



**ARMY PUBLIC SCHOOL BIRPUR**  
**SUMMER VACATION**  
**HOLIDAY HOMEWORK**  
**SESSION: 2018-19**  
**FOR CLASS-12**

**SUBJECT-ENGLISH**

1. Look up five words every day from dictionary with meaning and frame sentences by using them in a thin notebook.
2. Write and define with example 20 Literary Devices in literature notebook.
3. Paste different types of Advertisements under each example done in language notebook.
4. Read the complete novel 'The Invisible Man'.

**SUBJECT-HINDI**

क. 'अभिव्यक्ति एवं माध्यम' पुस्तक में से 1. विभिन्न माध्यमों के लिए लेखन 2. पत्रकारीय लेखन के विभिन्न रूप और लेखन प्रक्रिया 3. विशेष लेखन स्वरूप और प्रकार 4. कैसे बनती है कविता 5. कार्यालयी पत्र 6. नाटक लिखने का व्याकरण 7. कैसे लिखें कहानी 8. कैसे बनता है रेडियो नाटक 9. नए और अप्रत्याशित विषयों पर फीचर लेखन, कहानी का नाट्य रूपांतरण 10. आलेख, पुस्तक समीक्षा पाठ पढ़ें एवं प्रत्येक में से 5 लघु प्रश्न-उत्तर तैयार करें।

ख. अभ्यास पुस्तिका में चार निबंध, चार पत्र, चार फीचर एवं चार आलेख लिख कर अभ्यास करें।

ग. एक स्वरचित कविता अथवा लेख लिखिए।

**SUBJECT-MATHS**

**NOTE: Make a test file.**

**Revise the topics given below and then attempt the set of questions based on them.**

**TOPIC- CONTINUITY AND DIFFERENTIABILITY**

1. IF the function  $f$  defined by  $f(x) = \frac{1 - \cos cx}{x \sin x}$ ,  $x \neq 0$  is continuous at  $x=0$ , find the value of  $c$ .  
 $\frac{1}{2}$ ,  $x=0$
2. Find the relationship between  $a$  and  $b$  so that the function  $f$  defined by  $f(x) = ax+1$ , if  $x \leq 3$   
 $bx+3$ , if  $x > 3$  is continuous at  $x=3$
3. For what values of  $k$  is the function  $f(x) = k(x^2-2x)$ , if  $x \leq 0$  continuous at  $x=0$ ?  
 $4x+1$ , if  $x > 0$

4. If the function  $f$  defined by  $f(x) = 3ax + b$ , if  $x > 1$

11, if  $x = 1$

$5ax - 2b$ , if  $x < 1$

is continuous at  $x = 1$ , find the values of  $a$  and  $b$ .

5. Examine the function  $f$  for continuity and derivability at  $x = 0$  where

$f(x) = 1 - x^2, x \leq 0$

$1 + x^2, x > 0$

6. Differentiate the following functions w.r.t.  $x$

(i)  $y = x^{\log x} + (\log x)x$  (ii)  $y = e \sin x + (\tan x)x$  (iii)  $y = (\log x)^{\cos x} + \frac{x^2 + 1}{x^2 - 1}$

7. If  $x = \sin t$ ,  $y = \sin pt$ , prove that  $(1 - x^2)y_2 - xy_1 + p^2y = 0$

8. If  $y = \log(x + \sqrt{x^2 + a^2})$  prove that  $(x^2 + a^2)y_2 + xy_1 = 0$

9. If  $x = a(\cos t + \log(\tan \frac{t}{2}))$  and  $y = a \sin t$ , find  $dy/dx$  at  $t = \pi/4$ .

10. If  $y = \sin(m \sin^{-1} x)$ , prove that  $(1 - x^2)y_2 - xy_1 + m^2y = 0$

11. If  $x = a \cos \theta + b \sin \theta$ ,  $y = a \sin \theta - b \cos \theta$ , prove that  $y \frac{2d^2y}{dx^2} - x \frac{dy}{dx} + y = 0$

12. If  $\cos^{-1} \frac{y}{b} = \log \left( \frac{x}{n} \right)^n$ , prove that  $x^2y_2 + xy_1 + n^2y = 0$ .

**TEST No.: 1**  
**TOPIC: MATRICES**

TIME: 2 hrs

1. If  $A = \begin{bmatrix} 4 & 3 \\ 2 & 1 \end{bmatrix}$  and  $B = \begin{bmatrix} 2 & 4 \\ 5 & 1 \end{bmatrix}$ , verify  $(AB)^{-1} = B^{-1}A^{-1}$ .

