

Birla Public School

BIOLOGY

Holiday home work for X

class X

- 1.A project report of 15 days on different nutrients like –
Carbohydrates ,fats ,proteins ,vitamins in your breakfast,lunch ,dinner.
- 2-Leaening work of syllabus taught

HOLIDAY ASSIGNMENT

Physics

CLASS 10

PROJECT WORK

Each student is required to make a handwritten project report according to the project allotted. Please note down your project number according to your roll number.

1. Project has specific objectives.
2. List the sources of the information collected.
3. General layout of the project report has the following format.

Page number	Content
Cover page	Your name, class, roll no., title of the project
1	Brief description of the project
2-4 (may change)	Procedure (with pictures if required)
5-6	Science involved
7	Conclusion / result
8	List of resources from where the information is collected.

4. The weightage of marks for the project work :
 - i. Identification :1 mark
 - ii. Procedure/ presentation: 3 marks
 - iii. Result: 2marks
 - iv. Viva: 4 marks

Name of the project	Objective	Description
LIGHT	<ol style="list-style-type: none">1. To understand and apply the different laws of reflection and refraction.2. To make the ray diagram of the images3. To understand and visualize the concept and science behind the optical instrument.	<ol style="list-style-type: none">1. (ROLL NO. 1-10) --- REFLECTION- definition, laws of reflection, mirrors-types, image formation, magnification formula.2. (ROLL NO. 11-20) REFRACTION- definition, laws of refraction, lens-types, image formation, magnification formula.3. (ROLL NO. 21-30) REFRACTION IN NATURE – examples with science behind it.4. (ROLL NO. 31-40) LIGHT- optical instruments, optical illusion model

SUMMER VACATION ASSIGNMENT 2017-18

SUBJECT: MATHEMATICS

CLASS -X

PROJECT WORK

Each student is required to make a handwritten project report according to the project allotted. Please note down your project number according to your roll number.

1. Project has specific objectives.
2. List the sources of the information collected.
3. General layout of the project report has the following format.

Page number	Content
Cover page	Your name, class, roll no., title of the project
1	Brief description of the project
2-4 (may change)	Procedure (with pictures if required)
5-6	Mathematics involved
7	Conclusion / result
8	List of resources from where the information is collected.

4. The weightage of marks for the project work :

- v. Identification : 1 mark
- vi. Procedure/ presentation : 3 marks
- vii. Result : 2 marks
- viii. Viva : 4 marks

Project number/ roll number	Project name/ objective	Description/ instruction
1.(roll no. 1-8)	Exploring about the Real numbers	<ol style="list-style-type: none">1. Definition, history2. Views of Different mathematicians.3. Decimal expansion of rational numbers.4. Factor tree of a composite number.5. Application of Euclid's Division algorithm.
2.(roll no. 9-17)	Exploring about Golden ratio.	<ol style="list-style-type: none">1. What is it ?2. History.3. Application and observations.4. Hidden mathematics.
3.(roll no. 18-26)	Exploring efficiency in packing	<ol style="list-style-type: none">1. What is it ?2. Types (2D,3D,Infinite space etc)3. Necessary calculation steps/methods for getting the result. (show

		<p>Calculation of efficiency.)</p> <p>4. Importance in real life situations.</p>
4.(roll no.26 – 34)	Exploring statistical analysis	<p>1. About it.....</p> <p>2. History</p> <p>3.Its important terms</p> <p>4. Necessary calculation steps/ working methods for getting the result. (using bar graph/pictograph/frequency polygon/histogram etc.)</p>

HOLIDAY HOME ASSIGNMENT (May-June 2017)

Class- X

Sub- Chemistry

1. Prepare a model for Chemistry Exhibition

OR

Prepare an experiment to exhibit in Chemistry Exhibition and write it in the practical file.

2. Read chapters “Acids, bases and salts” and “Metals and Non-metals” and summarize in 25-50 statements each.

3. Prepare 50 MCQS (ch-1to5) in word or pdf format and send it to studentsofbabita007@gmail.com by 15th June'17.

Summer Vacation Assignment

Class : X

Social Science

1. What are the common natural disasters which occur in India? Make a mitigation plan for any two disasters. Suppose you live in a region where any such disaster occurs. Develop an evacuation plan with a map for your locality.
2. What are man made disasters? How can we prepare ourselves for facing such disasters ? Present a case study on Bhopal Gas Tragedy and Chernobyl Nuclear Disaster.
3. How a Tsunami is triggered? Collect information about the worst Tsunami which had taken place in India and Japan. Write do's and don'ts during Tsunami.

Holiday Homework for Class XI English

Read any one novel of the following Indian authors:-

- A. R.K. Narayan -OR
- B. Mulkraj Anand -OR
- C. Khushwant Singh

- 1 Write a book review and critical appreciation of the novel in 400 – 450 words.
- 2 Write a character sketch of any ONE character in the novel (in 150 – 200 words)

Summer Vacation Home Assignment for the Session 2017-18 Class XI

Accounts :~

- 1)- Complete back exercise of UNIT-1 (Introduction to Accounting)
- 2)- Revise all the terms given in UNIT-2 (Accounting Terms) and try to explain them in your own words.

