

**HOLIDAY HOMEWORK 2018-19**
**Class: XII A**

This year, your holiday homework is a fun mix of all the aspects of learning. It has been designed to ensure that you enjoy and learn at the same time. Special attention has been taken to ensure that you use your creativity, your innovative ideas and your imagination to shape your holiday homework into fantastic 'creations'. So enjoy your holidays spending quality times with your near and dear ones and devote sometimes to learn new things.

**General Instructions:**

- Holiday Homework of all subjects to be done in **separate Stick Files** (only).
- The areas to be covered are suggested below. You can of course use your creativity and innovation for new ideas too!
- Credit will be awarded to original photographs/ drawings, illustrations and creative use of materials.
- Holiday Homework needs to be submitted on 10<sup>th</sup> July 2018.
- Holiday Homework needs to be developed and presented in this order:
  - Cover page showing title, student information, school and academic year and parent's signature.
  - List of contents with page numbers.
  - The last page should have Bibliography/ Sources of information from where you have collected your information.

**Subject: English**

Read the novel, The Invisible man and write a 300- 400 word book review covering the following aspects: Plot and theme, main characters, setting, language and vocabulary and any other elements which make the story interesting.

**Subject: Mathematics**
**TOPIC: Matrices**

1. Verify that  $(AB)^T = B^T A^T$ , where: (i)  $A = \begin{pmatrix} 2 & 3 \\ 4 & 1 \end{pmatrix}$ ,  $B = \begin{pmatrix} 1 & 0 & -1 \\ 2 & 1 & 3 \end{pmatrix}$  (ii)  $A = \begin{pmatrix} 3 \\ 5 \\ 2 \end{pmatrix}$ ,  $B = (1 \ 0 \ 4)$
2. If  $A = \begin{pmatrix} 3 & 1 \\ -1 & 2 \end{pmatrix}$ , show that  $A^2 - 5A + 7I = 0$ . Hence find  $A^{-1}$ .
3. Express  $\begin{pmatrix} 4 & 3 & 7 \\ 6 & 5 & -8 \\ 1 & 2 & 6 \end{pmatrix}$  as a sum of a symmetric matrix and a skew-symmetric matrix.
4. Let  $A = \begin{pmatrix} \cos \alpha & \sin \alpha \\ -\sin \alpha & \cos \alpha \end{pmatrix}$ , prove by mathematical induction that  $A^n = \begin{pmatrix} \cos n\alpha & \sin n\alpha \\ -\sin n\alpha & \cos n\alpha \end{pmatrix}$  for every positive integer n.
5. If  $A = \begin{pmatrix} 3 & 2 \\ 1 & 1 \end{pmatrix}$ , verify that  $A^2 - 4A + I = 0$  hence find  $A^{-1}$

6. If  $A = \begin{pmatrix} 3 & -2 \\ 4 & -2 \end{pmatrix}$  find k such that  $A^2 = K A - 2I_2$

7. If the matrix  $\begin{pmatrix} -2 & x-y & 5 \\ 10 & 0 & 4 \\ x+y & z & 7 \end{pmatrix}$  is symmetric, find the values of x,y and z.

8. Find the inverse of the matrix by using elementary operation:  $\begin{pmatrix} 1 & 3 & -2 \\ -3 & 0 & -1 \\ 2 & 1 & 0 \end{pmatrix}$

9. If  $A^{-1} = \begin{pmatrix} 3 & -1 & 1 \\ -15 & 6 & -5 \\ 5 & -2 & 2 \end{pmatrix}$  and  $B = \begin{pmatrix} 3 & 2 & -2 \\ -1 & 3 & 0 \\ 0 & -2 & 1 \end{pmatrix}$ , find  $(AB)^{-1}$

10. Find the matrix X such that  $\begin{pmatrix} 2 & -1 \\ 0 & 1 \\ -2 & 4 \end{pmatrix} X = \begin{pmatrix} -1 & -8 & -10 \\ 3 & 4 & 0 \\ 10 & 20 & 10 \end{pmatrix}$

11. If  $A = \begin{pmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{pmatrix}$ , prove that  $A^2 - 4A - 5I = 0$  hence find  $A^{-1}$

