

HALF YEARLY EXAMINATION - 2017

SUBJECT - MATHEMATICS (041)

TIME - 3 HOURS

CLASS - X

MAX. MARKS - 80

General Instructions :

1. All questions are compulsory.
2. The question paper consists of 30 questions divided into four sections A, B, C and D. Section-A comprises of 6 questions of 1 mark each; Section-B comprises of 6 questions of 2 marks each; Section-C comprises of 10 questions of 3 marks each and Section-D comprises of 8 questions of 4 marks each.
3. There is no overall choice in this question paper.
4. Use of calculator is not permitted.

SECTION - A

1. For any integer  $a$  and  $3$ , there exist unique integers  $q$  and  $r$  such that  $a = 3q + r$ . Find the possible values of  $r$ .
2. For which values of  $p$ , does the following pair of equations has a unique solution:  $4x + py + 8 = 0$  and  $2x + 2y + 2 = 0$ ?
3. A circle has its centre at the origin and a point  $P(5, 0)$  lies on it. The point  $Q(6, 8)$  lies outside the circle. State true or false. Justify your answer.
4. If  $\alpha$  and  $\beta$  are the zeroes of a polynomial, such that  $\alpha + \beta = 6$  and  $\alpha\beta = 4$ , then write the polynomial.
5. If  $\Delta ABC \sim \Delta RPQ$ ,  $AB = 3\text{cm}$ ,  $BC = 5\text{cm}$ ,  $AC = 6\text{cm}$ ,  $RP = 6\text{cm}$  and  $PQ = 10\text{cm}$ , then find  $QR$ .
6. Find mode, using the empirical relation, when it is given that the mean and median are 10.5 and 9.6 respectively.

SECTION - B

7. 'The product of three consecutive positive integers is divisible by 6.' Is this statement true or false? Justify your answer.
8. 'A' is a point on the y-axis whose ordinate is 5 and B is the point  $(-3, 1)$ . Calculate the length of AB.
9. Find the HCF of 65 and 117 and find a pair of integral values of  $m$  and  $n$  such that  $\text{HCF} = 65m + 117n$ .

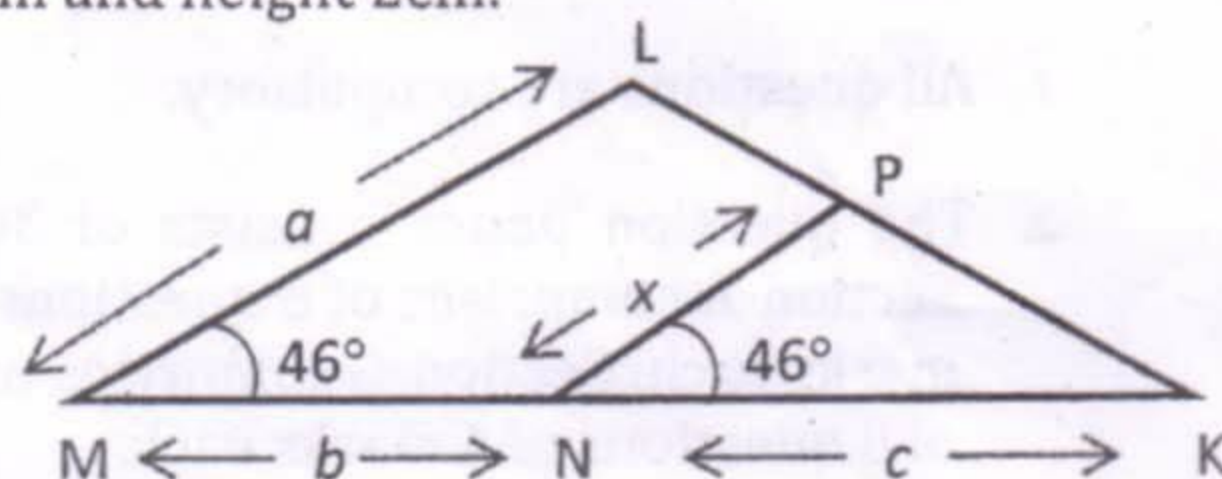


10. Determine the missing frequency  $x$ , from the following data, when mode is 67.

Class	40 - 50	50 - 60	60 - 70	70 - 80	80 - 90
Frequency	5	$x$	15	12	7

11. Find the volume of a frustum of base radii 7cm and 3.5cm and height 2cm.

12. In fig.  $\angle M = \angle N = 46^\circ$ . Express  $x$  in terms of  $a$ ,  $b$  and  $c$ , where  $a$ ,  $b$  and  $c$  are lengths of LM, MN and NK respectively.