Note - Make a separate notebook for completing the following holiday homework

Entrepreneurship :~

- 1)- Write a case history of any famous entrepreneur and mention his/her strong points.
- 2)- Write an article of minimum 250 words on online retailing.
- 3)- Complete back exercise of UNIT-1 (Entrepreneurship : Concept And Functions)

Note - Make a separate notebook for completing the following holiday homework

Business Studies :~

- 1)- Prepare a scrapbook of newspaper clippings of business news that you come across in your vacation break.
- 2)- Write an article on any one prominent or important economic or business news

CLASS – XI
CHEMISTRY
HOLIDAY HOMEWORK

- Q1. Classify the following into elements, compounds and mixtures. Divide mixtures into homogeneous and heterogeneous (i) marble (ii) Honey (iii) Toothpaste (iv) Sugar (v) gold (vi) Niter (vii) Iodized Table salt (viii) Iron (ix) Steel (x) Distilled water (xi) slaked lime (xii) oxygen (xiii) Gasoline (xiv) silk (xv) Tap water.
- Q2. Classify following into metals and non-metals;- (i) Helium (ii) Sodium (iii) Mercury (iv) graphite (v) Carbon (vi) silicon (vii) Magnesium (viii) Phosphorous (ix) Arsenic (x) Antimony
- Q3. How will you separate the constituents present in the following mixtures: - (i) common salt and water (ii) Iodine and sand (iii) sugar and sulphur (iv) Kerosene and water (v) salt + sand + sulphur + Iron
- Q4. With the help of example justify each statement for different laws of chemical combination.
- Q5 (i) How many gram molecules are present in 4.9g of H_2SO_4
(ii) Calculate the mass of 0.72 molecules of CO_2 .
- Q6. Calculate the number of atoms in: - (i) 0.25 mole atoms of C (ii) 0.20 mole molecules of O_2 .
- Q7. How many atoms of carbon and oxygen are present in 1.5 mole of CO_2 ?
- Q8. How many molecules and atoms of phosphorus are present in 0.1 moles of P_4 molecules?
- Q9. How many silver atoms are present in a piece of jewellery weighing 10.78 g? $\text{Ag} = 107.8$ a.m.u.
- Q10. What weight of calcium contains the same number of atoms as per present in 3.2g of sulphur?
- Q11. Calculate the number of atoms present in: - (i) 52 moles of He (ii) 52 a.m.u. of He (iii) 52g of He
- Q12. Calculate the total number of electrons present in 1.6g of methane.
- Q13. How many atoms of each type are present in 143g of washing soda ($\text{NaCO}_3 \cdot 10 \text{H}_2 \text{O}$)?
- Q14. Calculate the no. of moles of phosphorus in 92.9 g of 'P' assuming that molecular formula of 'P' is P_4 . Also calculate the no. of atoms and molecules of P in the sample.
- Q15. What is the mass of 0.04 mol of Co_2 ?
- Q16. Calculate the mass of water molecule?
- Q17. How many molecules of water are there in 1L of water? The density of water is 1.0 g / ml.
- Q18. How many moles of hydrogen are there in 0.925g of $\text{Ca}(\text{OH})_2$? $\text{Ca} = 40$ a.m.u.
- Q19. Calculate the mass of 1 molecule of CS_2 ?
- Q20. 1 million atoms of silver weigh 1.79×10^{-16} g. Calculate the atomic mass of silver.
- All numericals of some basic concepts of chemistry from ncert.

Holiday Home work / Class XI / Mathematics

Sets

- Write the proper subsets of set $A = \{ \emptyset, a \}$
- Write following intervals in set-builder form and represent on the number line :
(1) $(-7, 0)$ (2) $[6, 12]$ (3) $(6, 12]$ (4) $[-20, 3)$.
- Let $A = \{x : x^2 - 8x + 12 = 0\}$; $B = \{2, 4, 6\}$; $C = \{2, 4, 6, 8, \dots\}$; $U = \{1, 2, 3, 4, \dots\}$
(i) Decide ; which are the subsets of which?
(ii) Identify the pair of disjoint sets
(iii) Find: $(B \cap C)'$ (iv) Find: $(A - B)'$
- If $A = \{3, 5, 7, 9, 11\}$, $B = \{7, 9, 11, 13\}$, $C = \{11, 13, 15\}$ $D = \{15, 17\}$. Find $(A \cap B) \cap (B \cup C)$. and verify $(A - B) \cup (B - A) = (A \cup B) - (A \cap B)$
- If $U = \{x : x \in \mathbb{N} \text{ and } 2 \leq x \leq 12\}$, $A = \{x : x \text{ is even prime no}\}$ and $B = \{x : x \text{ is a factor of } 24\}$ then Verify: $A' - B' = B - A$
- Let A and B be two sets such that $n(A) = 20$, $n(A \cup B) = 42$ and $n(A \cap B) = 4$. Find
1) $n(B)$ 2) $n(A - B)$ 3) $n(B - A)$.
- A and B are two sets such that $n(A) = 3$, $n(B) = 6$. Find the max and min values of $n(A \cup B)$
- If $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$, $A = \{2, 4, 6, 8\}$, $B = \{2, 3, 5, 7\}$, Verify De-Morgan's law: $(A \cap B)' = A' \cup B'$.
- Let A, B and C be three sets. If $A \subseteq B$ and $B \subseteq C$, is it true that $A \subseteq C$, If not, give an example.
- Write down the subsets of $\{2, \{3\}\}$. Also find the power set
- Out of 500 car owners investigated, 400 owned car A and 200 owned car B, 50 owned both A and B cars. Is this data correct.
- A and B are two sets of 36 elements such that $n(A - B) = 20 + x$, $n(B - A) = 3x$ and $n(A \cap B) = x + 1$. Draw a Venn - diagram to illustrate this information. Find (i) the value of x , (ii) $n(A \cup B)$.
- A survey of 500 television viewers, produced the following information; 285 watch football, 195 watch hockey, 115 watch basketball, 45 watch football and basketball, 70 watch football and hockey, 50 watch hockey and basketball, 50 do not watch any three games. How many watch all the three games? How many watch exactly one of the three games?
- A college awarded 38 medals in Football, 15 in Basketball and 20 in cricket. If these medals went to 58 men and only 3 men got medals in all the three sports, how many received medals in exactly two of the 3 sports?

