

## **HOLIDAYS' HOMEWORK-XII Commerce**

### **SUMMER VACATION (2025-26)**

#### **SUBJECT - ENGLISH (XII)**

**1.Design handmade colorful comic strips exhibiting the summary of following fictions (Do any two ):-**

- a. Lost Spring    b. The Last Lesson    c. The Tiger King    d. Deep Water

**Ruberics For Assessment: Originality, Creativity and Presentation.**

**2. Make a creative power point presentation on Fiction/ Poetry assigned by teacher in class. It should include 10 to 12 slides. Also add following things.....**

- a. Author's/Poet's Introduction and achievements
- b. Theme, Central Idea, Message
- c. Brief summary of the poem/fiction.
- d. Poetic/literary Devices Used

**Ruberics for Assessment: Creativity/Originality , Content and Presentation.**

**3. Complete the assignment provided along with the Holidays' Homework and paste in your English Notebook . Revise the entire topics of English syllabus covered till date.**

**4. Read about writers/poets (Covered Till Date) and prepare a table calendar/Portfolio, which would include:**

- \*Coloured picture    \*Genre and era they belonged to
- \*Personal life    \*education    \*Literary works    \*Achievements
- \*Synopsis Of Fiction/Poet prescribed in Syllabus

**SUMMER HOLIDAY HOMEWORK 2025-26**  
**CLASS-XII – BUSINESS STUDIES**  
**Case studies - Chapter 1, 2 &3**



**Instructions:**

- 1) Stay Motivated and think as if you are a manager or owner of one company while doing followi
- 2) Do only two case studies daily
- 3) Do the case studies in class work notebook only

Progressive School, to take a loan from State Bank of India to experiment and develop cars to be powered by fuel produced from garbage. He developed such a car and exhibited it in the Science Fair organised by the Directorate of Education. He was awarded the first prize for his invention.

Identify and explain the dimensions of business environment discussed in the above case.

Q2 After completing her MBA, Beni took up a job with a multinational company named Fortio. The company paid good salaries and perks to its employees. The wages were within the paying capacity of the company that provided the employees with a reasonable standard of living. The company also had a good work-culture and the behaviour of superiors was very good towards their subordinates. Beni was very happy in this organisation but due to long working hours, she did not have time to cook her meals.

She had to depend upon outside food which was deteriorating her health.

She observed that this problem was faced by many of her colleagues, not only in her company but also in many other companies. This was because of increase in the number of working women and non-availability of hygienic home-cooked food. She identified this as a great opportunity and decided to give up her job to supply packaged home-cooked food to office-goers at a reasonable price. At the end of the day, she also distributed the leftover food to the nearby night-shelters.

|                           |                        |
|---------------------------|------------------------|
| <b>S</b><br>Strengths     | <b>W</b><br>Weaknesses |
| <b>O</b><br>Opportunities | <b>T</b><br>Threats    |

1. State the dimension of business environment being discussed above.
2. State the principle of management being followed by Fortio.
3. Identify any two values being communicated by the company to society in above case.

Q3 Rajveer works as a plant superintendent in a carpet making factory. In order to complete the export orders on time, the production manager asks him to make the workers work over time whereas the finance manager is strictly against this practice because it will increase the cost of production. Moreover, Rajveer feels that since the company is manufacturing handmade carpets as well as machine made carpets there is a lot of overlapping of activities. Therefore, there should be two separate divisions for both of them wherein each division should have its own in charge, plans and execution resources.

In context of the above case:

1. Identify and explain the principle of management which is being violated.
2. Also identify the principle of management that Rajveer feels should be implemented in the factory.
3. Give any two differences between the principle of management as identified in part (a) and part (b) respectively.

Q4 Neeraj is selected for the post of software developer in an IT Company. On the first day of his joining Mehul, his project manager tells Neeraj that during the course of his work he will come across many such opportunities which may tempt him to misuse his powers for individual or family's benefit at the cost of larger general interest of the company. In such situations, he should rather exhibit exemplary behaviour as it will raise his stature in the eyes of the company. Also, for interacting with anyone in the company on official matters, he should adopt the formal chain of authority and communication.

In context of the above case:

1. Identify and explain the various principles of management that Mehul is advising Neeraj to follow while doing his job.
2. List any two values that Mehul wants to communicate to Neeraj.

Q5 Sridhar's father is working as a section in-charge in a government office. Identify the level of management at which he is working? State any five functions that he has to perform at this level.

Q6 Ramarjuna joins an IT firm as a system analyst after completing his masters in Computer Science. As the nature of his work demands he has to work in very close coordination with all the departmental heads in the firm, very soon Ramarjuna realizes that each departmental head has own individual style of working. They differ greatly in their day-to-day approach to work. They tend to deal with a given situation, an issue or a problem through a combination of their own experience, creativity, imagination, initiative and innovation.

In the context of the above case:

Identify and explain the nature of management highlighted in the above case.

Q7 Gurpreet is running a retail mart in Varanasi to provide various types of products of daily use under one roof to the buyers. The employee turnover in his business is very high and he is perpetually on a look out for new staff. The fact of the matter is that he lacks managerial skills and assigns work to his employees on adhoc basis without letting them settle down in a specific work. This approach of his creates a sense of insecurity among the employees and they tend to leave the job very quickly. However, he is a very god fearing person and offers fair wages to his employees so they can afford a reasonable standard of living.

