling point of 100.42°C . What mass of glycerol was dissolved to make the solution? (K_b for water = $0.512 \text{ K kg mol}^{-1}$) (2010)
19. Why does Molality of a solution remain unchanged with temperature?
20. What do you mean by vapour pressure of a liquid? Why does the vapour pressure of a liquid decreases when some non-volatile solid is added to it?
21. What are colligative properties? Why does the value of any colligative property of 1 molal solution of NaCl is double that of 1 molal solution of urea?
22. Show diagrammatically the elevation of boiling point and depression in freezing point.
23. Which of the following solution have high melting point, 0.1 m Na_2SO_4 or 0.1 m NaCl and Why?
24. Calculate the van't Hoff's factor for certain electrolyte AB at a concentration where it is 10% ionized.
25. Calculate the osmotic pressure of a solution made by dissolving 36 g of glucose and 17.1 g sucrose in 250 cm^3 of water at 47°C . $R = 0.082 \text{ L atm K}^{-1} \text{ Mol}^{-1}$.
26. What is a primary cell? Give one example. (2008)
27. The conductivity of 0.20 M solution of KCl at 298 K is 0.0248 S cm^{-1} . Calculate its molar conductivity. (2008)
28. Depict the galvanic cell in which the reaction $\text{Zn(s)} + 2\text{Ag}^+(\text{aq}) \rightarrow \text{Zn}^{2+}(\text{aq}) + 2\text{Ag(s)}$ takes place. Further show: (2008)
 - (i) Which of the electrode is negatively charged?
 - (ii) The carriers of the current in the cell.
 - (iii) Individual reaction at each electrode.
29. a) Define molar conductivity of a substance and describe how for weak and strong electrolyte, molar conductivity changes with concentration of solute. How is such change explained? (2009)
 - b) A voltaic cell is set up at 25°C with the following half cells:
 $\text{Ag}^+(0.001\text{M}) | \text{Ag}$ and $\text{Cu}^{2+}(0.10) | \text{Cu}$
 what would be the voltage of this cell? ($E^{\circ}_{\text{cell}} = 0.46 \text{ V}$) (2009)
30. a) What type of cell is the lead storage battery? Write the anode and the cathode reactions and the overall reaction occurring in the lead storage battery while operating. (2010)
 - b) Calculate the equilibrium constant for the reaction
 $\text{Fe (s)} + \text{Cd}^{2+}(\text{aq}) \rightleftharpoons \text{Fe}^{2+}(\text{aq}) + \text{Cd (s)}$
 (given $E^{\circ}(\text{Cd}^{2+} | \text{Cd}) = -0.40 \text{ V}$, $E^{\circ}(\text{Fe}^{2+} | \text{Fe}) = -0.44 \text{ V}$)
31. a) State Kohlrausch's Law of independent migration of ions. Write an expression for the molar conductance at infinite dilution for acetic acid at infinite dilution according to the law. (2010)
 - b) Λ_m^{∞} for NaCl, HCl and NaAc are 126.4, 425.9 and $91.0 \text{ S cm}^2 \text{ mol}^{-1}$ respectively. Calculate Λ_m^{∞} for HAc.
32. Define the term order of a reaction for chemical reactions. (2008, 2010)
33. A first order reaction takes 40 min for 30% decomposition. Calculate $t_{1/2}$. (2008)

34. Derive the general form of the expression for the half life of a first order reaction.
(2008)
35. Mention the factors that affect the rate of a chemical reaction.
(2008)
36. The half-life for radioactive decay of ^{14}C is 5730 years. An archaeological artifact containing wood had only 80% of the ^{14}C found in a living tree. Estimate the age of the sample.
(2008)
37. A first order reaction has a rate constant of 0.0051 min^{-1} . If we begin with 0.01 M concentration of the reactant, what concentration of the reactant will remain in the solution after 3 hrs?
(2009)
38. The rate constant of a reaction of zero order is $0.0030 \text{ mol L}^{-1} \text{ s}^{-1}$. How long will it take for the initial concentration of A to fall from 0.10 M to 0.075 M?
(2010)
39. Define 'rate of a reaction' (2010)

Subject: Accountancy

Class XII - Questions from Academic Window Chapter 1 and 2.