Relations and Functions

- Define Modulus function. Draw its graph & mapping. What is its domain & range?;
- Define Signum function. Draw its graph & mapping. What is its domain & range?
- Let $A = \{1, 2, 3\}$ $B = \{3, 4\}$; and $C = \{4, 5, 6\}$
Find $(A \times B) \cup (A \times C)$.
- If $P = \{1, 0\}$, form the set $P \times P \times P$.
- Let $A = \{1, 2\}$ and $B = \{3, 4\}$. Find the number of relations from A to B.
- Find the domain of the function :

a. $f(x) = \frac{x^2 + 3x + 5}{x^2 - 5x + 4}$

c. $f(x) = \frac{1}{\sqrt{x + |x|}}$

b. $f(x) = \frac{x^2 + 2x + 1}{x^2 + 12x + 35}$

d. $f(x) = [x] + x$

7. Find the domain and the range of following functions:

a. $f(x) = |x - 3|$

c. $f(x) = \frac{3}{2 - x^2}$

b. $f(x) = \frac{1}{\sqrt{3x - 4}}$

d. $f(x) = x^2 + 6$

e. $f(x) = \sqrt{x}$

f. $f(x) = \sqrt{16 - x^2}$

8. Let $f, g : \mathbb{R} \rightarrow \mathbb{R}$ be defined, respectively by $f(x) = x^3 + 1, g(x) = 2x - 3$. Find $f + g, (f - g), f \cdot g, \frac{f}{g}, f \circ g$

9. If $f(x) = [x]$ and $g(x) = |x|$, where $[x]$ is the greatest integer function and $|x|$ is the modulus function then find:

$$(f \circ g)\left(\frac{7}{2}\right) - g \circ f\left(\frac{-7}{2}\right)$$

10. Let $f = \{ (1, 2); (3, 4); (-5, 6) (0, 2) \}$ be a linear function from \mathbb{Z} into \mathbb{Z} . Find $f(x)$.

Topics for mathematics for class – XI

1. Relations vs functions
2. Exploring functions.
3. Application of set theory
4. Circular functions

BIOLOGY

Holiday home work for XI

class XI

1. Project on diversity of forests in India
2. To collect a medicinal or aeromatic plant with their description
3. Collection of different types of monocot and dicot seeds.

PHYSICAL EDUCATION

Class – XI

Summer Assignment

1. Prepare a report on WADA and NADA (chapter-5).
2. Prepare a report on Yoga covering the following points :
 - (i) Importance
 - (ii) Elements
 - (iii) Prevention and Management of common lifestyle diseases.
3. Importance of Test & Measurement, Calculation of BMI and waist-hip ratio.
4. A brief Report on Olympic Movement
 - (a) Ancient and Modern Olymipcs.
 - (b) Olympic symbol, deals, objectives and values.
 - (c) Dronacharaya Award and Arjun Award.
5. Everyday perform Yoga Asanas at least for 30 minutes.

Economics home assignment
Class XI
Project format

1. Front page
2. Index
3. Acknowledgement
4. Survey sheet
5. Introduction
6. Data impetration of 20 articles (including pie chart)
7. Conclusion

Questions

(Market Survey of Household Vehicles)

Name _____

E-MAIL _____

Place _____

Occupation _____

1. Which Company's TV do you prefer?

2. Which Company's Dish TV do you prefer?

3. Which Company's Smartphone do you use?

4. Which Company's SIM is with you?

5. Which Company's Laptop do you use?

6. Which Company's Wi-Fi connection you have?

7. Which Company's refrigerator is in use at your home?

8. Which Company's Air conditioner is at your home?

9. Which Company's Washing Machine is at your home?

10. Which Company's Microwave is at your home?

11. Which Company's Edible oil is at your home?

12. Which Company's Inverter is at your home?

13. Which Company's Water purifier R.O. is at your home?

14. Which Company's Mixer Grinder is at your home?

15. Which Company's Bike do you prefer?

16. Which Company's Scooty do you prefer?

17. Which Company's Car do you prefer?

18. Do you have insurance for your Motor vehicles? If yes then of which company?

19. Do you have Life insurance? If yes then of which company?

20. Do you have Health insurance? If yes then of which company?

ASSIGNMENT (SUMMER VACATION)
Session 2017-18 (Physics -class XI B)

S.NO	ROLL NO.	TOPICS
1.	1-3	Artificial intelligence: The next generation future of robotics
2.	4-6	S.N. Bose: His contribution in the field of physics
3.	7-9	ISRO: Role in the development of Indian astrophysics
4.	10-12	DRDO: contribution in Indian Defense forces
5.	13-15	C.V. Raman : His early life and contribution in the field of physics
6.	16-18	Marine technology: Role of physics in its upcoming technology
7.	19-21	Automation of industries: its benefits and drawbacks
8.	22-24	Medical technology: Role of physics
9.	25-28	Homi Jhangir Bhabha: His contribution in Indian space technology

Students are advised to make individual PPT of at least 10-15 pages on above given topics and mail the same to hitendersinghjodha@gmail.com before 15.06.2017.