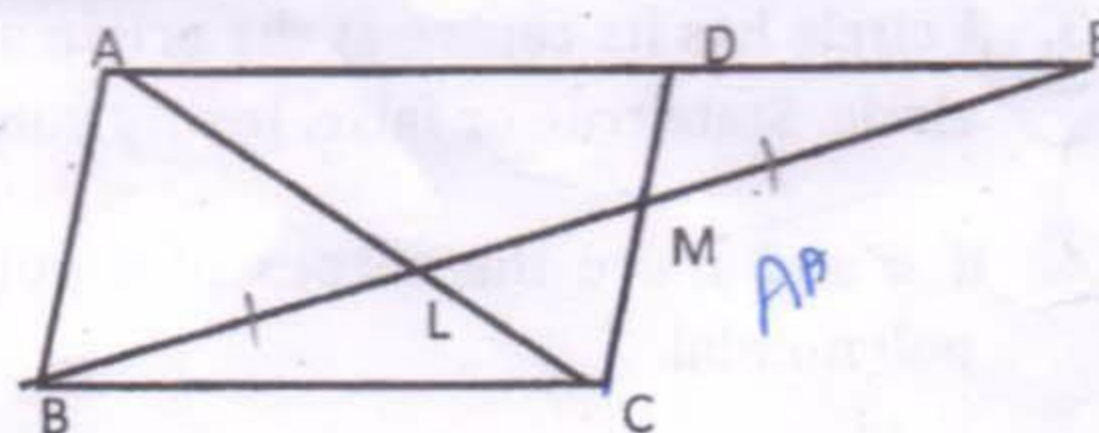


### SECTION - C

13. Prove that the sum of squares of the sides of a rhombus is equal to the sum of squares of its diagonals.
14. Prove that  $\sqrt{3}$  is irrational.
15. If one zero of the polynomial  $(k+1)x^2 - 5x + 5$  is the multiplicative inverse of the other, then find the value of  $k$  and the zeroes of the polynomial  $kx^2 - 3kx + 9$ .

16. Solve for  $x$  and  $y$ :  $\frac{2}{3x+2y} + \frac{3}{3x-2y} = \frac{17}{5}$  ;  $\frac{5}{3x+2y} + \frac{1}{3x-2y} = 2$

17. In the figure, M is the mid-point of side CD of parallelogram ABCD. The line BM is drawn intersecting AC at L and AD produced at E. Prove that  $EL = 2BL$ .



18. Show that the points  $P(0, -2)$ ,  $Q(3, 1)$ ,  $R(0, 4)$  and  $S(-3, 1)$  are the vertices of a square.
19. When a polynomial  $6x^4 + 8x^3 + 29x^2 + 21x + 7$  is divided by another polynomial  $3x^2 + 4x + 1$ , the remainder is in the form  $ax + b$ . Find  $a$  and  $b$ .
20. A solid wooden toy is in the form of a hemisphere surmounted by a cone of same radius. The radius of hemisphere is 3.5cm and total wood used in making the toy is  $166\frac{5}{6}$  cm<sup>3</sup>. Find the height of the toy. Also, find the cost of painting the hemispherical part of the toy at the rate of ₹10 per cm<sup>2</sup>. [Use  $\pi = \frac{22}{7}$ ]
21.  $\Delta ABC$  is right angled at C. If  $p$  is the length of the perpendicular from C to AB and  $a$ ,  $b$ ,  $c$  are the lengths of the sides opposite  $\angle A$ ,  $\angle B$ ,  $\angle C$  respectively then prove that  $\frac{1}{p^2} = \frac{1}{a^2} + \frac{1}{b^2}$ .



22. In a hospital during the month of October 2013, number of patients admitted for dengue and their ages are as follows :

Age (in years)	0 - 8	8 - 16	16 - 24	24 - 32	32 - 40	40 - 48	48 - 56	56 - 64	64 - 72
No. of patients	10	12	8	25	15	11	21	30	22

Find the mean age of patients by step deviation method.