CLASS XII HISTORY

1. On the outline political map of India mark the places of Indian History
 - (i) Mature Harappan Sites
 - (ii) Mahajanapada and cities
 - (iii) Distribution of Ashokan Empire
 - (iv) Important Kingdoms and towns
 - (v) Major Buddhist Sites
 - (vi) Territories/cities under British control in 1857
 - (vii) Main centres of the Revolt of 1857
 - (viii) Important centres of National movement
2. Prepare a project report on any one of the Themes of Indian History
 - (i) Ancient forms of Marriage
 - (ii) Ashoka- From a warrior to a messenger of Peace
 - (iii) Buddha and Buddhism -growth and impact
 - (iv) Mahabharata through a reader's eye
 - (v) Revolt of 1857
 - (vi) Mahatma Gandhi and the Nationalist movement
 - (vii) Partition of India

The project work should be done in groups only.

The project work can culminate in the form of power point presentation .

Subject : INFORMATICS PRACTICES (065)

Q1 a. While working a Form in NetBeans, Mr. Munish Jha wants to display a list of tourist places to allow the users to select their own tourist place. Suggest him to choose most appropriate control unit out of ListBox and ComboBox.

- b. What is the purpose of *default* keyword while using SWITCH statement?
- c. What will be values of *a* and *b* after execution of the following code:

```
int a=1, b=0;
for(a=2;a<=4;++a)
{
    b=a++;
    --b;
}
```

- d. Write JAVA code that takes value for a number in TextField1 and square it and display the output in message dialog box.

Q.2 a. Write MySQL command to create a new database?

- b. Pankaj create a table with some columns in MySQL. Later on he realized that there should have increased size for a column in the table. Which command should he use to increase size for a column in the table.
- c. Give one difference between CREATE and DELETE commands used in MySQL.
- d. Can a table have multiple primary keys? Can it have multiple foreign keys?
- e. Distinguish between Primary key and Candidate key with the help of a suitable example.
- f. A table “Stock” in a database has 5 columns and 17 rows. What are the degree and cardinality of this table?
- g. The contents of Item_no and Cost columns of a table “ITEMS” are given below:

Item_no	Cost
101	5000
102	6000
103	NULL
104	NULL
105	6000

Based on this information, find the output of the following queries:

- (i) SELECT AVG(Cost) FROM ITEMS;
- (ii) SELECT COST+100 FROM ITEMS WHERE Item_no>103;

Q.3 a. Write the purpose of the following statement:

```
jTextField1.setText(Integer.toString(Num+5));
```

- b. What is Primary Key, Foreign Key and Candidate Key?
- c. Rewrite the following program code using a FOR loop:

```
int i=1, s=0;
while(i<10)
{
    s+=i; i+=2;
}
```

- d. What will be the contents of F1 and F2 after the following code is executed?
- ```
string F1="Happy", F2="Winter";
F1=F1.concat(F2);
```

- e. Glamour Garments has developed a GUI application for their company as shown below:

|                  |                                                                    |                                          |
|------------------|--------------------------------------------------------------------|------------------------------------------|
| Name of Customer | <input type="text"/>                                               | <input type="button" value="Clear"/>     |
| Bill Amount      | <input type="text"/>                                               | <input type="button" value="Stop"/>      |
| Mode of payment  | <input type="text" value="Cash"/> <input type="button" value="v"/> | <input type="button" value="Calculate"/> |
| Discount         | <input type="text"/>                                               |                                          |
| Net Amount       | <input type="text"/>                                               |                                          |

The company accepts payment in 3 modes – cheque, cash and credit cards.  
The discount is given as per mode of payment as follows:

| Mode of Payment | Discount |
|-----------------|----------|
| Cash            | 8%       |
| Cheque          | 5%       |
| Credit Card     | Nil      |

If the Bill amount is more than 15000 then the customer gets an additional discount of 10% on bill amount.