Vidya Niketan
Birla Public School, Pilani
Class XII Economics Project

Do a Project on:

- Demonetization and its Impacts on Indian Economy.
- Make in India Campaign and its Impacts on Indian Economy.

Class XII Physics

Work-sheet on wave-optics

- Q1. How is wavefront related to the direction of the corresponding rays? Can two wavefronts of the same wave cross each other?
- Q2. What is the phase difference between any two points on a wavefront? What is the shape of wavefront emerging out from (i) point source (ii) linear source of light? Draw a type of wavefront that corresponds to a beam of monochromatic light (i) coming from a very far off source and (ii) diverging radially from a point source.
- Q3. Illustrate with the help of diagram the action of (i) convex lens and (ii) concave mirror on a plane wavefront incident on it.
- Q4. State Huygen's principle. For reflection of a plane wavefront at a plane reflecting surface, construct the corresponding reflected wavefront. Prove that angle of incidence is equal to angle of reflection.
- Q5. With the help of suitable diagram, prove Snell's law of refraction using Huygen's principle.
- Q6. Define fringe width. Derive an expression for fringe width in Young's double slit exp.
- Q7. What do you mean by coherent source? Two independent sources of light cannot be coherent. Explain why?
- Q8. Write conditions to obtain sustained interference.
- Q9. Differentiate between polarised light and non-polarised light.
- Q10. Describe an experiment to show that light waves are transverse in nature.
- Q11. Explain with the help of a suitable ray diagram how an unpolarised light can be polarised by reflection from a transparent medium. Write an expression for the Brewster angle in terms of the refractive index of denser medium.
- Q12. Differentiate between interference and diffraction.

13. What do you mean by diffraction of light? Explain diffraction at a single slit. Derive relation for the linear width of central maxima.
Derive relation for the angular width of central maxima.
14. Draw a graph showing the variation of intensity with diffraction angle θ in a single slit diffraction experiment.
15. Show that the central maximum in a single slit diffraction is twice as wide as the secondary maximum and the pattern becomes narrower as the width of the slit is increased.
16. If the angle between the pass axes of polarizer and the analyser is 45° , write the ratio of the intensities of original light and the transmitted light after passing through the analyser. (4:1)
17. A partially plane polarised beam of light is passed through a polaroid. Show graphically the variation of the transmitted light intensity with angle of rotation of the polaroid.
18. Two polaroids are placed at 90° to each other and the transmitted intensity is zero. What happens when one more polaroid is placed between these two, bisecting the angle between them? How will the intensity of transmitted light vary on further rotating the third polaroid?
19. State essential condition for the diffraction of light takes place. 'Diffraction defies the limit of the ray optics.' Give a brief explanation of this statement.
For a given medium, the polarising angle is 60° . What will be the refractive index and the critical angle for this medium?
20. Assuming the diameter of the eye pupil to be 2.0 cm , calculate the smallest angular separation at which two point objects can be distinctly seen when viewed in light of wavelength 6000 \AA .
21. In a Young's double slit experiment, the intensity of light at a point on the screen where the path difference is λ is K units. Find the intensity at a point where the path diff.

λ - (i) $\lambda/4$ (ii) $\lambda/3$ & (iii) $\lambda/2$.

22. Yellow light of wavelength 6000 \AA produces fringes of width 0.8 mm in Young's double slit experiment. What will be the fringe width if the light source is replaced by another monochromatic source of light 7500 \AA and the separation between the slits is doubled?

23. (i) In YDSE, the width of the fringes obtained with light of $\lambda = 6000 \text{ \AA}$ is 2.0 mm . Calculate the fringe width if the entire apparatus is immersed in a liquid of R.I. 1.33.

(ii) In YDSE, the slits are 0.2 mm apart and the screen is 1.5 m away. It is observed that the distance between the central bright fringe and fourth dark fringe is 1.8 cm . Find the λ of light used.

24. A slit of width 'd' is illuminated by red light of wavelength 6500 \AA . For what value of 'd' will (i) the first minima fall at an angle of diffraction 30° and (ii) the first maximum fall at angle of diffraction 30° .

2) Determine the angular separation between central maxima and first order minima of the diffraction pattern due to a single slit of width 0.25 mm when light of $\lambda = 5890 \text{ \AA}$ is incident on it normally.

25. Two wavelengths of sodium light 590 nm , 596 nm are used, in the turn, to study the diffraction taking place at a single slit of aperture $2 \times 10^{-4} \text{ m}$. The distance between the slit and the screen is 1.5 m . Calculate the separation between the positions of first maximum of the diffraction pattern obtained in the two cases.

26. In a two slit exp. with monochromatic light, fringes are obtained on a screen placed at a some distance apart. If the screen is moved by $5 \times 10^{-2} \text{ m}$ towards the slits, the change in fringe width is $3 \times 10^{-3} \text{ m}$. If the distance $d = 10^{-3} \text{ m}$. Calculate λ of the light.