#### SECTION - D

23. A solid is in the form of a cylinder with hemispherical ends. The total height of the solid is 19cm and diameter of the cylinder is 7 cm. find the volume and surface area of the solid.
24. Obtain all zeroes of the polynomial  $x^4 - 3\sqrt{2}x^3 + 3x^2 + 3\sqrt{2}x - 4$ , if two of its zeroes are  $\sqrt{2}$  and  $2\sqrt{2}$ .
25. Solve the following equations graphically :  $2x + y = 2$  ;  $2y - x = 4$ . What is the area of the triangle formed by these lines and the line  $y = 0$  ?
26. Find the values of  $k$  so that the area of the triangle with vertices  $(1, -1)$ ,  $(-4, 2k)$ , and  $(-k, -5)$  is 24 sq. units.
27. In a right angled triangle, the square of hypotenuse is equal to the sum of squares of the other two sides. Prove it.
28. Ved travels 600 km to his home partly by train and partly by car. He takes 8 hours if he travels 120 km by train and the rest by car. He takes 20 min longer if he travels 200km by train and the rest by car. Find the speed of the train and the car.
29. Draw a 'less than type' ogive for the following frequency distribution :

Class	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45
Frequency	13	18	31	25	15	5

Also find the median from the graph.

30. An NGO decided to donate money for books and pencils to the students of a school run by some other NGO. For this they collected some amount from different people. The total amount collected is represented by  $4x^4 + 2x^3 - 8x^2 + 3x - 7$ . From this fund each student received an equal amount. The number of students, who received the amount from NGO is represented by  $x - 2 + 2x^2$ . After distribution, amount equal to  $5x - 11$  is left with the NGO which they donated to school for their infrastructure. Find the amount received by each student. What value has been depicted here?





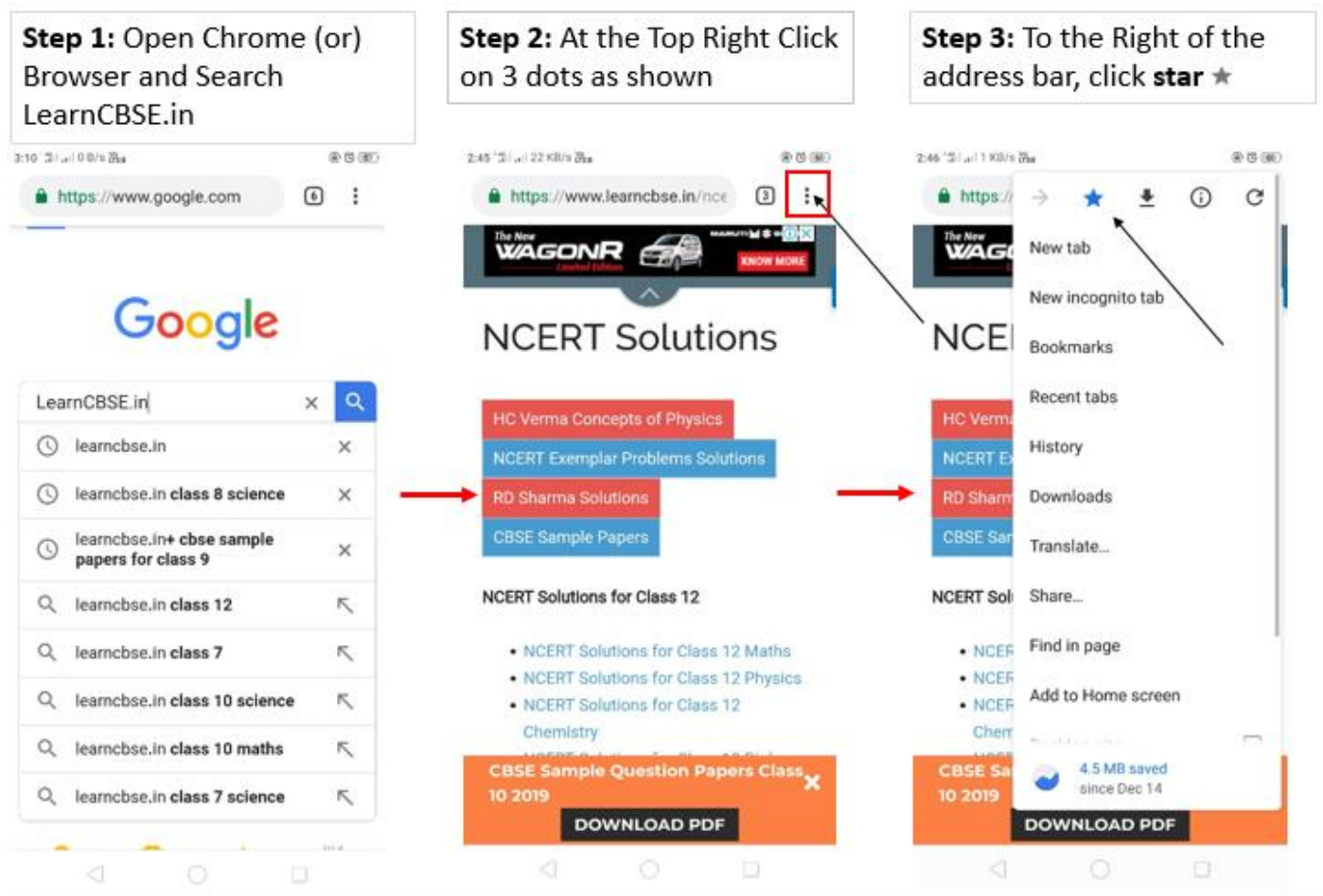
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UNIT No	Name of the Unit	Scoring Marks
1	Number Systems	6
2	Algebra	20
3	Coordinate Geometry	6
4	Geometry	15
5	Trigonometry	12
6	Mensuration	10
7	Statistics and Probability	11
	Total	80