In context of the above case:

1. Identify and explain the principle of management which Gurpreet is unable to apply and is perpetually on a look out for new staff.
2. "He is a very god fearing person and offers fair wages to his employees so they can afford a reasonable standard of living." Name and explain the relevant principle of management will has been brought into effect by Gurpreet.

Q8 On 8 November 2016, the Government of India announced the demonetisation making all Rs.500 and Rs. 1,000 banknotes of the Mahatma Gandhi Series invalid past midnight. The government claimed that the action would curtail the use of illicit and counterfeit cash to fund illegal activity and terrorism. The BSE SENSEX and NIFTY 50 stock indices fell over 6 percent on the day after the announcement. The decision was heavily criticised by members of the opposition parties, leading to debates in both houses of parliament and triggering organised protests against the government in several places across India. People seeking to exchange their bank notes had to stand in lengthy queues, and several deaths were linked to the inconveniences caused due to the rush to exchange cash. After demonetisation the demand for point of sales

(POS) or card swipe machines has increased. E-payment options like PayTM has also seen a rise. In context of the above case:

1. Identify and explain the various dimensions of business environment which relate to the above mentioned case.
2. List any through two values that the government seeks to promote through demonetisation.

Q9 Post demonitisation in a further push to cashless economy, the Central cabinet has recently approved the ordinance for paying wages via electronic means. Accordingly, the government approved to Amend Section 6 of the Payment Of Wages Act 1936, to allow employers of certain industries to make payment through the electronic mode and cheques . The new ordinance will be applicable to the public sector. Identify the various dimensions of business environment which relate to the above mentioned case.

Q10 Nikita and Salman completed their MBA and started working in a multinational company at the same level. Both of them worked hard and were happy with their employer. Salman had the habit of back-biting and wrong reporting about his colleagues to impress his boss. All the employees in the organisation knew about it. At the time of performance appraisal, the performance of Nikita was judged to be better than Salman. Even then their boss, Mohammed Sharif, decided to promote Salman stating that being a female, Nikita would not be able to handle the complications of a higher post.

1. Identify and explain the principle of management which was not followed by this, multinational company.
2. Identify the values which are being ignored quoting the lines from the above paragraph.

Q11 A floor manager of a mall is a very good manager as he utilizes all the functions of management to minimize cost of maintenance of his area. He directs all the staff members under him to follow the targets and advises them to put their efforts in the direction of achievement of these targets. Under his guidance the employees admit that they learn a lot and are able to meet their targets. This has led to the increase in their salaries. Identify the importance of management highlighted above.

Q12 Identify the various dimensions of business environment:

1. With the election of a new government the sensex drops by 748 points.
2. A particular channel refrains from showing the advertisement of a particular product as it is banned by the government.
3. A software is in high demand among the industrial buyers as it can connect all the branches of a company as a single integrated unit.
4. At the time of holi a large number of manufacturing firms get involved in making colours which are used in the celebration of this colourful festival.
5. It is not advisable to open a luxury car showroom in the middle of an economy where per capita income is very low.

Q13 “World Softwares” is a software giant. It has many branches throughout the world. The company knows that it has great opportunities in its path. When it it was limited only to its native country. With the passage of time within 20 years the economies of various countries have integrated. This has come as a great advantage to this company which has expanded. In many of the countries where it has its, branches the

control of government in the public sector enterprises has diluted leading to more control in the hands of the private sector. One of the major reasons for the success of the company has been the role of the initiator the company has played as it was the first company of its kind to enter the market. Identify the two important concepts highlighted above. Which type of advantage has been indicated in the last line of the above case?

- Q14 Radio XYZ is a company which has improved its functioning by proper management. The company has been good in fixing and completing targets. The main reason for its success has been the involvement of all of the employees. The company tries to keep its targets in front of the employees so that each one of them can contribute to the completion of goals. Though their activities may be different yet they contribute to the common targets or goals of the organisation. The company has won the prize for the best organisational climate. This has been possible due to the impact of great managerial discipline which might not be visible to an outsider in the first look but he realises it when he stays in the organisation. Gradually the organisation has developed itself into a very successful company. It has produced different types of radios according to the needs of the customers. During last decade it has adapted to the requirements of the market and produced different type of radios suiting the needs of the customers. The management of three components is always significant to the company — employees, process and amount of work to be done. Controlling these three areas is always a top priority to the company. Recently a meeting was held which laid stress on the need of taking good management to all levels and departments of the organisation. In the above case find all the characteristics of management and highlight the lines which help you identify them.
- Q15 ABCDEF Ltd. decided to start its new venture in Delhi. For this they needed to understand the Business Environment of the area. It was realised by the company that the Business Environment of Delhi was very hard to understand unless and until it was divided into different business dimensions like legal, political, economic, social and technological conditions. After understanding the business situations the company started to study the close links between different elements of the Business Environment. They gave a proper shape to their research and the business got started with full force. Later they realised that the products they were selling in Delhi were more fit for the European culture and decided to start a new branch in Belgium where the demand of their products was very high from the first day. The company came to be recognized and in few years became a global brand. The reason for its success in different countries was the adaptability' it showed in meeting the changing environment. The company kept track of all happenings and did a periodic survey of the choices of the customers. It recognized that there was no surety in the nature of market and it was very unpredictable. Which features of Business Environment have been highlighted in the above case? Identify the lines which highlight these features.
- Q16 With change in the consumption habits of people, Neelesh, who was running a sweets shop shifted to chocolate business. On the eve of Diwali he offered chocolates in attractive packages at reasonable prices. He anticipated huge demand and created a website chocolove.com for taking orders online. He got lot of orders online and earned huge profit by selling chocolates. Identify and explain the dimensions of business environment discussed in the above case.