BIOLOGY
Holiday home work for XII

class XII

1. Project on-

a- Bio technology and its application

b- Pollution - causes and prevention

c- Reproductive health

d- Microbes in Human welfare

e- Global warming

2. Learning work of syllabus taught

SUMMER HOME ASSIGNMENT–2017-2018

Subject : ACCOUNTANCY

CLASS – XII

PARTNERSHIP

- Q.1 A and B are two partners in a partnership from “A” contributed capital Rs. 2,00,000 and B” contributed Rs. 50,000 as capital. On 31.12.2009 the profit of the firm Rs. 70,000. How the profit will distribute among the partners. There is no partnership deed among the partners.
- Q.2 A and B are two partners sharing profit and Loss 3:2. On 1.1.2009 capital of A and B were Rs. 100000 and 80000. In addition to the capital “B” given Loan Rs. 40000 to the firm. “B” demanded 10% p.a. as interest on Loan. As there is no partnership deed regarding interest n Loan. How much “B” will get. Profit of the firm as on 31.12.2009 was Rs. 50,000.
- Q.3 Name any six items to be shown in the P/L appropriation A/C.
- Q.4 A, B and C were partners sharing profit and Loss 5:3:2.
(a) “A” Drawn Rs. 2000 beginning of each month.
(b) “B” Drawn “Rs. 2000 middle of each month.
(c) “C” Drawn Rs. 2000 end of each quarters.
Interest on Drawing 10% p.a.. Calculate interest on drawing for A,B and C.
- Q.5 A,B and C partners sharing P/L 5:3:2. Their capital on 01.01.2009 were Rs. 100000, Rs. 80000 and Rs. 50,000. On 31.12.2009 profit of the firm was 30000 distributed among the partners by ignoring interest on capital 10% p.a. Prepare Table showing adjustment and adjusted journal entry.
- Q.6 M, and N are two partners sharing profit and Loss Equally. “O” admitted as a new partners with 1/5th share of future profit. “O” was given gurantee by M and N that his share will be not less than Rs. 10000 as profit. Profit of the firm on 31.12.2001 was Rs. 30000. prepareP&L appropriation A/C and adjusted journal entry.
- Q.7 A,B and C are three partners sharing Profit and Loss 5:3:2 and they were contributed capital on 1st January 2013 Rs. 100000, Rs. 80,000 and Rs. 50,000 respectively. As per the partnership deed A is entitled to get salary Rs. 2000 per month B is entitle to get Rs. 10000 as commission. Interest on capital 10% per annual. C had given Rs. 50,000 as loan to the partnership. Net profit on 31st Dec 2013 was Rs.90,000. Prepare a Profit and Loss appropriation and capital A/C.
8. Where would you record interest on capital when Capitals are fluctuating?
- 9 Give one point of difference between sacrificing ratio and gaining ratio.
10. Define Goodwill
- 11 Shiv and Hari entered into partnership on 1st January, 2000, contributing Rs. 500000 and Rs 200000 respectively. Hari also introduced Rs. 100000 as additional capital on 1st April 2000. They agreed to share profits and losses in the ratio of 3:2 . Following information is provided regarding the partnership :

Shiv and Hari, each are allowed a salary of Rs. 5,000 per quarter.

Interest is to be allowed on Capital @ 8% p.a. and charged on drawing at 10% p.a.

Drawing of Shiv and Hari during the year were Rs. 12,000 and Rs. 10,000 respectively, Profits as at 31st December, 2000 before the above mentioned adjustments was Rs. 196000. Prepare P & L appropriation A/C

12. Define partnership deed and what rule will be applicable in absence of deed, with the following items?

(a) Profit sharing ratio

(b) Interest on loan

13. P, Q and R are partners sharing Profit and Losses in the ratio 4:3:3. Their Capitals are fixed at Rs 1 Lakh, Rs 2 Lakh and Rs 3 Lakh respectively for the year 2005 interest on capital credited to them 10% instead of 9%. Pass the necessary general entry.

14. Ram and Shyam started a partnership on 1 January 2007 with a capital contribution of Rs 2 lakh and Rs 3 Lakh respectively. The deed provide the following.

The profit sharing ratio 3:2

Interest on capital allowed at 12% per annum.

Ram to get salary of Rs 2000 per month and Shyam Rs 1500 per month.

Profit for the year ended on 31-12-2007. before making the above adjustment was

Rs 2,16,000. Interest on drawing for Ram Rs 2200 and to Shyam Rs 2500. Prepare profit and loss Appropriation Account and Capital Accounts of the Partners

15. OP, Q and R are partners in a firm. Their Capitals are Rs 30,000, Rs 15,000 and Rs 15,000 on 1-1-2008 respectively. As per the provision of the deed

R was to allowed a remuneration of Rs 3,000 per annum.

Interest at the rate 5% per annum was provided on capital.

Profit to be shared in 2:2:1.

Ignoring the above terms net profit of Rs 18,000 for the year ended on 31-12-2008 was divided among three partners equally pass an adjustment entry to rectify the error.

16. A, B and C partners sharing profit and loss in the ratio 3:3:2. C was given guarantee of Rs 20000 by A & B. Profit at the end of the year was Rs 80000. Prepare p&L app a/c and adjusted journal entry

17. Calculated interest on drawing from the following information. R is a partner withdrawn money in the following date

01.02.2012	2000
31.05.2012	6000
30.06.2012	3000
01.09.2012	4000
30.11.2012	1000
31.12.2012	5000

Account closed on 31.12.2012. Interest on drawing 10%

RATOI ANALYSIS

Q1. What do you mean by Current Asset?