2. Solve using matrices:

(i)  $3x - 2y + z = 5$  (ii)  $x + y - z = 5$  (iii)  $2x + 3z = 15$   
 $3x + 2y - 2z = 3$   $x + 2y - 3z = 6$   $2x - y + z = 2$   
 $2x + 3y + 3z = 5$   $x - 2y + z = 4$   $3x - y - 2z = 3$

3. Split matrix  $\begin{bmatrix} 3 & 1 & 1 \\ 2 & 3 & 4 \\ 1 & 0 & 1 \end{bmatrix}$  in two matrices, one of which is symmetric and the other is skew-symmetric.

4. If  $A = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$ , verify  $A^2 - 5A + 7I = 0$ , hence find  $A^{-1}$ .

5. Find the inverse of  $A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & 4 & 1 \\ 2 & 1 & 0 \end{bmatrix}$ , using elementary row transformations.

6. If  $A' = \begin{bmatrix} -2 & 3 \\ 1 & 2 \end{bmatrix}$ ,  $B = \begin{bmatrix} -1 & 0 \\ 1 & 2 \end{bmatrix}$ , find  $(A + 2B)'$ .

7. If  $A = \begin{bmatrix} -1 & 4 \\ 3 & -7 \end{bmatrix}$ , verify that  $(A^2)' = (A')^2$ .

8. If  $A' = \begin{bmatrix} 3 & 4 \\ -1 & 2 \\ 0 & 1 \end{bmatrix}$  and  $B = \begin{bmatrix} -1 & 2 & 1 \\ 1 & 2 & 3 \end{bmatrix}$  then verify that

(i)  $(A + B)' = A' + B'$  (ii)  $(A - B)' = A' - B'$

9. For the matrix  $A = \begin{bmatrix} 1 & 5 \\ 6 & 7 \end{bmatrix}$ , verify that

(i)  $(A + A')$  is a symmetric matrix. (ii)  $(A - A')$  is a skew-symmetric matrix.

10. Using elementary column transformations, find the inverse of the following matrices:

(i)  $\begin{bmatrix} 3 & -1 \\ -4 & 2 \end{bmatrix}$

(ii)  $\begin{bmatrix} 6 & -3 \\ -2 & 1 \end{bmatrix}$

**TEST No. 2**  
**TOPIC: DETERMINANTS**

TIME: 45 min

1. Prove, using the properties of determinants (at least two)

$$(i) \begin{vmatrix} 1 & 1 & 1 \\ a & b & c \\ a^2 & b^2 & c^2 \end{vmatrix} = (a-b)(b-c)(c-a) \quad (ii) \begin{vmatrix} a & b & c + \beta \\ a & b + \beta & c \\ a + \beta & b & c \end{vmatrix} = \beta^2(a+b+c+\beta)$$

$$(iii) \begin{vmatrix} a & b & c \\ ab & bc & ca \\ a^2 & b^2 & c^2 \end{vmatrix} = abc \times ? \quad (iv) \begin{vmatrix} 1+a & 1 & 1 \\ 1 & 1+b & 1 \\ 1 & 1 & 1+c \end{vmatrix} = abc \left(1 + \frac{1}{a} + \frac{1}{b} + \frac{1}{c}\right)$$

$$(v) \begin{vmatrix} x+y & x & x \\ 6x+4y & 4x & 6x \\ 10x+8y & 8x & 3x \end{vmatrix} = x^3 \quad (vi) \begin{vmatrix} y+z & z & y \\ z & z+x & x \\ y & x & x+y \end{vmatrix} = 4xyz$$

$$(vii) \begin{vmatrix} a-b-c & 2a & 2a \\ 2b & b-c-a & 2b \\ 2c & 2c & 10a-6b+3c \end{vmatrix} = (a+b+c)^3$$

**TEST No.3**  
**TOPIC: DIFFERENTIATION**

TIME: 1 hr

1. Find  $\frac{dy}{dx}$ , if  $1+y = \sin^6 3x \cdot \cos^3 6x$

2. Find the derivative of  $\sqrt{x \sin x}$ .

3. If  $\sqrt[3]{1 + \sin 3x} = y$ , find  $\frac{dy}{dx}$ .

4. If  $y = \sin^3 \sqrt{x} + \frac{1}{4x^3}$ , find  $\frac{dy}{dx}$

5. Find the derivative of :  $e^{6x} \cos^3 x$

6. Find the derivative of the following:

$$(i) \sqrt{\frac{a^2-x^2}{a^2+x^2}} \quad (ii) \frac{\sin x + x^2}{\cot 2x} \quad (iii) \left( \frac{2 \tan x}{\tan x + \cos x} \right)$$