- Q17 'Raise the Bar' is a sports equipment company. It has different branches in different parts of the world. However, the requirements of the sports equipments are different in different branches. This is due to the change in cultures and lifestyles of people in the different countries. The market in which it is dealing is known for awareness of health. The more the awareness the more is the demand for such equipments. Company knows that the demand for these products is unpredictable as new designs keep on coming and the industry keeps on changing frequently. There is a Research and Development Department which keeps on updating the equipments in material and design. However the outside business environment is characterized by changing customer preferences, entry of new competitors making it change. A meeting was organized recently to understand the external business environment. However, after the meeting it was realised that business environment can't be understood in totality it can only be understood by breaking it into its dimensions. The result of a successful meeting could be seen later in the performance of the company which created record sales in the coming year.  
Identify the features of business environment highlighted here.
- Q18 A recent rate cut in the interest on loans announced by the Banks encouraged Amit, a science student of Progressive School to take a loan from State Bank of India to experiment and develop cars to be powered by fuel produced from garbage. He developed such a car and exhibited it in the Science Fair organized by Directorate of Education. He was awarded first prize for his invention.  
Identify and explain the dimensions of business environment discussed in the above case.
- Q19 Rajveer works as a plant superintendent in a carpet making factory. In order to complete the export orders on time, the production manager asks him to make the workers work over time whereas the finance manager is strictly against this practice because it will increase the cost of production. Moreover, Rajveer feels that since the company is manufacturing handmade carpets as well as machine made carpets there is a lot of overlapping of activities. Therefore, there should be two separate divisions for both of them wherein each division should have its own in charge, plans and execution resources.  
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### **Subject: Accountancy**

1. Visit any Bank Branch nearby you, observe the functioning and prepare financial statements with all other important Sub Accounts.

#### **Solve the questions of Issue of Shares:**

- Q1. Define Shares?
- Q2. Define Authorized Capital and Issued Capital?
- Q3. Differentiate between Equity Shares and Preference Shares?
- Q4. Venture Ltd. issues 10000 equity shares of ₹100 each. The amount payable is as follows:  
Jan 1, 2018, On Application ₹20  
Feb 1, 2018, On Allotment ₹50

Mar 1, 2018, On First and Final Call ₹30.

Show necessary journal entries in the following cases:

The company receives applications for 10000 shares and duly allots all shares.

Q5. Sahni Ltd. issues 10000 equity shares of ₹100 each at 25% premium. Premium is due at time of allotment. The amount payable is as follows:

Jan 1, 2018: On Application ₹20

Feb 1, 2018: On Allotment ₹75

Mar 1, 2018: On First and Final Call ₹30.

The company makes allotment properly. Show necessary journal entries.

### **Subject: Economics**

**1. Which of the following is the credit money?**

- (A) Cheque and draft
- (B) Promissory note
- (C) Exchange note
- (D) All of these

**2. In order to encourage investment in the economy, the Central Bank may \_\_\_\_\_**

- (A) Reduce Cash Reserve Ratio
- (B) Increase Cash Reserve Ratio
- (C) Sell Government securities in the open market
- (D) Increase Bank Rate

**3. Institution that accepts deposits for lending purpose is known as \_\_\_\_\_**

- (A) Commercial Bank
- (B) Central Bank
- (C) Government
- (D) Public

**4. Who circulates all mint and one rupee note in India?**

- (A) Ministry of Finance
- (B) RBI
- (C) Ministry of External Affairs
- (D) State Government

**5. Which of the following is not a phase of Circular Flow of income?**

- (a) Production Phase                      (b) Income phase
- (c) Expenditure phase                      (d) Growth phase

**6. In closed economy, which of the following Sectors is not included?**

- (a) Household                                  (b) Local Firms
- (c) Local Government                      (d) Rest of the world

**7. Which of the following is not a Flow Concept?**

- (a) Capital                                      (b) Capital Formation
- (c) Income                                      (d) Depreciation

**8. "Real flow" refers to the flow of : –**

- (a) Goods and services across different sector of the economy                      (b) Emotions
- (c) Factor services from household sector to the producer sector                      (d) Both A and C

**9. Which of the following is a “Stock Concept” ?**

- (a) Population                      (b) Wealth  
(c) Capital                         (d) All of the above

**10. Indian Monetary System is based on \_\_\_\_\_**

- (A) Paper Standard  
(B) Metallic Standard  
(C) Gold Standard  
(D) Credit Money Standard

### **SECTION-B**

**Q11.** Distinguish between consumption goods and capital goods.

**Q12.** State whether the following is stock or flow with reasons:

1. Money supply                      2. Capital                      3. Wealth                      4. Investment                      5. Income

**Q13.** All capital goods are producer goods. Why?

**Q14.** Explain non-monetary exchanges as a limitation of using gross domestic product as an index of welfare of a country?

**Q15.** Should the following be treated as normal resident of India? Give reasons.

1. Foreigner working in Indian embassy in UK  
2. Indian student in France who has been living there for five years

**Q16.** The government of India has launched a scheme of “cash transfer” to the people below poverty line. Would you consider these transfers as a part of domestic income of the country.

**Q17.** Explain non-monetary exchanges as a limitation of using gross domestic product as an index of welfare of a country?