Q2. Give two examples of Current Liability.

Q3. How is inventory or Stock Turnover Ratio is computed?

Q4. How will you calculate the Capital Employed.

Q5. The Current Ratio of a company is 2:1. State with reason, whether the sale of goods Rs 11000 (Cost Rs 10000) would improve, reduce or not change the ratio.

Q.6 The current ratio of A Ltd. is 4.5 : 1 and liquid ratio is 3:1 . Inventory is Rs. 36000. Find out its Current Assets and Current liabilities ?

Q.7 Calculate Gross profit ratio based on the following information :-

Cash sales = 25% of total sales

Purchases = 276000

Credit sales = 240000

Excess of closing inventory over opening inventory Rs. 20000.

Q8. On the basis of information given below calculate the following Ratios.

(a) Gross Profit Ratio (b) Debt equity Ratio

(c) Working capital Turnover Ratio (d) Current Ratio

Net Sales Rs. 665000

Cost of Goods Sold Rs. 495000

Current liabilities Rs. 275000

Mortgage Loan Rs. 225000

Current Assets Rs. 425000

Equity Share Capital Rs. 300000

General Reserve Rs 65000

Debentures Rs. 129000

Q9 . From the following information, calculate the stock Turnover ratio

Sales Rs. 300000

Gross Profit 25% on cost

Opening stock 1/3 of the value of closing stock

Closing stock 30% of sales.

Q.10 Determine the amount of Revenue from Operations from the following particulars:-

Opening Inventory Rs. 40,000

Inventory Turnover Ratio 6 times

Gross Profit 20% of sales

You are informed that closing inventory is two times in comparison to opening

CASH FLOW STATEMENT

Q1 Interest received by State Bank of India will be shown under:

- (a) Operating Activity (b) Investing Activity
(c) Financing Activity (d) None of the above

Q2 Mention two such items which reduce the profit of the business but do not reduce cash.

Q.3 Prepare a Cash-Flow Statement from the following Balance Sheets of Dry Fruits Ltd.:-

Particulars	Note	31.03.2015	31.03.2014
-------------	------	------------	------------

	No.	Rs.	Rs.
I. EQUITY AND LIABILITIES :-			
(1) Shareholder's Funds :			
(a) Share Capital		2,00,000	2,00,000
(b) Reserve and Surplus	1	84,000	(8,000)
(2) Non-Current Liabilities :			
Long-term Borrowings	2	1,35,000	1,00,000
(3) Current Liabilities			
Trade Payables		68,000	62,000
		-----	-----
TOTAL		4,87,000	3,54,000
		=====	=====
II. ASSETS :-			
(1) Non-Current Assets :			
Fixed Assets	3	1,20,000	1,30,000
(2) Current Assets :			
(a) Current Investments (Marketable Securities)		22,000	15,000
(b) Inventories		61,000	80,000
(c) Trade Receivables		40,000	29,000
(d) Cash & Cash Equivalents		2,44,000	1,00,000
		-----	-----
TOTAL		4,87,000	3,54,000
		=====	=====

Note : (1) Reserve & Surplus	31.03.2015	31.03.2014
General Reserve	24,000	-
Profit & Loss Balance	60,000	(8,000)
	-----	-----
	84,000	(8,000)
	=====	=====
(2) Long-term Borrowings :		
12% Mortgage Loan	1,35,000	1,00,000
	=====	=====
(3) Fixed Assets :		
Machinery	1,45,000	1,60,000
Less: Accumulated Depreciation	25,000	30,000
	-----	-----
	1,20,000	1,30,000
	=====	=====

Additional Information :-

- I. Interest paid on mortgage loan amounted to Rs. 14,100.
- II. Dividend paid during the year Rs. 20,000.
- III. Machinery costing Rs. 40,000 (accumulated depreciation thereon being Rs. 18,000) was sold for Rs. 5,000.

Q.4 From the following Balance Sheets of Vijay Ltd., as on 31st March , 2009 and 31st March 2010, prepare a Cash Flow Statement :

Particulars	Notes No.	31 st March 2010 (Rs.)	31 st March 2009 (Rs.)
I. EQUITY AND LIABILITIES			
1. Shareholders' Funds			
(a) Share Capital	1	65000	45000
(b) Reserves and Surplus		42500	25000
2. Current Liabilities			
(a) Trade Payables		11000	8700
		-----	-----
		118500	78700
		=====	=====
I. ASSETS			
1. Non-current Assets			
(a) Fixed Assets		83000	46700
2. Current Assets			
(a) Inventories (Stock)		13000	11000
(b) Trade Receivables (Debtors)		19500	18000
(c) Cash and Cash Equivalents		3000	2000
(d) Other Current Assets	2	-	1000
		-----	-----
		118500	78700
		=====	=====

Notes to Accounts

Particulars	31 st March 2010 (Rs.)	31 st March 2009 (Rs.)
1. Reserves and Surplus :		
General Reserve	27500	15000
Surplus (Statement of Profit and Loss)	15000	10000
	-----	-----
	42500	25000
	=====	=====
2. Other current Assets : :		
Share issue Expenses	-	1000
	-----	-----
	=====	=====

Additional Information :

Depreciation on fixed assets for the year 2009-2010 was Rs. 14700/-

An interim dividend of Rs. 7000 has been paid to the shareholders during the year.