- Q.4
- Write code to make the textfields for Discount and Net Amount uneditable.
    - Write code to calculate the Net Amount and Discount when Calculate is clicked.
    - Write code to Clear button and make blank all textfields.
    - Write code to Stop button.
  - Explain the purpose of DML commands used in SQL. Also give one example.
  - Write the output of the following SQL queries:
    - `SELECT ROUND(7.777,2);`
    - `SELECT MID('Year 2012',3,3);`
  - Consider the table TEACHER given below. Write the commands in SQL for (i) to (iv) and output for (v) to (viii)

**TEACHER**

| ID | Name            | Department | HireDate | Category | Gender | Salary |
|----|-----------------|------------|----------|----------|--------|--------|
| 1  | Tarun Nanda     | Hindi      | 17-03-94 | TGT      | M      | 25000  |
| 2  | Sanajy Sharma   | English    | 12-02-90 | PRT      | M      | 20000  |
| 3  | Nikhil Arora    | Arts       | 16-05-80 | PGT      | M      | 30000  |
| 4  | James Kaur      | Science    | 16-10-89 | TGT      | M      | 25000  |
| 5  | Jaspreet Sehgal | Science    | 01-08-90 | PGT      | F      | 22000  |
| 6  | Siddhart Kapoor | English    | 10-02-80 | PRT      | M      | 21000  |
| 7  | Sonali Khanna   | Arts       | 02-09-94 | TGT      | F      | 27000  |
| 8  | Mukul Roy       | Computer   | 14-11-80 | TGT      | M      | 30000  |

- To display all information about teachers of PGT category.
- To list the names of female teachers of Hindi department.
- To list names, departments, and hiring dates of all the teachers in ascending order of hiring date.

- (iv) To count the number of teachers in English department.
- (v) SELECT MAX(HireDate) FROM TEACHER;
- (vi) SELECT DISTINCT(Category) FROM TEACHER;
- (vii) SELECT COUNT(\*) FROM TEACHER WHERE Category='PGT';
- (viii) SELECT AVG(Salary) FROM TEACHER GROUP BY Gender;

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## Sub: Accountancy

### WORK SHEET

1. A & B formed a partnership firm of low cost school uniforms to the students belonging to low income group who have been admitted to the private schools of the city as per the provisions of the Right to Education Act 2009. B requested to admit his friend C a visually handicapped unemployed person also to be a member of the proposed firm. All of them agreed to form a partnership firm but they were not having enough capital to invest. A therefore persuaded a rich friend of his D, who hailed from Arunachal Pradesh to be a partner and contribute the required capital. All of them formed a partnership on the following terms.
  - a) A will contribute 100,000, B 50,000, C 10,00,000 n D will be a partner without capital.
  - b) Profits will be shared equally.
  - c) Interest on capital will be allowed @5 % pa

The profits of the firm for the year ended 31<sup>st</sup> March 2012 were 150,000.

  - i) Identify any three values which according to you motivated them to form the partnership firm.
  - ii) Prepare P/L Appropriation for the year ending 31<sup>st</sup> March 2012
2. A, B and C are partners in a firm. They had omitted interest on capital @ 10% for 3 years ended 31<sup>st</sup> March 2012. Their fixed capitals on which interest was to be calculated throughout were
 

A.....100,000

B.....80,000

C.....70,000

Give the necessary journal entry with working notes.

3. Following the Balance Sheet of X & Y, who share Profits n Losses in the ratio 5 : 3 as at 31<sup>st</sup> March 2012. They admit Z into the firm for ¼ th share in the profits to be contributed equally by X & Y. On the date of admission , the Balance Sheet of X & Y was as follows:

| <u>LIABILITIES</u>    | <u>AMT</u> | <u>ASSETS</u> | <u>AMT</u> |
|-----------------------|------------|---------------|------------|
| Sundry creditors..... | 2000       | Cash          |            |
| .....                 | 6,000      |               |            |

Bank Loan .....12000

Debtors.....8,000

Reserve Fund A/c..... 4000

Stock.....10,000

X's capital.....30,000

Machinery.....26, 000

Y's capital.....20,000

18,000

Furniture.....