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You will find solutions for Lakhmir Singh and Manjit Kaur class 10 Physics:

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- [Lakhmir Singh Physics Class 10 Chapter 2 Magnetic Effects of Electric Current](#)
- [Lakhmir Singh Physics Class 10 Chapter 3 Sources of Energy](#)
- [Lakhmir Singh Physics Class 10 Chapter 4 Reflection of Light](#)
- [Lakhmir Singh Physics Class 10 Chapter 5 Refraction of Light](#)
- [Lakhmir Singh Physics Class 10 Chapter 6 The Human Eyes And The Colorful World](#)

## Lakhmir Singh Chemistry Class 10 Solutions

- [Chapter 1 – Chemical Reactions and Equations](#)
- [Chapter 2 – Acids, Bases and Salts](#)
- [Chapter 3 – Metals and Non-metals](#)
- [Chapter 4 – Carbon And Its Compounds](#)
- [Chapter 5 – Periodic Classification Of Elements](#)

## Lakhmir Singh Biology Class 10 Solutions

- [Chapter 1 – Life Processes](#)
- [Chapter 2 – Control and Coordination](#)
- [Chapter 3 – How do Organisms Reproduce?](#)
- [Chapter 4 – Heredity and Evolution](#)
- [Chapter 5 – Our Environment](#)
- [Chapter 6 – Management Of Natural Resources](#)

## Important Questions for Class 10 Science – List of Chapters

- [Chapter 1 Chemical Reactions and Equations](#)
- [Chapter 2 Acids Bases and Salts](#)
- [Chapter 3 Metals and Non-metals](#)

- [Chapter 4 Carbon and its Compounds](#)
- [Chapter 5 Periodic Classification of Elements](#)
- [Chapter 6 Life Processes](#)
- [Chapter 7 Control and Coordination](#)
- [Chapter 8 How do Organisms Reproduce](#)
- [Chapter 9 Heredity and Evolution](#)
- [Chapter 10 Light Reflection and Refraction](#)
- [Chapter 11 Human Eye and Colourful World](#)
- [Chapter 12 Electricity](#)
- [Chapter 13 Magnetic Effects of Electric Current](#)
- [Chapter 14 Sources of Energy](#)
- [Chapter 15 Our Environment](#)
- [Chapter 16 Management of Natural Resources](#)

## NCERT Exemplar Problems Solutions for Class 10 Science

- [Chapter 1 Chemical Reactions and Equations](#)
- [Chapter 2 Acids Bases and Salts](#)
- [Chapter 3 Metals and Non-metals](#)
- [Chapter 4 Carbon and its Compounds](#)
- [Chapter 5 Periodic Classification of Elements](#)
- [Chapter 6 Life Processes](#)
- [Chapter 7 Control and Coordination](#)
- [Chapter 8 How do Organisms Reproduce](#)
- [Chapter 9 Heredity and Evolution](#)
- [Chapter 10 Light Reflection and Refraction](#)
- [Chapter 11 Human Eye and Colourful World](#)
- [Chapter 12 Electricity](#)
- [Chapter 13 Magnetic Effects of Electric Current](#)
- [Chapter 14 Sources of Energy](#)
- [Chapter 15 Our Environment](#)
- [Chapter 16 Management of Natural Resources](#)