5. From the following Balance Sheets of A Ltd. prepare Cash Flow Statement as per AS-3

Particulars	Notes No.	31 st March 2015 (Rs.)	31 st March 2014 (Rs.)
I. EQUITY AND LIABILITIES			
1. Shareholders' Funds			
(a) Share Capital	1	80000	80000

(b) Reserves and Surplus		80000	30000
2. Non-current Liabilities			
(a) Long-term Borrowings 10% Loan		-	75000
3. Current Liabilities			
(a) Short term Borrowings (Bank Overdraft)		25000	37000
(b) Trade Payables	2	90000	46000
(c) Short term Provisions		45000	32000
		-----	-----
Total		320000	300000
		-----	-----
II ASSETS			
Non current Assets			
Fixed Assets Plant and Machinery		90000	150000
Current Assets			
Inventories		120000	80000
Trade Receivables	3	97000	65000
Cash and Cash Equivalentents		13000	5000
		-----	-----
Total		320000	300000
		=====	=====

Notes to Accounts

Particulars	31 st March 2015 (Rs.)	31 st March 2014 (Rs.)
I. ASSETS		
1. Reserves and Surplus		
Surplus, i.e. Balance instatement of Profit and Loss	80000	30000
	=====	=====
2. Short term Provisions	30000	20000
Proposed Dividends	15000	12000
Provision for Tax	-----	-----
	45000	32000
	=====	=====
3. Trade Receivables		
Debtors	86000	50000
Bills Receivable	11000	15000
	-----	-----
	97000	65000
	=====	=====

Additional Information :

Depreciation of Rs. 10,000 has been charged on Plant and Machinery

Summer Vacation Home Assignment for the session 2017-18

Class XII

Business Studies: ~

- 1) - One sample project to be made on any other topic except mentioned below covered in 1st – 3rd UNIT.
- 2) - Prepare a project on principles of management.
- 3) - Complete all worksheets of UNIT-1 to UNIT-3 from your prescribed book.

Entrepreneurship : ~

- 1) - Prepare a market survey report on use of FMCG product. At least 10 persons are to be interviewed

CLASS – XII
CHEMISTRY
HOLIDAY HOMEWORK

1. Give difference between electronic conductance and electrolytic conductance.
2. Define resistivity and give its SI unit.
3. Define conductivity. How does it vary with concentration of an electrolyte?
4. What are super conductors? What types of materials behave as super conductors?
5. NaCl and MgSO₄ have different values of λ . Justify.
6. Define over voltage.
7. A mercury cell gives a cell potential of 1.35 V which remains constant during its life. Justify.
8. How much faraday of charge is consumed per 1 mole of H₂SO₄ when lead storage battery is in use?
10. Give relevant points for the following:-
 - (a) Similarities between galvanic cell and fuel cell
 - (b) Dissimilarities between galvanic and fuel cell.
 - (c) Advantages of fuel cell.
 - (d) Disadvantages of fuel cell.
11. A 500 gm of toothpaste sample has 0.2 g of fluoride concentration. What is the concentration of fluoride in terms of ppm level?
12. Two liquids A and B boil at 135°C and 185°C respectively. Which of them has a higher vapour pressure at 80°C?
13. Write the possible structural arrangement of a mixture of chloroform and acetone to form a solution.
14. What is Van't Hoff's factor for a compound which undergoes tetramerization in an organic solvent?
15. Aquatic species are more comfortable in cold waters rather than in warm water. Give reason.
16. In the normal spinel structure, the oxide ions are arranged in CCP pattern. The Zn²⁺ ions occupy one eighth of the tetrahedral holes and one half of the octahedral voids are occupied by Al³⁺. Give the formula of the spinel.
17. Metallic gold crystallizes in FCC lattice. How many nearest neighbours do each gold atom has?
18. When a crystal of NaCl is heated in sodium vapour, it acquires a yellow colour. The yellow colour is due to non stoichiometric defect. Name the defect.
19. In the face centered cubic arrangement of A and B atoms where A atoms are at the corner of the unit cell and B atoms at the face centres. One of the A atom is missing from one corner in the unit cell. What is the simplest formula of the compound.

All numericals of solid state chemistry, solution and electrochemistry from ncert
Chemistry class 12 and investigatory project

Assignment (summer vacation)

Class XII - Physics

QUESTION ON OPTICS

ONE MARK QUESTIONS

1. What is the polarizing angle of a medium of refractive index 1.732?
2. Sketch the variation of intensity of interference pattern in Young's double slit experiment.
3. What is the ratio of fringe width of bright and dark fringes in Young's double slit experiment?
4. What is the effect on interference fringes in Young's double slit experiment if one slit is covered?
5. A polarizer and analyzer are so oriented that intensity of transmitted light is maximum. If the analyzer is rotated through 60° what fraction of maximum light is transmitted?
6. Draw a graph showing variation of intensity of polarized light transmitted by an analyzer.
7. What happens to the energy at destructive interference in interference pattern?