68,000

68,000

Terms of Z's admission were as follows:

- i) Z will bring 25000 as his capital.
- ii) Goodwill of the firm is to be valued at 4 years purchase of the average super profits of the last three years. Average profits of the last three years are 20,000, while the normal profits' that can be earned on the capital employed are 12000.
- iii) Furniture is to be revalued at 24000 and the value of stock to be reduced by 20 %. Prepare Revaluation A/c, Partners capital and the Balance Sheet of the firm after admission of Z.

(Ans.....Balance C/D ... (X)39,000. (Y)27,000. (Z)17,000. Balance Sheet....97,000)

4. The Balance Sheet of X, Y & Z who were sharing profits in the ratio of 5:3:2 as at March 31, 2012.

| LIABILITIES             | AMT           | ASSETS  | AMT |
|-------------------------|---------------|---------|-----|
| Creditors.....          | 50,000        | Cash at |     |
| bank.....               | 40,000        |         |     |
| Emp Provident Fund..... | 10,000        | Sundry  |     |
| debtors.....            | 100,000       |         |     |
| P/L A/c.....            | 85,000        |         |     |
| Stock.....              | 80,000        |         |     |
| X capital.....          | 45,000        | Fixed   |     |
| Assets.....             | <u>60,000</u> |         |     |
| Y capital.....          | 62,000        |         |     |
|                         | 2,80,000      |         |     |
| Z capital.....          | <u>33,000</u> |         |     |



2,80,000

X retired on March 31 2012 and Y & Z decided to share profits in future in the ratio of 2:3 respectively

The other terms on retirement were as follows: Goodwill of the firm is to be valued at Rs. 80,000. Fixed Assets are to be depreciated to Rs. 57500. Make a provision for doubtful debts at 5 % of debtors. A liability for claim, included in creditors for Rs. 10,000, is settled at Rs. 8000. The amount to be paid to X bringing in by Y and Z in such a way that their capital are proportionate to their profit sharing ratio and leave a balance of Rs. 15,000 in the Bank Account.

Prepare Profit n Loss Adjustment Account and Partners Capital Account.

Ans. X.....1,19,750. Y.....75,800, Z.....1,13,700

5. B and C were partners sharing profits in the ratio of 3:2. Their Balance Sheet as on 31. 3. 2011 was as follows

| Liabilities      | Amt    | Assets   | Amt |
|------------------|--------|----------|-----|
| B's capital..... | 60,000 | Land &   |     |
| Building.....    | 80,000 |          |     |
| C's Capital..... | 40,000 |          |     |
| Machinery.....   | 20,000 |          |     |
| Provision for    |        |          |     |
| Cash.....        | 16,000 |          |     |
| Bad debt.....    | 1000   |          |     |
| Debtors.....     | 25,000 |          |     |
| Creditors.....   | 60,000 |          |     |
| Furniture.....   | 10,000 |          |     |
|                  | 161000 | Profit & |     |
| Loss.....        | 10,000 |          |     |
|                  | 161000 |          |     |

D was admitted to the partnership for 1/5<sup>th</sup> share in the profits on the following terms:

- The new profit sharing ratio was decided as 2:2:1
- D will bring Rs. 30,000 as his capital and 15,000 for his share of goodwill.
- Half of goodwill amount was withdrawn by the partner who sacrificed his share of profit in favour of 'D'.
- A provision of 5% for bad and doubtful debts was to be maintained.
- An item of 500 included in Sundry Creditors was not likely to be paid.



- vi) A provision of Rs. 800 was to be made for claims for damages against the firm.

After making the above adjustments the capital accounts of 'B' and 'C' were to be adjusted on the basis of D's capital. Actual Cash was to be brought in or to be paid off as the case may be. Prepare Revaluation Account, Partners Capital Accounts and Balance Sheet of the new firm.