**Q18.** Differentiate between national income at current prices and national income at constant prices. Which of the two presents a better view of the economic growth of economy and why?

**Q19.** Define Externalities. Give an example of negative externality. What is its impact on welfare?



# PSYCHOLOGY HOLIDAY HOMEWORK-XII

Written report of the following files to be completed:

- (i) Case Study
- (ii) Practical file

## HOLIDAY HOMEWORK ASSIGNMENT

General Instructions:

- Neatly write all the answers in your notebook.
- Attempt the questions keeping in mind the weightage of each question.

### WEEK 1

- Q1. Define self.(1)
- Q2. In value assessment we try to determine the \_\_\_\_\_ values of a person. (1)
- Q3. Define personality. (1)
- Q4. People who are confident, can solve problems, confront the things that frighten them and nurture themselves are all qualities of which Behavioural aspect of self. Write a note on it. (3)
- Q5. Rita is learning music. Many times, she has to miss her favourite serial as she has to go for music classes. Also, she wakes up early to practice despite her love her sleep. Which concept from the chapter self and personality can you link to this situation? (4)
- Q6. Which concept of self is based on Bandura's social learning theory? Write a note on it. (2)
- Q7. If a psychologist is evaluating you by asking your response to ink blots, which form of assessment is the psychologist using? List any two features of this form of assessment.(3)
- Q8. Is there difference between self-actualization and a fully functioning individual? Support your answer with the help of examples. (3)
- Q9. Distinguish between type and trait approach of personality. Give suitable examples. (6)
- Q10. What is meant by delay in gratification? Discuss the technique used for self-control. (4)

### WEEK 2

- Q1. Intelligence tests provide a \_\_\_\_\_ of a person's general cognitive competence including the ability to profit from schooling.(1)
- Q2. Aptitude tests are used to predict what an individual will be able to do if given proper \_\_\_\_\_ and \_\_\_\_\_. (1)
- Q3. Define intellectual deficiency.( 2)
- Q4. What is Buddhi?( 2)
- Q5. State the characteristics of individuals with type A personality.( 2)
- Q6. You have assessed 20 peers of your class for mathematical comprehension/ knowledge. Create a distribution for the results you are most likely to expect. What is the shape of this distribution? (2)
- Q7. The evidence for hereditary influences on intelligence comes mainly from studies of twins and adopted children. With respect to the role of environment, studies have reported that as children grow in age, their intelligence level tends to move closer to their adopted parents. Children from disadvantaged home adopted into families of higher socio-economic status exhibit in a large increase in their intelligence scores. There is evidence that environmental deprivation lowers intelligence while rich nutrition, good family background and quality schooling increases intelligence. There is a general consensus among psychologists that intelligence is the

product of complex interaction of heredity and environment. Heredity can be viewed as something that sets a range within which an individual's development is shaped by the support and opportunities of the environment. Studies have also shown correlation between twins reared together (.60) and siblings reared together (.50) and sibling reared apart (.25) to share intelligence.

- i. As children grows in age, their\_\_\_\_\_ tends to closer to their adoptive parents.(1)  
a. Moral value b. Mental level c. Intelligence level d. All the above
  - ii. Environmental deprivation lowers\_\_\_\_\_ (1)  
a. Insight Ness b. Intelligence c. wisdom d. None of the above
  - iii. The evidence for the hereditary influences on intelligence comes mainly from(1)  
a. studies of twins b. studies of adopted children c. both a & b d. neither a & nor b
  - iv. children from disadvantaged homes adopted into families of higher socio-economics status exhibit a large increase in their \_\_\_\_\_. (1)  
a. educational status b. intelligence scores c. social status d. All the above
- Q8. Rehaan is good at solving mathematical problems. Which intelligence according to Gardener would he excel in? Write the key characteristics of multiple intelligence. (4)
- Q9. How do Alfred Adler and Karen Horney Explain personality development? (4)

### WEEK 3

- Q1. Shweta has been writing for the school magazine and would like to pursue journalism. Which intelligence is her skill reflecting? (1)
- Q2. \_\_\_\_\_ are enduring beliefs about an ideal mode of behaviour. (1)
- Q3. High ability, creativity and commitment are found in individuals with which intelligence? (2)
- Q4. Does heredity influence intelligence? (2)
- Q5. Write a note on the test that can be given only to literate groups based on the type of items. (2)
- Q6. Shirin learnt an answer and was able to recall it exactly the way it had been learnt. According to Arthur Jensen what level of learning she is using? (2)
- Q7. Psychological attributes are multi-dimensional. Describe any three such attributes. (3)
- Q8. What are some of the erroneous practices associated with intelligence testing? (4) Q9. Which intelligence is associated with Indian culture? Write a detailed note on the same.( 4)
- Q10.Explain "Maslow's humanistic approach keeping in mind an individual who is feeling low.( 4)

### WEEK 4

- Q1. A person having a \_\_\_\_\_ sets a standard for guiding her/his actions in life and for judging others. (1)
- Q2. \_\_\_\_\_ refers to an individual's underlying potential for acquiring skills. (1)
- Q3. Aditya has to interview, a famous politician on a live T.V. show. Which is the most appropriate type of interview he can use? (2)
- Q4. Why is emotional intelligence receiving increasing attention of educators? (2)
- Q5. Describe key feature of the case study method. (2)
- Q6. Angad has been the topper in a class. He went to the topmost college, where he was neither sensitive to his own self or to others. This led to problems in interpersonal relationships with reference to his condition. Explain the importance of the emotional intelligence in his life.( 2)
- Q7. Think of an international conflict. Suggest conflict resolution strategies for the same. (3)
- Q8. Explain the competencies of Indian notion of intelligence.( 4)