12. If  $\begin{pmatrix} 0 & -\tan \frac{\alpha}{2} \\ \tan \frac{\alpha}{2} & 0 \end{pmatrix}$  and I is the identity matrix of order 2, show that

$$I + A = (I - A)^{-1} = \begin{pmatrix} \cos \alpha & -\sin \alpha \\ \sin \alpha & \cos \alpha \end{pmatrix}$$

13. Two schools A and B want to award their selected students on the values of sincerity, truthfulness and helpfulness. The school A wants to award ₹ x each, ₹ y each and ₹ z each for the three respective values to 3, 2 and 1 students respectively with total award money of ₹ 1,600. School B wants to spend ₹ 2,300 to award its 4, 1 and 3 students on the respective values (by giving the same award money to the three values as before). If the total amount of award for one prize on each value is ₹ 900, using matrices, find the award money for each value. Apart from these three values, suggest one more value which should be considered for award.

**TOPIC: Determinants**

1. If  $A = \begin{pmatrix} 1 & 1 & 1 \\ 1 & 2 & -3 \\ 2 & -1 & 3 \end{pmatrix}$ , find  $A^{-1}$  and use it solve the system of equations:

$$x + y + 2z = 9, x + 2y - z = 9, x - 3y + 3z = -14.$$

2. Using matrices, solve the following system of equations:  $3x - y + z = 5, 2x - 2y + 3z = 7, x + y - z = -1.$

**Prove the following by using the properties of determinants:**

$$3. \begin{vmatrix} a & a+b & a+2b \\ a+2b & a & a+b \\ a+b & a+2b & a \end{vmatrix} = 9b^2(a+b)$$

$$4. \begin{vmatrix} b+c & c+a & a+b \\ q+r & r+p & p+q \\ y+z & z+x & x+y \end{vmatrix} = 2 \begin{vmatrix} a & b & c \\ p & q & r \\ x & y & z \end{vmatrix}$$

$$5. \begin{vmatrix} 3a & -a+b & -a+c \\ a-b & 3b & c-b \\ a-c & b-c & 3c \end{vmatrix} = 3(a+b+c)(ab+bc+ca)$$

$$6. \begin{vmatrix} (b+c)^2 & a^2 & bc \\ (c+a)^2 & b^2 & ca \\ (a+b)^2 & c^2 & ab \end{vmatrix} = (a-b)(b-c)(c-a)(a+b+c)(a^2+b^2+c^2)$$

$$7. \begin{vmatrix} (b+c)^2 & a^2 & a^2 \\ b^2 & (c+a)^2 & b^2 \\ c^2 & c^2 & (a+b)^2 \end{vmatrix} = 2abc(a+b+c)^3$$

$$8. \begin{vmatrix} (b+c)^2 & ab & ac \\ ab & (c+a)^2 & bc \\ ac & bc & (a+b)^2 \end{vmatrix} = 2abc(a+b+c)^3$$

$$9. \begin{vmatrix} a+x & y & z \\ x & a+y & z \\ x & y & a+z \end{vmatrix} = a^2(a+x+y+z)$$

$$10. \text{ Using properties of determinants, Solve for } x: \begin{vmatrix} a+x & a-x & a-x \\ a-x & a+x & a-x \\ a-x & a-x & a+x \end{vmatrix} = 0$$

11. Using properties of determinants, show that  $\Delta ABC$  is isosceles if

$$\begin{vmatrix} 1 & 1 & 1 \\ 1+\cos A & 1+\cos B & 1+\cos C \\ \cos^2 A + \cos A & \cos^2 B + \cos B & \cos^2 C + \cos C \end{vmatrix} = 0$$

12. If  $x, y, z$  are real numbers such that  $x + y + z = \pi$  then find the value of

$$\begin{vmatrix} \sin(x+y+z) & \sin(x+z) & \cos z \\ -\sin y & 0 & \tan x \\ \cos(x+y) & \tan(y+z) & 0 \end{vmatrix}$$