## CBSE Notes for Class 10 Science

- [Carbon and its Compounds](#)
- [Periodic Classification of Elements](#)
- [How do Organisms Reproduce](#)
- [Heredity and Evolution](#)
- [Light Reflection and Refraction](#)
- [Human Eye and Colorful World](#)
- [Our Environment](#)
- [Management of Natural Resources](#)

All These Questions have been solved keeping in mind the guidelines issued by the CBSE. This has also been done in accordance with the marking scheme usually followed by the Board.

It is an established fact that the impact of NCERT Textbooks on the classroom practices is tremendous. Preparation for Board examinations is incomplete without reading these books and doing the exercises given in them.



Taking this into consideration, these NCERT solutions for Class 10 Science (<https://www.learncbse.in/ncert-solutions-class-10-science/>) has been designed to be an indispensable tool for the students. Care has been taken that the answers to the questions are written in a proper form and as per the marking scheme suggested by the CBSE.

With the aim of imbibing skills and hard work among the students, the solutions has been designed. It covers the Chapter wise solutions of NCERT Textbook questions and contains Chapter wise solutions of CBSE (CCE) examination questions. Utmost care has been taken to cover all the previous year's questions.

Constructive and thoughtful suggestions for further improvement are welcome.

### **More Resources for CBSE Class 10**

- [NCERT Solutions Home Page](#)
- [NCERT Solutions for Class 10 Science](#)
- [NCERT Solutions for Class 10 Maths](#)
- [NCERT Solutions for Class 10 Social](#)
- [NCERT Solutions for Class 10 English](#)
- [NCERT Solutions for Class 10 Hindi](#)
- [NCERT Solutions for Class 10 Sanskrit](#)
- [NCERT Solutions for Class 10 Foundation of IT](#)
- [RD Sharma Class 10 Solutions](#)

# NCERT Solutions for Class 10 Social Science



LearnCBSE.in Class 10 Social Science

## NCERT Solutions for Class 10 Social Science History: India and the Contemporary World-II

- [Chapter 1 The Rise of Nationalism in Europe](#)
- [Chapter 2 The Nationalist Movement in Indo-China](#)
- [Chapter 3 Nationalism in India](#)
- [Chapter 4 The Making of Global World](#)
- [Chapter 5 The Age of Industrialisation](#)
- [Chapter 6 Work, Life and Leisure](#)
- [Chapter 7 Print Culture and the Modern World](#)
- [Chapter 8 Novels, Society and History](#)

## NCERT Solutions for Class 10 Social Science Geography: Contemporary India-II

- [Chapter 1 Resource and Development](#)
- [Chapter 2 Forest and Wildlife Resources \(Extra Questions for Forest and Wildlife Resources\)](#)
- [Chapter 3 Water Resources \(Extra Questions for Water Resources\)](#)
- [Chapter 4 Agriculture \(Extra Questions for Agriculture\)](#)
- [Chapter 5 Minerals and Energy Resources \(Extra Questions for Minerals and Energy Resources\)](#)
- [Chapter 6 Manufacturing Industries \(Extra Questions for Manufacturing Industries\)](#)
- [Chapter 7 Lifelines of National Economy](#)

## NCERT Solutions for Class 10 Social Science Civics (Political Science): Democratic Politics-II

- [Chapter 1 Power Sharing](#)
- [Chapter 2 Federalism \(Extra Questions for Federalism\)](#)
- [Chapter 3 Democracy and Diversity \(Extra Questions for Democracy and Diversity\)](#)
- [Chapter 4 Gender Religion and Caste \(Extra questions for Gender Religion and Caste\)](#)
- [Chapter 5 Popular Struggles and Movements \( Extra Questions for Popular Struggles and Movement\)](#)

# NCERT Solutions for Class 10 Social Science Economics: Understanding Economic Development – II

- [Chapter 1 Understanding Economic Development](#)
- [Chapter 2 Sectors of Indian Economy](#)
- [Chapter 3 Money and Credit](#)
- [Chapter 4 Globalization and the Indian Economy](#)
- [Chapter 5 Consumer Rights](#)