Ans.....To Cash (B)....1170, By Cash (C).....24220

Balance Sheet.....2,10,300

**Subject: Economics**

1. How market demand schedule is derived with the help of individual demand schedules?
2. What cause an upward movement along a demand curve?
3. If the number of consumers increases, in which direction will the demand curve shift?
4. A straight line demand curve is given. What will be elasticity of demand on the midpoint of this curve?
5. Due to decrease in price of pen why does the demand of ink increase?
6. What changes will take place in total utility when-
  - (a) Marginal utility curve remains above X-axis.
  - (b) Marginal utility curve touches X-axis
  - (c) Marginal utility curve lies below X-axis.
7. State elasticity of demand of followings:
  - (a) Luxurious goods
  - (b) Goods of alternate use
  - (c) Necessity goods.
8. When price of a good is Rs. 7 per unit a consumer buys 12 units. When price falls to Rs. 6 per unit he spends Rs. 72 on the good. Calculate price elasticity of demand by using the percentage method. Comment on the likely shape of demand curve based on this measure of elasticity.
9. A consumer buys 10 units of a good at a price of Rs. 9 per unit. At price of Rs. 10 per unit he buys 9 units. What is price elasticity of demand? Use proportionate approach Comment on the likely shape of demand curve on the basis of this measure of elasticity.
10. A consumer buys 20 units of a good at a price of Rs. 5 per unit. He incurs an expenditure of Rs. 120 when he buys 24 units. Calculate price elasticity of demand of the percentage method. Comment on the likely shape of demand curve based on this information.
11. When the price of a commodity falls by Rs. 2 per unit, its quantity demanded increases by 10 units. Its price elasticity of demand is (-) 1. Calculate its quantity demanded at the price before change which was Rs. 10 per unit.
12. The price elasticity of demand of a commodity is .0.5. At a price of Rs. 20 per unit, total expenditure on it is Rs. 2,000. Its price is reduced by 10 percent. Calculate its demand at the reduced price.

13. A consumer buys certain quantity of a good at a price of Rs. 10 per unit. When price falls to Rs 8 per unit, she buys 40% more quantity. Calculate price elasticity of demand.
14. A consumer buys 11 units of a good at a price Rs 10 per unit. He can buy 13 units of the same by incurring an expenditure of Rs 130. Calculate price elasticity of demand by the percentage method. Also comment on the shape of the demand curve.
15. With the help of diagrams, explain the effect of following changes on the demand of a commodity.
- A fall in the income of its buyer.
  - A rise in price of complementary good.
  - A fall in the price of substitute goods
  - Expectation of higher price of the commodity in future.

**Subject :Psychology**

- Write the practical reports of
  - Raven's Standard Progressive Matrices (RPM)
  - Cattell's 16 Personality Factors (16 PF)
- Collect data for the case-study

**SUBJECT – ENTREPRENEURSHIP (XII)**

Project on **market survey** given to the students for class XII (commerce and arts)

**Subject: Sociology (sections E and F)**

The holiday homework issued to the students of Class XII (sections E and F) is the **CBSE Project Work**, required as partial fulfilment of the requirement of the Class XII, AISSE 2014 – 2015.

The research question, field, sample population and methodology differ with each student and have been individually addressed to in class. This break is to be utilised in collecting data and information regarding the respective topic of every individual student.

**Subject: Maths**

**CHAPTER-RELATIONS AND FUNCTIONS**

- Let  $S$  be the set of all real numbers and let  $R$  be a relation in  $S$  defined by  $R = \{(a, b) : (1 + ab) > 0\}$ . Show that  $R$  is reflexive and symmetric but not transitive.
- If  $R_1$  and  $R_2$  be two equivalence relations on a set  $A$ , prove that  $R_1 \cap R_2$  is also an equivalence relation on  $A$ .
- Let  $f : R \rightarrow R : f(x) = x^2$ ,  $g : R \rightarrow R : g(x) = \tan x$  and  $h : R \rightarrow R : h(x) = \log x$ , find a formula for

$$ho(gof). \text{ Find the value of } [ho(gof)]\sqrt{\frac{\pi}{4}}$$

4. Let  $A = \{a, b, c\}$ . Then show that the number of relations containing  $(a, b)$  and  $(b, c)$  which are reflexive and transitive but not symmetric is three.
5. Show that the number of equivalence relations in the set  $A = \{p, q, r\}$  containing  $(p, q)$  and  $(q, p)$  is two
6. Let  $A = \{1, 2, 3\}$ . Then show that the number of relations containing  $(1, 2)$  and  $(1, 3)$  which are reflexive and symmetric but not transitive is one.
7. Let  $A = \{1, 2, 3\}$ . Then show that number of equivalence relations containing  $(1, 2)$  is two.
8. Show that the number of binary operations on  $\{1, 2\}$  having 1 as identity and having 2 as inverse of 2 is exactly one.