**TOPIC: Linear Programming**

1. A dealer deals in two items only – item A and item B. He has ₹ 50,000 to invest and a space to store at most 60 items. An item A costs ₹ 2,500 and an item B costs ₹ 500. A net profit to him on item A is ₹ 500 and on item B ₹ 150. If he can sell all the items that he purchases, how should he invest his amount to have maximum profit? Formulate an LPP and solve it graphically.
2. A manufacturing company makes two models A and B of a product. Each piece of model A requires 9 hours of labour for fabricating and 1 hour for finishing. Each piece of model B requires 12 hours of labour for fabricating and 3 hours for finishing. The maximum number of labour hours, available for fabricating and for finishing, are 180 and 30 respectively. The company makes a profit of Rs 8000 and Rs 12000 on each piece of model A and model B respectively. How many pieces of each model should be manufactured to get maximum profit? Also, find the maximum profit.
3. Solve the following Linear Programming Problem graphically:  
Maximize  $Z = 3x + 4y$  subject to  $x + y \leq 4, x \geq 0, y \geq 0$
4. A firm has to transport at least 1200 packages daily using large vans which carry 200 packages each and small vans which can take 80 packages each. The cost for engaging each large van is ₹ 400 and each small van is ₹ 200. Not more than ₹ 3,000 is to be spent daily on the job and the number of large vans cannot exceed the number of small vans. Formulate this problem as a LPP given that the objective is to minimize cost.
5. Solve the following Linear Programming problem graphically: Minimize:  $z = 6x + 3y$ , Subject to the constraints:  $4x + y \geq 80, x + 5y \geq 115, 3x + 2y \leq 150$
6. A housewife wishes to mix together two kinds of food, X and Y, in such a way that the mixture contains at least 10 units of vitamin A, 12 units of vitamin B and 8 units of vitamin C. The vitamin contents of one kg of food is given below :

	Vitamin A	Vitamin B	Vitamin C
Food X	1	2	3
Food Y	2	2	1

- One kg of food X costs ₹ 6 and one kg of food Y costs ₹ 10. Formulate the above problem as a linear programming problem and find the least cost of the mixture which will produce the diet graphically. What value will you like to attach with this problem?
7. Solve the following linear programming problem graphically :  
Minimize :  $z = 3x + 9y$   
When :  $x + 3y \leq 60$   
 $x + y \geq 10$   
 $x \leq y$   
 $x \geq 0, y \geq 0$
  8. Two godowns A and B have grain capacity of 100 quintals and 50 quintals respectively. They supply to 3 ration shops, D, E and F whose requirements are 60, 50 and 40 quintals respectively. The cost of transportation per quintal from the godowns to the shops are given in the following table:

Transportation cost per quintal (in Rs)		
From/To	A	B
D	6	4
E	3	2
F	2.50	3

How should the supplies be transported in order that the transportation cost is minimum?  
What is the minimum cost?

9. An oil company has two depots A and B with capacities of 7000 L and 4000 L respectively. The company is to supply oil to three petrol pumps, D, E and F whose requirements are 4500L, 3000L and 3500L respectively. The distance (in km) between the depots and the petrol pumps is given in the following table:

Distance in (km)		
From/To	A	B
D	7	3
E	6	4
F	3	2

Assuming that the transportation cost of 10 liters of oil is Rs. 1 per km, how should the delivery be scheduled in order that the transportation cost is minimum? What is the minimum cost?

10. Minimise and Maximise  $Z = 5x + 10y$   
Subject to  $x + 2y \leq 120$ ,  $x + y \geq 60$ ,  $x - 2y \geq 0$ ,  $x, y \geq 0$ .

### Subject: Accountancy

Students will work on at least **three types of projects** out of which one will be of Comprehensive nature.

The comprehensive project will involve the students from the initial stage of accounting to the preparation and analysis of financial statements. The data provided or the Project Statement will be as close to the real life situations as possible. The project statement should cover all important aspects like investments, financing, operating, adjustments to final accounts, etc. in a condensed form. The situations given in these problems will require a student to derive meaningful conclusion for taking decisions for the purposes of investment, expansion, financing, etc.