# NCERT Solutions for Class 10 Social Science Disaster Management

- [Tsunami – The Killer sea Waves](#)
- [Survival Skills \(Extra Questions Survival Skills\)](#)
- [Alternative Communication Systems \(Extra Questions Alternative Communication Systems\)](#)
- [Safe Construction Practices \(Extra Questions Safe Construction Practices\)](#)
- [Sharing Responsibilities \(Extra Questions Sharing Responsibilities\)](#)
- [Planning Ahead](#)

# NCERT Solutions for Class 10 Social Science Democratic Politics

<b>Social Science (SST) - Civics NCERT Solutions for Class 10 Social Science Democratic Politics</b>								
<b>Chapter No</b>	<b>Chapter Name</b>	<b>Type of Questions</b>						
Chapter 1	Power Sharing	<a href="#">NCERT Solutions</a>	<a href="#">LAQ</a>	<a href="#">SAQ</a>	<a href="#">VSAQ</a>	<a href="#">HOTS</a>	<a href="#">VBQ</a>	<a href="#">NOTES</a>
Chapter 2	Federalism	<a href="#">NCERT Solutions</a>	<a href="#">LAQ</a>	<a href="#">SAQ</a>	<a href="#">VSAQ</a>	<a href="#">HOTS</a>	<a href="#">VBQ</a>	<a href="#">NOTES</a>
Chapter 3	Democracy and Diversity	<a href="#">NCERT Solutions</a>	<a href="#">LAQ</a>	<a href="#">SAQ</a>	<a href="#">VSAQ</a>	<a href="#">HOTS</a>	<a href="#">VBQ</a>	<a href="#">NOTES</a>
Chapter 4	Gender Religion and Caste	<a href="#">NCERT Solutions</a>	<a href="#">LAQ</a>	<a href="#">SAQ</a>	<a href="#">VSAQ</a>	<a href="#">HOTS</a>	<a href="#">VBQ</a>	<a href="#">NOTES</a>
Chapter 5	Popular Struggles and Movements	<a href="#">NCERT Solutions</a>	<a href="#">LAQ</a>	<a href="#">SAQ</a>	<a href="#">VSAQ</a>	<a href="#">HOTS</a>	<a href="#">VBQ</a>	<a href="#">NOTES</a>



## Social Science (SST) - Geography

Chapter No	Chapter Name	Type of Questions						
Chapter 1	Resource and Development	<a href="#">NCERT Solutions</a>	<a href="#">LAQ</a>	<a href="#">SAQ</a>	<a href="#">VSAQ</a>	<a href="#">HOTS</a>	<a href="#">VBQ</a>	<a href="#">NOTES</a>
Chapter 2	Forest and Wildlife Resources	<a href="#">NCERT Solutions</a>	<a href="#">LAQ</a>	<a href="#">SAQ</a>	<a href="#">VSAQ</a>	<a href="#">HOTS</a>	<a href="#">VBQ</a>	<a href="#">NOTES</a>
Chapter 3	Water Resources	<a href="#">NCERT Solutions</a>	<a href="#">LAQ</a>	<a href="#">SAQ</a>	<a href="#">VSAQ</a>	<a href="#">HOTS</a>	<a href="#">VBQ</a>	<a href="#">NOTES</a>
Chapter 4	Agriculture	<a href="#">NCERT Solutions</a>	<a href="#">LAQ</a>	<a href="#">SAQ</a>	<a href="#">VSAQ</a>	<a href="#">HOTS</a>	<a href="#">VBQ</a>	<a href="#">NOTES</a>
Chapter 5	Minerals and Energy Resources	<a href="#">NCERT Solutions</a>	<a href="#">LAQ</a>	<a href="#">SAQ</a>	<a href="#">VSAQ</a>	<a href="#">HOTS</a>	<a href="#">VBQ</a>	<a href="#">NOTES</a>
Chapter 6	Manufacturing Industries	<a href="#">NCERT Solutions</a>	<a href="#">LAQ</a>	<a href="#">SAQ</a>	<a href="#">VSAQ</a>	<a href="#">HOTS</a>	<a href="#">VBQ</a>	<a href="#">NOTES</a>
Chapter 7	Lifelines of National Economy	<a href="#">NCERT Solutions</a>	<a href="#">LAQ</a>	<a href="#">SAQ</a>	<a href="#">VSAQ</a>	<a href="#">HOTS</a>	<a href="#">VBQ</a>	<a href="#">NOTES</a>