Q9. How is aptitude different from intelligence? Explain how the PASS model helps us to understand intelligence. (4)

Q10. Explain the relationship between creativity and intelligence. (4)

Q11. Describe behavioural ratings used in the assessment of personality. Explain the major limitations in using these ratings. (6)

Q12. According to Freud, individuals avoid anxiety by using mechanisms that protect the ego by distorting reality. What are these mechanisms called ? Explain its different kinds with the help of examples. (4)

Q13. Anand wants to become musician even though he belongs to the family of doctors. He wishes to fulfil his potential. Using Carl Roger's terminology, describe this perspective as revealed by Anand's personality. (4)

Q14. Describe Freud's psychosexual stages of personality development. (6)

# HOLIDAY HOMEWORK

## ASSIGNMENT CLASS XII DIFFERENTIATION

1. Find  $\frac{dy}{dx}$  for the following:

(a)  $y = \frac{1}{\sqrt{a^2 - x^2}}$

(b)  $y = \frac{5x}{\sqrt[3]{1-x^2}} + \sin^2(2x+3)$

(c)  $y = \frac{\cos x + \sin x}{\cos x - \sin x}$

(d)  $y = \log \sqrt{\frac{1+\cos^2 x}{1-e^{2x}}}$

(e)  $y = \log(x + \sqrt{1+x^2})$

(f)  $y = \sqrt{\frac{1-\sin 2x}{1+\sin 2x}}$

2. Show that  $\frac{d}{dx} \left[ \frac{x}{2} \sqrt{a^2 - x^2} + \frac{a^2}{2} \sin^{-1} \left( \frac{x}{a} \right) \right] = \sqrt{a^2 - x^2}$ .

3. If  $y = \sqrt{\frac{1-x}{1+x}}$ , prove that  $(1-x^2) \frac{dy}{dx} + y = 0$ .

4. If  $y = (x + \sqrt{x^2 + a^2})^n$ , prove that  $\frac{dy}{dx} = \frac{ny}{\sqrt{x^2 + a^2}}$ .

5. Find  $\frac{dy}{dx}$  for the following:

(a)  $\sin^{-1}(\cos x) + \cos^{-1}(\sin x)$

(b)  $\tan^{-1} \left( \frac{1 - \cos x}{\sin x} \right)$

(c)  $\tan^{-1} \left( \frac{\cos x - \sin x}{\cos x + \sin x} \right)$

(d)  $\tan^{-1} \left( \sqrt{\frac{1+\sin x}{1-\sin x}} \right)$

(e)  $\tan^{-1} \left( \frac{\sqrt{1+\sin x} + \sqrt{1-\sin x}}{\sqrt{1+\sin x} - \sqrt{1-\sin x}} \right)$

6. Find  $\frac{dy}{dx}$  for the following:

(a)  $\cos^{-1}(4x^3 - 3x)$

(b)  $\cot^{-1} \left( \frac{1-x}{1+x} \right)$

(c)  $\tan^{-1} \left( \frac{\sqrt{1+x^2} - 1}{x} \right)$

(d)  $\tan^{-1} \left( \frac{\sqrt{1+x^2} - \sqrt{1-x^2}}{\sqrt{1+x^2} + \sqrt{1-x^2}} \right)$

(e)  $\sin^{-1} \left( \frac{5x+12\sqrt{1-x^2}}{13} \right)$

7. If  $\sqrt{1-x^2} + \sqrt{1-y^2} = a(x-y)$ , prove that  $\frac{dy}{dx} = \sqrt{\frac{1-y^2}{1-x^2}}$ .

8. If  $y = \sqrt{x} + \frac{1}{\sqrt{x}}$ , prove that  $2x \frac{dy}{dx} + y = 2\sqrt{x}$ .

9. If  $y\sqrt{x^2+1} = \log(\sqrt{x^2+1}-x)$ , show that  $(x^2+1) \frac{dy}{dx} + xy + 1 = 0$ .

10. If  $y \log x = x - y$ , prove that  $\frac{dy}{dx} = \frac{\log x}{(1 + \log x)^2}$ .

11. If  $\log(\sqrt{x^2 + y^2}) = \tan^{-1} \frac{y}{x}$ , prove that  $\frac{dy}{dx} = \frac{x + y}{x - y}$ .

12. If  $y = \frac{\sin^{-1} x}{\sqrt{1 - x^2}}$ , prove that  $(1 - x^2) \frac{dy}{dx} = xy + 1$ .

13. If  $y = x^{\cos x} + \cos x^{\sin x}$ , find  $\frac{dy}{dx}$ .

14. If  $x^a y^b = (x + y)^{(a+b)}$ , prove that  $\frac{dy}{dx} = \frac{y}{x}$ .

15. If  $f(x) = \left(\frac{3+x}{1+x}\right)^{2+3x}$ , find  $f'(0)$ .

16. Differentiate  $\tan^{-1}\left(\frac{2x}{1-x^2}\right)$  w.r.t.  $\sin^{-1}\left(\frac{2x}{1+x^2}\right)$ .

17. If  $x = a \sin 2t(1 + \cos 2t)$ ,  $y = b \cos 2t(1 - \cos 2t)$ , show that  $\left(\frac{dy}{dx}\right)_{at=\frac{\pi}{4}} = \frac{b}{a}$ .