Two projects will be of specific nature using at least one tool of analysis in each. The data for these will be drawn mainly from quarterly or half yearly or annual reports of corporate sector. Students will analyze the information given in the financial statements as follows :

- a) Performance of Segments keeping in mind their three parameters Revenue, Net Profit and Capital Employed of companies on quarterly or half yearly or annual basis. This is widely published and reported by the companies. It can be picked up either from the newspapers or from the websites of the companies.
- b) Comparison of Revenue, Net Profit and Earning Per Share (EPS) on quarterly or half yearly or annual basis with the help of comparative or common size statements. The Projects given in these guidelines are on sample areas of business activities like Segment Reporting, etc. The teachers and students are free to explore more such areas of business activities for specific projects.

There are four tools of analysis given in the syllabus for the analysis of Financial Statements, namely

- (i) Comparative Statement,
- (ii) Common Size Statements,

- (iii) Ratios and
- (iv) Cash Flow Statement.

Any one or more of these tools are to be used to derive conclusions. No project is to be prepared on the tools, but these tools are to be used to achieve the object of the project. For instance, there will not be any project on the 'Ratios' as such, but ratios will be used in the development of the project to reach a conclusion.

For the purpose of Project Work, the following ratios need to be included :

Liquidity Ratios: Current Ratio, Liquidity Ratio.

Solvency Ratios: Debt to Equity; Total Assets to Debt, Proprietary Ratio.

Activity Ratios : Inventory Turnover, Debtors Turnover, Payables Turnover, Working Capital Turnover, Fixed Assets Turnover, Current Assets Turnover.

Profitability Ratio : Gross Profit Ratio, Operating Ratio, Net Profit Ratio, Return on Investment, Earning Per Share – Price Earnings Ratio.

### **PROJECT FILE**

Students will prepare a Project File to record their work related to the problems attempted by them in the following format :

1. First page of the file should describe title of work, identity of student, school, and the teacher concerned.
2. Index to indicate columns for title of work, page no., date, teacher's remarks and signature.
3. The format for Project Work will be :

- Statement of the problem/Name of the Project
- Objectives
- Period of Study
- Source Material
- Tools of Analysis used
- Processing and Tabulation of data
- Diagrammatic/graphic presentation- pie-diagrams, bar diagrams and graphs.
- Derivations, Interpretation and Conclusion.
- Assumptions (if any)

Project File should be neatly handwritten and presentable with page numbers. Each step of the solution needs to be highlighted. Conclusions drawn should be placed in boxes at the end.

### **Subject: Business Studies**

You are required to do a project on development and marketing of a product.

#### **General guidelines:**

- Get a product idea
- Development of the idea
- Reason for selecting the product
- Designing of packet, label, tag line and logo
- Identification of competitors and their price
- Strategies used for pricing decision
- SWOT Analysis
- Levels of packaging
- Channel of distribution
- Conclusion
- Bibliography

## Subject: Economics

**You need to follow the guidelines listed below to complete this project:**

- a) Explanation of the concept:
- b) Meaning and Definition
- c) Application of the concept
- d) Diagrammatic Explanation (if any)
- e) Numerical Explanation related to the concept etc. (if any)
- f) Students' own views/perception/ opinion and learning from the topic.

**Suggested List of topics [ANY ONE TOPIC]**

- Price Determination- Harsh Garg
- Human Development Index- Harshil
- Production Possibility Curve- Arnav
- Demand and its determinants- Rohan Dhawan
- Production –Returns to a Factor- Yash
- Inflation in India- Pawan Jaiswal
- Monopoly- Puneet
- Oligopoly- Ashish
- Monopolistic Competition- Himanshu
- Perfect competition- Shubham
- Central Bank and its functions- Aastha
- Government Budget & its Components- Nitin
- GST - Chetan
- Foreign Exchange Markets- Harsh Agarwal
- Self-help Group- Girish
- Balance of payments – Anurag

**N.B:** Make your report investigatory; do the research work on the policies and the steps that are implemented in the recent years; collect data on the budgetary policies taken up by the government; give examples of local markets, if any; give examples of the changes within your society; take in as many practical examples that you can to make your project/ report varied but be practical.