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

8. If  $\sin y = x \sin(a+y)$ , prove that  $\frac{dy}{dx} = \frac{\sin^2(a+y)}{\sin a}$

9. Find  $\frac{dy}{dx}$ , if  $e^x + e^y = e^{x+y}$

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

**TEST NO. 4**  
**TOPIC : IMPLICIT DIFFERENTIATION & SECOND ORDER**

Time: 1 hr

1. If  $x \cos y + x^3 = \tan^{-1} y$ , find  $\frac{dy}{dx}$

2. If  $\sin xy + \cos y = 1$  and  $\tan xy \neq 1$ , prove that  $\frac{dy}{dx} = \frac{-y}{x}$

3. Find  $\frac{dy}{dx}$ , when

(i)  $y + \sin y = \cos x$                       (iii)  $y \sec x + \tan x + x^2 y = 0$

(ii)  $\sin y + x^3 = \tan^{-1} y$               (iv)  $\sin(xy) + \frac{x}{y} = x^2 - y$

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

5. If  $y = \sqrt{1 + \sqrt{1 + x^4}}$ , prove that  $y(y^2 - 1) \frac{dy}{dx} = x^3$

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

7. If  $y = \cos^{-1} x$ , find  $\frac{d^2y}{dx^2}$  in terms of  $y$ .

8. If  $y = 3e^{2x} + 2e^{3x}$ , prove that  $\frac{d^2y}{dx^2} - 5 \frac{dy}{dx} + 6y = 0$

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

10. If  $e^y(x + 1) = 1$ , show that  $\frac{d^2y}{dx^2} = \left(\frac{dy}{dx}\right)^2$

11. Find  $\frac{d^2y}{dx^2}$  of the following:

$\sin^{-1} x$       (ii)  $\frac{2x+1}{2x+3}$       (iii)  $x^2 \log|\cos x|$

### TEST NO. 5

#### TOPIC : DIFFERENTIATION OF PARAMETRIC FUNCTIONS

Time: 1 hr

1. Find  $\frac{dy}{dx}$ , when

(i)  $x = b(\sin \theta)^2$  and  $y = a(\cos \theta)^2$

(ii)  $x = \frac{3at}{1+t^2}$  and  $y = \frac{3at^2}{1+t^2}$

(iii)  $x = e^\theta(\theta + \frac{1}{\theta})$  and  $y = e^\theta(\theta - \frac{1}{\theta})$

(iv)  $x = \cos^{-1} \frac{1}{\sqrt{1+t^2}}$  and  $y = \sin^{-1} \frac{t}{\sqrt{1+t^2}}$ ,  $t \in R$

(v)  $x = \frac{1-t^2}{1+t^2}$  and  $y = \frac{2t}{1+t^2}$

2. If  $x = \cos t$  and  $y = \sin t$ , prove that  $\frac{dy}{dx} = \frac{1}{\sqrt{3}}$  at  $t = \frac{2\pi}{3}$

3. If  $x = \frac{(\sin t)^3}{\sqrt{\cos 2t}}$ ,  $y = \frac{(\cos t)^3}{\sqrt{\cos 2t}}$ , find  $\frac{dy}{dx}$

4. If  $x = \left(t + \frac{1}{t}\right)^a$ ,  $y = a^{t+\frac{1}{t}}$ , find  $\frac{dy}{dx}$

5. Differentiate : (i)  $\log \sin x$  w.r.t  $\sqrt{\cos x}$

(ii)  $\cos^{-1} \theta$  w.r.t  $\log(1 + \theta)$

(iii)  $\sin^{-1} \frac{2x}{1+x^2}$  w.r.t  $\tan^{-1} x$

### TEST NO. 6

#### TOPIC : LOGARITHMIC DIFFERENTIATION

Time: 1 hr

Q1. Find  $\frac{dy}{dx}$  for the following functions:

a.  $x^y + y^x = c$     b.  $x^2 + y^2 + 7xy = x^2y^2$

c.  $y = x^{x^x}$     d.  $y = x^{\sin x} + (\sin x)^x$

e.  $x^y = e^{x-y}$ , prove :  $\frac{\log x}{(1+\log x)^2} = \frac{dy}{dx}$     f.  $e^{mx} + e^{-mx} + e^{my} = 1$

g. If  $(x + y) = x^m y^n$ , prove that  $\frac{dy}{dx} = \frac{y}{x}$

2. Find  $\frac{dy}{dx}$  for  $y = (2+x)(2+x^2)\dots\dots(2+x^{10})$

3. If  $y = \sqrt{4+x^3} \times \sqrt[3]{7+x^2} \times \sqrt[4]{9+x^3} \times \sqrt[5]{11+x^4}$ , find  $\frac{dy}{dx}$

4. (i) If  $y = x^x - 2^{\sin x}$ , find  $\frac{dy}{dx}$

(ii) If  $y = x^{\sin x} + (\sin x)^{\cos x}$ , find  $\frac{dy}{dx}$

### **SUBJECT -CHEMISTRY**

- 1-Prepare investigatory project for Chemistry practical examination
- 2- Do previous years questions of physical chemistry  $\frac{1}{4}$ last five year. $\frac{1}{2}$

### **SUBJECT -BIOLOGY**

1. Investigatory project: On any of the topic mentioned in the syllabus.
2. Make a Question Bank of 10 questions each from chapter 1 to 4, also write their answers.
3. Solve previous year question papers related to the chapters which have been done in separate notebook.