18. If  $x = a\left(\frac{1+t^2}{1-t^2}\right)$ ,  $y = \frac{2t}{1-t^2}$ , show that  $\frac{dy}{dx} = \frac{1+t^2}{2at}$ .

19. If  $x = 2 \cos \theta - \cos 2\theta$  and  $y = 2 \sin \theta - \sin 2\theta$ , find  $\left(\frac{d^2y}{dx^2}\right)_{\theta=\frac{\pi}{2}}$ .

20. If  $y = A \cos nx + B \sin nx$ , prove that  $\frac{d^2y}{dx^2} + n^2 y = 0$ .

21. If  $y = e^x (\sin x + \cos x)$ , prove that  $\frac{d^2y}{dx^2} - 2 \frac{dy}{dx} + 2y = 0$ .

22. If  $y = \tan^{-1} x$ , show that  $(1 + x^2) \frac{d^2y}{dx^2} + 2x \frac{dy}{dx} = 0$ .

23. If  $y = \left[\log\left(x + \sqrt{x^2 + 1}\right)\right]^2$ , show that  $(1 + x^2) \frac{d^2y}{dx^2} + x \frac{dy}{dx} = 2$ .

### Application of Derivatives

1. Water is dripping out from a conical funnel of semi vertical angle  $\frac{\pi}{4}$  at a uniform speed of  $2 \text{ cm}^3 / \text{sec}$  through a tiny hole at the vertex of the bottom. When the slant height of water is 4cm , find the rate of decrease of slant height of the water.
  2. A man is moving away from a tower 49.6 m high at the rate of 2 m/s. Find the rate at which the angle of elevation of the top of the tower is changing, when he is at a distance of 36 m from the foot of the tower. Assume that the eye level of the man is 1.6 m from the ground.
  3. Evaluate following up to three decimal places using differentiation:  
 $\sqrt{25.2}$ ,  $\sqrt[3]{29}$  ,  $\sqrt{0.037}$
  4. Find the intervals in which the function  $f(x) = \log(1+x) - \frac{2x}{2+x}$  is increasing or decreasing.
  5. Find the intervals in which the function  $f(x) = (x+1)^3 (x-3)^3$  is increasing or decreasing. Also find the points at which the function has local maxima, local minima and the point of inflexion.
  6. Find all the points of local maximum and minimum and the corresponding maximum and minimum values of the following function  $\frac{3}{4}x^4 - 8x^3 + \frac{45}{2}x^2 + 105$ .
  7. Find the point on the curve  $y^2 = 4x$  which is nearest to the point  $(2, -8)$
  8. Find the equation of the tangent to the curve  $y = (x^3 - 1)(x - 2)$  at the points where the curve cuts the x-axis.
  9. Find the intervals in which the function  $f(x) = 2x^3 - 9x^2 + 12x + 15$  is increasing and decreasing.
  10. Separate  $\left[0, \frac{\pi}{2}\right]$  into sub intervals in which  $f(x) = \sin^4 x + \cos^4 x$  is increasing or decreasing.
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11. Find the points of local maxima and local minima and also the local maximum and local minimum values of the following functions : (i)  $f(x) = 2\cos x + x, x \in (0, \pi)$   
(ii)  $f(x) = 2\sin x - x, x \in \left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$
12. Find the equation of the tangent and normal to the curve  
 $x = 1 - \cos \theta, y = \theta - \sin \theta$  at  $\theta = \frac{\pi}{4}$
13. Prove that the radius of the right circular cylinder of greatest curved surface area which can be inscribed in a given cone is half of that of cone.
14. An open box with a square base is to be made of given iron sheet of area 27 sq.m. Show that the maximum volume of the box is 13.5 cu. m.
15. Show that the triangle of maximum area that can be inscribed in a given circle is an equilateral triangle.
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## ASSIGNMENT CLASS XII INDEFINITE INTEGRALS

Evaluate the following Integrals:

1.  $e^{x \log a} + e^{a \log x} + e^{a \log a}$
2.  $\frac{1}{1 + \cos x}$
3.  $\frac{\sin x}{1 + \sin x}$
4.  $\tan^{-1}(\sec x + \tan x)$
5.  $\frac{\sin^6 x + \cos^6 x}{\sin^2 x \cos^2 x}$
6.  $\tan^{-1} \sqrt{\frac{1 - \sin x}{1 + \sin x}}$
7.  $\frac{1}{\sqrt{3x+4} - \sqrt{3x+1}}$
8.  $\frac{x^3}{x+2}$
9.  $\sin^3 x \cos^3 x$
10.  $\cos^4 x$
11.  $\cos 2x \cos 4x$
12.  $\frac{x^4 + 3}{x^2 + 1}$
13.  $\sin 4x \cos 7x$
14.  $\frac{1 + \cos x}{1 - \cos x}$
15.  $\frac{e^x - e^{-x}}{e^x + e^{-x}}$
16.  $\frac{\sin 2x}{a^2 \sin^2 x + b^2 \cos^2 x}$
17.  $\frac{\sin x}{\sin(x-a)}$
18.  $\frac{1}{\sin(x-a) \sin(x-b)}$
19.  $\frac{1 - \cot x}{1 + \cot x}$
20.  $\frac{1}{e^x + 1}$
21.  $\frac{1}{\sqrt{x}(\sqrt{x} + 1)}$
22.  $\frac{\sin 2x}{(a + b \cos x)^2}$
23.  $\frac{\sec^2(2 \tan^{-1} x)}{1 + x^2}$
24.  $\sin^2 x \cos^5 x$
25.  $\sin^5 x$
26.  $\tan^3 x$
27.  $\left(\frac{x+1}{x}\right)(x + \log x)^2$
28.  $\frac{\cos^5 x}{\sin x}$
29.  $\frac{1}{\sqrt{9 - 25x^2}}$
30.  $\frac{x^4 + 1}{x^2 + 1}$
31.  $\frac{1}{3 + 2x - x^2}$
32.  $\frac{1}{x^2 + 8x + 20}$
33.  $\frac{e^x}{e^{2x} + 6e^x + 5}$
34.  $\frac{1}{x(x^n + 1)}$
35.  $\frac{x}{x^4 - x^2 + 1}$
36.  $\frac{1}{\sqrt{9 + 8x - x^2}}$
37.  $\frac{1}{\sqrt{16 - 6x - x^2}}$
38.  $\frac{2x}{\sqrt{1 - x^2 - x^4}}$
39.  $\frac{2x - 3}{x^2 + 3x - 18}$
40.  $\frac{2 \sin 2\phi - \cos \phi}{6 - \cos^2 \phi - 4 \sin \phi}$
41.  $\frac{x + 2}{2x^2 + 6x + 5}$
42.  $\frac{x^2}{x^2 + 6x + 12}$
43.  $\sqrt{\frac{a-x}{a+x}}$
44.  $\frac{3x + 1}{\sqrt{5 - 2x - x^2}}$
45.  $\frac{1}{a^2 \sin^2 x + b^2 \cos^2 x}$
46.  $\frac{\sin x}{\sin 3x}$
47.  $\frac{1}{2 - 3 \cos 2x}$
48.  $\frac{\sin 2x}{\sin^4 x + \cos^4 x}$
49.  $\frac{1}{1 - 2 \sin x}$
50.  $\frac{1}{5 + 4 \cos x}$
51.  $\frac{1}{3 + 2 \sin x + \cos x}$
52.  $\frac{3 \sin x + 2 \cos x}{3 \cos x + 2 \sin x}$
53.  $(\log x)^2$
54.  $\sin^{-1} x$
55.  $\frac{x - \sin x}{1 - \cos x}$
56.  $\sec^3 x$



57.  $\frac{\sin^{-1} x}{(1-x^2)^{3/2}}$       58.  $x^2 \tan^{-1} x$       59.  $\tan^{-1}\left(\frac{2x}{1-x^2}\right)$       60.  $\frac{\sin^{-1} x}{x^2}$
61.  $e^x \left(\frac{1-\sin x}{1-\cos x}\right)$       62.  $\frac{\log x}{(1+\log x)^2}$       63.  $\frac{2-x}{(1-x)^2} e^x$       64.  $\frac{1}{\log x} - \frac{1}{(\log x)^2}$
65.  $e^{ax} \cos bx$       66.  $\sqrt{7x-10-x^2}$       67.  $\frac{\sqrt{16+(\log x)^2}}{x}$       68.  $(3x-2)\sqrt{x^2+x+1}$
69.  $(x+1)\sqrt{1-x-x^2}$       70.  $\frac{2x-1}{(x-1)(x+2)(x-3)}$       71.  $\frac{1}{\sin x - \sin 2x}$       72.  $\frac{3x+1}{(x-2)^2(x+2)}$
73.  $\frac{8}{(x+2)(x^2+4)}$       74.  $\frac{x^2}{(x^2+1)(x^2+4)}$       75.  $\frac{\tan \theta + \tan^3 \theta}{1 + \tan^3 \theta}$       76.  $\frac{\sin 2x}{(1+\sin x)(2+\sin x)}$
77.  $\frac{1}{x(x^5+1)}$       78.  $\frac{x^2-1}{x^4+x^2+1}$       79.  $\frac{x^2+4}{x^4+16}$       80.  $\frac{1}{x^4+1}$
81.  $\sqrt{\tan x}$       82.  $\sqrt{\cot x}$       83.  $\frac{1}{\sin^4 x + \cos^4 x}$       84.  $\frac{x^2-1}{x^4+1}$
85.  $\frac{1}{(x-3)\sqrt{x+1}}$       86.  $\frac{1}{(x^2-4)\sqrt{x+1}}$       87.  $\frac{1}{(x+1)\sqrt{x^2-1}}$       88.  $\frac{1}{x^2\sqrt{1+x^2}}$
89.  $\frac{x}{x^3+x^2+x+1}$       90.  $\frac{\sin(x-\alpha)}{\sin(x+\alpha)}$       91.  $\frac{(x+1)e^x}{(x+2)^2}$       92.  $\frac{1-\tan x}{x+\log(\cos x)}$
93.  $\frac{\sqrt{x^2+a^2}}{x}$       94.  $\frac{e^x}{\sqrt{5-4e^x-e^{2x}}}$       95.  $\frac{1}{x^4-5x^2+16}$       96.  $\sqrt{1+2\tan x(\sec x+\tan x)}$
97.  $e^{\sqrt{x}} \frac{\cos e^{\sqrt{x}}}{\sqrt{x}}$       98.  $\cos(\log x)$       99.  $\frac{2\sin 2\theta - \cos \theta}{6 - \cos^2 \theta - 4\sin \theta}$       100.  $\tan^{-1}\left(\sqrt{\frac{1-\cos 2x}{1+\cos 2x}}\right)$