### **GENERAL GUIDELINES:**

1. The total length of the project will be of 25 to 30 pages.
2. The project should be handwritten.
3. The project should be presented in a neat folder.
4. The project report should be developed in the following sequence-
  - (a) Cover page should include the title of the Project, student information, school and year.
  - (b) List of contents.
  - (c) Acknowledgements and preface (acknowledging the institution, the places visited and the persons who have helped.
  - (d) Introduction.
  - (e) Topic with suitable heading.
  - (f) Planning and activities done during the project, if any.
  - (g) Observations and findings of the visit.
  - (h) Conclusions (summarized suggestions or findings, future scope of study).
  - (i) Photographs (if any).
  - (j) Bibliography

## Subject: Entrepreneurship

### **Project I Market Survey**

Students will have to conduct the survey in any one of the below mentioned topics and follow the guidelines:

- A. Conduct a simple market research with the objective of estimating demand for an existing product in the market. Students will have to give an innovative suggestion to the product.
- B. Conduct a survey for a new innovative product.
- C. Conduct a survey for study on
- Smoking habits
  - Skill Trading Option in an economic backward neighborhood
  - Wearing Helmets
  - Attitudes of Road Users
  - Conservation of Electricity
  - Rainwater Harvesting

## Project–II Business Plan

### Page wise guideline for Entrepreneurship

#### Page 1 Cover Page

Design and attractive cover page and write following things:

Business Plan	
Under the guidance of:	Submitted by:
(Name of teacher)	(Name of student)
Roll no:	
Logo of school	
Name and Address of the school	

**Page 2 Certificate of Authenticity** - Print the certificate

#### Page 3 – Acknowledgement

I, \_\_\_\_\_, do hereby declare that this project is my original work and I would like to thank Ms \_\_\_\_\_, my Entrepreneurship teacher, for her wholehearted support and guidance for making it possible to complete this project on time. I would also like to thank CBSE for giving us an opportunity to widen our knowledge base by introducing this topic of study and my school for giving us this subject option.

I would also like to thank my friends and family members for their kind support and guidance without which this project could not have been completed.

#### Page 4 Objectives

1 page and Give 3 to 4 objectives in points

Examples of Objectives:

- To understand the Hair oil industry
- To find out the possibility of marketing a new brand of hair oil
- To understand my competitor and their products
- To identify the details about my target market
- To estimate my start-up cost, risk associated and selling price.
- To prepare my projected statement of profit and loss
- To conduct a break-even analysis

#### Page 5 Index

S.NO	PARTICULARS	PAGE NO
1.	Name Of The Business, Logo And Tagline	



2. Competing Product/Services
3. Marketing Plan
4. Cost Decisions
5. Selling Price
6. Start-up Costs
7. Risk Analysis
8. Statement of Profit And Loss
9. Break Even Analysis
10. Bibliography
11. Appendix
12. Teacher's Observations
13. Signature of Teachers

**Page 6 Name of the Business, Logo and Tagline**

1. Name of your business and reasons for choosing it.
2. Define a 'Logo' giving the benefits of having a logo and draw a logo for your business.
3. Define a 'tagline' giving the benefits of having a tagline and draft a tagline for your business.

**Page 7 Competing Product/Services and our USP**

1. Are there similar products and services in the market? Give details of at least 3 such competitors.
2. Also, give what you consider to be your competitive advantage and your USP (Unique Selling Proposition) that will beat the competition.

**Page 8 Marketing Plan**

a. Market Research Plan.

- Talk about your competitor, demand for your product and service - is it there or do you think that you can create it?
- Talk about at least 3 competitors if it is an existing product (compare it with your product). If it is a new product, then analyse the demand for the product.

b. Target customers and how will you reach them.

- What do you mean by Target Market
- Define who constitutes a firm's target Market.
- Dive details about your target market with reasons for your choice. Example children, teenagers, housewives, working women etc. (You can also select target market on basis of income level, gender, marital status, education level, occupation, Age etc.)

c. Your advertising and promotion idea.

- Define Promotion Mix and its components.
- Mention the tools of promotion mix that you would be using. (include Advertising , Public relations , Sales Promotion and Personal selling and also give reasons for your choice )

d. Packaging (if applicable) Eco friendly packaging

e. Distribution (how do you intend to reach your consumers)

- Define Channels of distribution – Direct and Indirect
- Explain the reasons for your choice of Channels of Distribution

f. What does quality mean for your product/service?