### CHAPTER-INVERSE TRIGONOMETRIC FUNCTIONS

9. Show that  $\sin^{-1} \frac{12}{13} + \cos^{-1} \frac{4}{5} + \tan^{-1} \frac{63}{16} = \pi$
10. Evaluate:  $\cos \left\{ \cos^{-1} \left( -\frac{\sqrt{3}}{2} \right) + \frac{\pi}{6} \right\}$
11. Prove that  $\cot^{-1} 7 + \cot^{-1} 8 + \cot^{-1} 18 = \cot^{-1} 3$
12. Evaluate :  $\cos \left( \sin^{-1} \frac{3}{5} + \sin^{-1} \frac{5}{13} \right)$
13. If  $\cos^{-1} x + \cos^{-1} y + \cos^{-1} z = \pi$ , Prove that  $x^2 + y^2 + z^2 + 2xyz = 1$
14. If  $\cos^{-1} \frac{x}{2} + \cos^{-1} \frac{y}{3} = \alpha$ , then prove that  $9x^2 - 12xy \cos \alpha + 4y^2 = 36 \sin^2 \alpha$

### CHAPTER - CONTINUITY AND DIFFERENTIABILITY

15. Differentiate w.r.t.  $x$   
 $\log_5 (\log x)$
16. Differentiate w.r.t  $\sin^{-1} \left( \frac{2^{x+1}}{1+4^x} \right)$
17. For a positive constant  $m$  find  $\frac{dy}{dx}$  where  $y = m^{\frac{1}{t}}$  and  $x = \left( t + \frac{1}{t} \right)^m$
18. If  $y = \sqrt{x^2 + 1} - \log \left\{ \frac{1}{x} + \sqrt{1 + \frac{1}{x^2}} \right\}$ , then find  $\frac{dy}{dx}$
19. If  $x \sin(a + y) + \sin a \cdot \cos(a + y) = 0$ , then prove that  $\frac{dy}{dx} = \frac{\sin^2(a + y)}{\sin a}$
20. If  $\cos^{-1} \left( \frac{x^2 - y^2}{x^2 + y^2} \right) = \tan^{-1} a$ , prove that  $\frac{dy}{dx} = \frac{y}{x}$

21. Find  $\frac{dy}{dx}$  if  $y = x^{x^x}$ .
22. If  $y = \sqrt{\sin x + \sqrt{\sin x + \sqrt{\sin x + \dots \infty}}}$ , prove that  $\frac{dy}{dx} = \frac{\cos x}{2y-1}$
23. Find the differential coefficient of  $\tan^{-1}\left(\frac{\sqrt{1+x^2}-1}{x}\right)$  w.r.t  $\tan^{-1} x$ ,  $x \neq 0$
24. If  $y = x \log\left(\frac{x}{a+bx}\right)$ , prove that  $x^3 \frac{d^2 y}{dx^2} = \left(x \frac{dy}{dx} - y\right)^2$ .
25. Find the value of  $a$  for which the function  $f$ , defined as
- $$f(x) = \begin{cases} a \sin \frac{\pi}{2}(x+1), & x \leq 0 \\ \frac{\tan x - \sin x}{x^3}, & x > 0 \end{cases}$$
- is continuous at  $x = 0$ .

**Subject : Geography**

1. ASSIGNMENT FOR CHAPTERS 1 TO 6 (Pg. 194-95, Academic Window) & CHAPTERS 1 TO 4 (Pg. 196-97, Academic Window)
  2. MAP WORK
    - a. For Identification
    - b. For locating and labeling
- Refer to Academic Window and insert the map items on the outline political map of World and India (in separate files).

**Subject: Political Science**

Chapter7: Security in the contemporary world (Q5-Q9)  
 Chapter8: Environment and natural resources (Q6-Q9)  
 Chapter 9: Globalisation (Q5-Q10)

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