## ASSIGNMENT CLASS XII DEFINITE INTEGRALS

*Evaluate the following:*

1.  $\int_0^{\pi/2} \cos^3 x \, dx$
2.  $\int_0^{\pi/4} \sqrt{1 - \sin 2x} \, dx$
3.  $\int_0^4 \frac{1}{\sqrt{x^2 + 2x + 3}} \, dx$
4.  $\int_0^1 \frac{2x}{5x^2 + 1} \, dx$
5.  $\int_1^2 \frac{\log x}{x^2} \, dx$
6.  $\int_1^2 \frac{1}{x(1+x^2)} \, dx$
7.  $\int_{\pi/4}^{\pi/2} \cos 2x \log \sin x \, dx$
8.  $\int_1^2 \left( \frac{x-1}{x^2} \right) e^x \, dx$
9.  $\int_0^{\pi/2} \frac{\cos \theta}{(1 + \sin \theta)(2 + \sin \theta)} \, d\theta$
10.  $\int_0^{1/\sqrt{2}} \frac{\sin^{-1} x}{(1-x^2)^{3/2}} \, dx$
11.  $\int_0^{\pi/2} \cos^4 x \, dx$
12.  $\int_0^{\pi/2} (\sqrt{\tan x} + \sqrt{\cot x}) \, dx$
13.  $\int_0^{\pi} \frac{1}{5 + 4 \cos x} \, dx$
14.  $\int_0^{\pi/2} \frac{1}{2 \cos x + 4 \sin x} \, dx$
15.  $\int_0^{\pi/2} \frac{\cos x}{3 \cos x + \sin x} \, dx$
16.  $\int_0^{\pi/2} \frac{\sin 2x}{\sin^4 x + \cos^4 x} \, dx$
17.  $\int_0^1 \frac{e^x}{1+e^{2x}} \, dx$
18.  $\int_0^1 \frac{\sqrt{\tan^{-1} x}}{1+x^2} \, dx$
19.  $\int_0^{\pi/4} \sec^4 x \, dx$
20.  $\int_0^1 \sqrt{\frac{1-x}{1+x}} \, dx$
21.  $\int_1^2 \frac{1}{x(1+\log x)^2} \, dx$
22.  $\int_0^{\pi} |\cos x| \, dx$
23.  $\int_{-1}^1 e^{|x|} \, dx$
24.  $\int_{-1}^1 f(x) \, dx$ , where  $f(x) = \begin{cases} 1-2x & x \leq 0 \\ 1+2x & x \geq 0 \end{cases}$
25.  $\int_0^3 [x] \, dx$
26.  $\int_0^2 [x^2] \, dx$
27.  $\int_{-1}^1 |2x+1| \, dx$
28.  $\int_{-\pi/2}^{\pi/2} (\sin |x| + \cos |x|) \, dx$
29.  $\int_{-\pi/4}^{\pi/4} |\sin x| \, dx$
30.  $\int_1^2 \frac{\sqrt{x}}{\sqrt{3-x} + \sqrt{x}} \, dx$
31.  $\int_0^{\pi/2} \frac{\sin x}{\sin x + \cos x} \, dx$
32.  $\int_0^{\pi/2} \frac{\sin^2 x}{\sin x + \cos x} \, dx$
33.  $\int_0^{\pi/2} \frac{\sin^n x}{\sin^n x + \cos^n x} \, dx$
34.  $\int_0^{\pi/2} \sin 2x \log(\tan x) \, dx$
35.  $\int_{-\pi/4}^{\pi/4} x^3 \sin^4 x \, dx$
36.  $\int_{-a}^a \sqrt{\frac{a-x}{a+x}} \, dx$
37.  $\int_0^{\pi} \frac{x \tan x}{\sec x \cos ex} \, dx$
38.  $\int_0^1 \cot^{-1}(1-x+x^2) \, dx$
39.  $\int_{-1}^1 \log \left( \frac{2-x}{2+x} \right) \, dx$
40.  $\int_0^1 \sin^{-1} \left( \frac{2x}{1+x^2} \right) \, dx$
41.  $\int_0^1 \frac{\log(1+x)}{1+x^2} \, dx$
42.  $\int_0^1 \cos^{-1} \left( \frac{1-x^2}{1+x^2} \right) \, dx$
43.  $\int_0^{\pi/2} \frac{1}{1+\sqrt{\cot x}} \, dx$
44.  $\int_0^{\infty} \frac{x(\tan^{-1} x)^2}{(1+x^2)^{3/2}} \, dx$
45.  $\int_0^{\pi/2} x^2 \cos 2x \, dx$
46.  $\int_{-\infty}^{\infty} \frac{1}{9+x^2} \, dx$
47.  $\int_0^1 x \sqrt{\frac{1-x^2}{1+x^2}} \, dx$
48.  $\int_0^{\pi/2} \frac{1}{1+\tan^3 x} \, dx$
49.  $\int_0^1 x(1-x)^5 \, dx$
50.  $\int_0^a \frac{1}{x+\sqrt{a^2-x^2}} \, dx$
51.  $\int_0^{\infty} \frac{1}{(x^2+a^2)(x^2+b^2)} \, dx$
52.  $\int_0^{2\pi} e^x \cos \left( \frac{\pi}{4} + \frac{x}{2} \right) \, dx$