### **SUBJECT -PHYSICS**

1. Prepare investigatory project for physics practical examination.
2. Do back exercise of chapter 1<sup>st</sup> to 3<sup>rd</sup>.
3. Solve previous year question paper related to the chapters which have been done.

### **SUBJECT: HISTORY**

1. Prepare a model on the following topics according to the groups allotted:
  - a). Harappan Civilization
  - b). Outline structure of City Planning
  - c). MahanavamiDibba Model
  - d).Model on SanchiStupa
- 2.Watch movie on national struggle “ Gandhi” , Mohenjodaro and Mughal-e-azam
- 3.Revise and make 10 questions each from all the covered chapters in a thin note book.  
1mark= 3 questions, 3 marks=3 questions, 5 marks=4 questions(in a flow chart)
- 4.Solve assignments from [www.cbse.nic.in](http://www.cbse.nic.in)

### **SUBJECT:COMPUTER**

1. Make IP project using Swing for front end and MySQL for backend.
  - a. (Note: Only three members are allowed in one project)
2. Make any twelve GUI Programs

### **SUBJECT :PHYSICAL EDUCATION**

1. Solve all the previous year's question papers (2013-17) in fair notebook .
2. Make one chart on sports and nutrition chapter.

### **SUBJECT:ACCOUNTS**

1. **Make 2 accounts projects** as discussed in class.
2. Note:
  - a. Project should be comprehensive.
  - b. Project should be specific.

(Project to be prepared strictly according to CBSE guidelines)

Solve previous year question paper related to the chapters which have been done in class in a separate notebook. Do questions of completed chapter from ABD accounts sample paper.

Test will be taken of all chapters completed after holidays.

## SUBJECT: BUSINESS STUDIES

### 1. **Make 2 projects FROM ANY OF THE BELOW THREE TOPICS:**

- a. Elements of business environment.
- b. Principle of Henri Fayol.
- c. Principle of scientific management.

Solve previous year question paper related to the chapters which have been done in class in a separate notebook. Do case studies from mentor in case studies by alka dhawan in a separate note book of chapters have been completed.

Test will be taken of all chapters completed after holidays.

## SUBJECT: ECONOMICS

### 1. CENTRAL PROBLEM OF AN ECONOMY

- 1:- Explain the problem of how to produce?
- 2:- Explain the problem of what to produce?
- 3:- Explain the problem of for whom to produce?
- 4:- Explain the concept of marginal opportunity cost with the help of an example.
- 5:- Production in an economy is below its potential due to unemployment. Government starts employment generation scheme . Explain its effect using PPC?
- 6:- What will be the impact of recently launched Clean India mission, on the production possibility curve of the economy and why?
- 7:- What will likely be the impact of large scale inflow of foreign capital in India on the PPC and why?

### 2. CONSUMER'S EQUILIBRIUM

- 1:- Explain the condition of consumer's equilibrium with the help of utility analysis.
- 2:- Explain the condition of consumer's equilibrium with the help of Indifference curve analysis.
- 3:- Explain the concept of Marginal rate of substitution with the help of a numerical example. Also explain its behavior on Indifference curve?
- 4:- Explain the properties of Indifference curve.

### 3. THEORY OF DEMAND

- 1:- Why is there an inverse relationship between Price and Quantity demanded?
- 2:- Distinguish between contraction of demand and decrease in demand.
- 3:- Distinguish between Extension of demand and increase in demand.
- 4:- How is demand of a good affected by the rise in price of related goods? Explain.
- 5:- Explain the relationship between:
  - (a) Price of other goods and demand for the given goods.
  - (b) Income of the buyers and demand for a good.
- 6:- Explain the causes of Increase in demand.
- 7:- How does change in price of a complementary good affect the demand of the given good? Explain with the help of an example.

### 4. PRODUCTION FUNCTION

- 1:- State the behavior of Marginal product in the law of variable proportions. Explain the cause of this behavior.
- 2:- State the behavior of Total product in the law Of variable proportions. Explain the cause of this behavior.

3:-Explain the law of variable proportion with the help of total product and Marginal product curves.

4:-Explain the relationship between Total product and Marginal product.

### **5.CONCEPT OF COST**

1:-An individual is both the owner and the manager of a mall taken on lease. Identify the Explicit and Implicit cost. Also give reason

2:-A producer starts a business by investing his own savings and employs a manager to look after it. Identify Implicit and Explicit cost from this information. Also give reason.

3:-Explain the relationship between Marginal cost and Total cost.

4:-Explain the relationship between Average cost and Marginal cost.

HAVE A WONDERFUL VACATION....