- Including applicable standardization marks such as Agmark, FPO, ISI etc.

**Page 9 Costing decisions**

What is the cost of a unit of your product or unit service?

- Define 'Costs' and its components: i. Fixed costs ii. Variable costs
- Show the computation or explain the logic here.
- Compute the Fixed Costs. i. Consultation Charges ii. Salary iii. Rent iv. Insurance
- Compute the Variable Costs - Any of the following details can be added: i. Packing Charges, ii. Raw Material iii. Power IV. Wages

**Page 10 Selling Price**

- What is your selling price and the reason for it?
- Name the pricing strategy adopted by you

**Page 11 Start-up Costs**

- Give details of your Start Up costs here:
- Land ii. Building iii. Computers iv. Equipment's v. Machinery vi. Vehicles vii. Vessels viii. Software ix. Hardware x. Inauguration ceremony expenses xi. Raw materials xii. Salary xiii. Rent in advance etc.
- How would you meet your start-up costs?( How much will be owner's fund and how much will be borrowed and at which rate of interest)

**Page 12 Risk Analysis**

- Define Business Risk
- Explain the causes of Business risk
- What are the likely risk factors of your business and how would you meet them?

**Page 13 Statement of Profit and Loss**

1. Let us say that it's now a year since you started your Business. Give us one month's Profit and Loss Statement for the first month of the second year to cover the following main items: (All figures to be for one whole month)

S.no	Particulars	Units	Rupees	Rupees
a	Sales			XXXX
b	Cost Of Sales			XXXX
c	Gross Profit = a - b			XXXX
	Fixed Expenses:			
	Salaries		XXXX	
	Rent		XXXX	
	Utilities		XXXX	
	Monthly Interest Only On The Loan taken		XXXX	
	Transport		XXXX	
	Miscellaneous		XXXX	
d	Total Fixed Expenses ( Cash)			XXXX
e	Depreciation (Non-Cash)			XXXX
f	Total Fixed Expenses (Cash And Non-Cash) = d+e			XXXX
g	Operating Profit Or Loss = c-f			XXXX
h	Taxes = Use 25% On Profits Only			XXXX
i	Profit Or Net Loss = g-h			XXXX

**Page 14 Break Even Analysis**

Define Break-even point

What is the Break-even point of your business? Show the computation assuming the selling price and the units that will be sold.

**Page 15 Conclusion & Recommendations**

The complete findings of the project to be presented here in points in one or two pages.

**Page 16 Bibliography**

Names of books used and website addresses.

**Page 17 Appendix**

- Any specific terms used are to be defined here
- Questionnaire to be attached here.

**Page 18 Business Plan Evaluation Performa – Take Printout**

### **Subject: Informatics Practices**

1. Design an E-Business application that offers an interface to search and view Mobile details from SMARTMOBILE table in the database. If the user decides to buy them its details get added to the Order Table and internally the SMARTMOBILE recorded is updated (minus qty ordered) in the table. When user clicks at **Submit** button, then a message box informs the user about number of toys ordered and total bill amount; upon clicking **Exit** button, the application is closed.

**Specification :**

- In search criterion, if name is selected then the label with text “Enter lower limit” changes to “Enter Name” and the Label with text “Enter upper limit” and the text field become disabled. Otherwise (in case Price or Age is selected as Sort Criterion) then lower limit and upper limit text fields apply to the selected criterion.
- After obtaining the search Criterion, search should be performed in the SMARTMOBILE table and the mobile List box should get filled accordingly.
- The Order Qty text field is enabled only when the CLICK ME check box is ticked.
- The Mobile details get added to MOBILE ORDERED table only after Confirm Order Button is pressed for the Mobile.

**Text Book Reference:** Page No. : 540, Lab Q. 16

2. Create a HTML data entry web form to illustrate TextBox, Label, CheckBox, Option Button, ListBox and command button. Students may use other HTML controls.

**Text Book Reference:** Page No. : 345, Lab Q. 3

**Note:** Student may carry educational/software CD which is attached with the text book. They may install NetBeans IDE from the CD or they can download from the internet.