## Social Science (SST) - History NCERT Solutions for Class 10 Social Science India and the Contemporary World - II

Chapter No	Chapter Name	Type of Questions						
Chapter 1	The Rise of Nationalism in Europe	<a href="#">NCERT Solutions</a>	<a href="#">LAQ</a>	<a href="#">SAQ</a>	<a href="#">VSAQ</a>	<a href="#">HOTS</a>	<a href="#">VBQ</a>	<a href="#">NOTES</a>
Chapter 2	The Nationalist Movement in Indo-China	<a href="#">NCERT Solutions</a>	<a href="#">LAQ</a>	<a href="#">SAQ</a>	<a href="#">VSAQ</a>	<a href="#">HOTS</a>	<a href="#">VBQ</a>	<a href="#">NOTES</a>
Chapter 3	Nationalism in India	<a href="#">NCERT Solutions</a>	<a href="#">LAQ</a>	<a href="#">SAQ</a>	<a href="#">VSAQ</a>	<a href="#">HOTS</a>	<a href="#">VBQ</a>	<a href="#">NOTES</a>
Chapter 4	The Making of Global World	<a href="#">NCERT Solutions</a>	<a href="#">LAQ</a>	<a href="#">SAQ</a>	<a href="#">VSAQ</a>	<a href="#">HOTS</a>	<a href="#">VBQ</a>	<a href="#">NOTES</a>
Chapter 5	The Age of Industrialisation	<a href="#">NCERT Solutions</a>	<a href="#">LAQ</a>	<a href="#">SAQ</a>	<a href="#">VSAQ</a>	<a href="#">HOTS</a>	<a href="#">VBQ</a>	<a href="#">NOTES</a>
Chapter 6	Work, Life and Leisure	<a href="#">NCERT Solutions</a>	<a href="#">LAQ</a>	<a href="#">SAQ</a>	<a href="#">VSAQ</a>	<a href="#">HOTS</a>	<a href="#">VBQ</a>	<a href="#">NOTES</a>
Chapter 7	Print Culture and the Modern World	<a href="#">NCERT Solutions</a>	<a href="#">LAQ</a>	<a href="#">SAQ</a>	<a href="#">VSAQ</a>	<a href="#">HOTS</a>	<a href="#">VBQ</a>	<a href="#">NOTES</a>
Chapter 8	Novels, Society and History	<a href="#">NCERT Solutions</a>	<a href="#">LAQ</a>	<a href="#">SAQ</a>	<a href="#">VSAQ</a>	<a href="#">HOTS</a>	<a href="#">VBQ</a>	<a href="#">NOTES</a>

## Social Science (SST) - Economics NCERT Solutions for Class 10 Social Science Understanding Economic Development

Chapter No	Chapter Name	Type of Questions						
Chapter 1	Development	<a href="#">NCERT Solutions</a>	<a href="#">LAQ</a>	<a href="#">SAQ</a>	<a href="#">VSAQ</a>	<a href="#">HOTS</a>	<a href="#">VBQ</a>	<a href="#">NOTES</a>
Chapter 2	Sectors of Indian Economy	<a href="#">NCERT Solutions</a>	<a href="#">LAQ</a>	<a href="#">SAQ</a>	<a href="#">VSAQ</a>	<a href="#">HOTS</a>	<a href="#">VBQ</a>	<a href="#">NOTES</a>
Chapter 3	Money and Credit	<a href="#">NCERT Solutions</a>	<a href="#">LAQ</a>	<a href="#">SAQ</a>	<a href="#">VSAQ</a>	<a href="#">HOTS</a>	<a href="#">VBQ</a>	<a href="#">NOTES</a>
Chapter 4	Globalization and the Indian Economy	<a href="#">NCERT Solutions</a>	<a href="#">LAQ</a>	<a href="#">SAQ</a>	<a href="#">VSAQ</a>	<a href="#">HOTS</a>	<a href="#">VBQ</a>	<a href="#">NOTES</a>
Chapter 5	Consumer Rights	<a href="#">NCERT Solutions</a>	<a href="#">LAQ</a>	<a href="#">SAQ</a>	<a href="#">VSAQ</a>	<a href="#">HOTS</a>	<a href="#">VBQ</a>	<a href="#">NOTES</a>

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