TWO MARK QUESTIONS

8. What will be the effect on interference fringes in Young's double slit experiment if (i) Monochromatic source is replaced by white light; (ii) Screen is moved away from the slit. Justify your answer.
9. Name one device for producing polarized light. Two polaroids are placed perpendicular to each other and the transmitted intensity is zero. What happens when one more Polaroid is placed between these two at an angle of 45° ?
10. In Young's experiment the width of the fringes obtained with light of wavelength 6000 \AA is 2mm. What will be the fringe width if the apparatus is immersed in a liquid of refractive index $4/3$?
11. Show that the maximum intensity in interference pattern is four times the intensity due to each slit.
12. In a single slit diffraction experiment, the width of the slit is made double the original width. How does this affect the size and intensity of central diffraction band?
13. How does the resolving power of a microscope change on (i) decreasing the wavelength of light (ii) decreasing the diameter of the objective lens?
14. Draw the wavefront for a beam of light (i) coming from a convex lens when a point source is placed at its focus (ii) divergent radially from a point source.
15. The refractive index of a denser medium is 1.732. Calculate (i) Polarising angle of the medium (ii) angle of refraction.
16. Determine the angular separation between the central maximum, and first order maximum of diffraction pattern due to a single slit of width 0.25mm.
17. State two conditions for sustained interference of light. Draw the variation of intensity with position in Young's double slit experiment.

THREE MARK QUESTIONS

18. State Huygens principle. For reflection of plane wavefront at a plane reflecting surface, construct the corresponding reflected wavefront. Using this diagram prove that angle of incidence is equal to angle of reflection.
19. Two independent sources of light cannot be coherent. Why? Two coherent sources have intensities in the ratio 25:16. Find the ratios of the intensities of maxima to minima after interference.
20. In a single slit diffraction experiment width of the slit is made double the original width. How does it affect the size and intensity of central diffraction band. Explain. Draw a graph showing variation of intensity with angle in single slit diffraction.
21. What is meant by plane polarized light. What type of waves show the property of polarization? Describe a method to produce plane polarized light.
22. Define polarizing angle. Derive the relation connecting polarizing angle and refractive index of the medium.
23. State Huygens's principle. Deduce the laws of refraction on the basis of Huygens's principle.
24. When two narrow slits 2mm apart are illuminated by a light of wavelength 5000 \AA the third minima is measured to be 0.5mm from the central maxima on a screen. What is the distance of the screen from the slit?
25. How does the resolving power of a microscope change when (i) the wavelength of the light is increased (ii) the microscope is kept inside water (iii) diameter of the objective lense is doubled.
26. In Young's double slit experiment when a source of light of wavelength 5000 \AA is used the fringe width obtained is 0.6cm. If the distance between slit and screen is reduced to half what would be the wavelength of source to get a 0.003 m wide fringes.

OR

27. State the essential condition for diffraction of light to occur. The light of wavelength 600nm is incident normally on a slit if width 3mm. calculate the linear width of central maximum when the screen is 3m away from the slit.

FIVE MARK QUESTIONS

28. Explain the phenomenon of diffraction of light at a single slit. Show graphically the variation of intensity with angle in the diffraction pattern.
What is meant by the term angular resolution of a telescope?
29. What do you understand by polarization of light? What are plane of polarization and plane of vibration? Explain polarization (i) by scattering (ii) by reflection.
30. Explain Young's double slit experiment of interference of light waves. Calculate the path difference between interfering waves and give conditions for maxima and minima. . Get the expression for dark and bright fringes

Holiday Home work / Class XII / Mathematics

Relation and Function

1. If A and B are two sets such that $n(A) = m$ and $n(B) = n$ then write number of function from $A \rightarrow B$.
2. Let set A contains 3 elements. Write the total number of binary operation possible.
3. If $f: \mathbb{R} \rightarrow \mathbb{R}$, $a, b, c, d \in \mathbb{R}$ such that $(a, b) * (c, d) = (ac, b + ad)$ Find the identity element of the function.
4. Let * be a binary operation defined by $a * b = 2ab - 7$. Is * associative?
5. Let * be the binary operation on \mathbb{N} defined by $a * b = a + b + 10$ for all $a, b \in \mathbb{N}$ and if $3 * p = 15$ then find p.

6. Let $f(x) = [x]$ and $g(x) = |x|$. Find

i) $(g \circ f)\left(\frac{-5}{3}\right) - (f \circ g)\left(\frac{-5}{3}\right)$ ii) $(g \circ f)\left(\frac{5}{3}\right) - (f \circ g)\left(\frac{5}{3}\right)$ iii) $(f + 2g)(-1)$

1. Show that the relation are in the set $a = \{x : x \in \mathbb{W}, x \leq 10\}$ given by $R = \{(a, b) : |a - b| \text{ is a multiple of } 3\}$ is an equivalence relation, find the elements related to 3.

2. Let $f: \mathbb{R} - \left\{-\frac{3}{5}\right\} \rightarrow \mathbb{R}$ be a function defined as $f(x) = \frac{2x}{5x+3}$, find f^{-1} : Range of $f: \mathbb{R} - \left\{-\frac{3}{5}\right\}$.

3. Let $A = \mathbb{N} \times \mathbb{N}$ and Let * be a binary operation on A defined by $(a, b) * (c, d) = (ad + bc, bd)$ for all $(a, b), (c, d) \in \mathbb{N} \times \mathbb{N}$. Determine if * is commutative, associative,

4. Let $A = \{-1, 0, 1, 2\}$, $B = \{-4, -2, 0, 2\}$ and $f, g: A \rightarrow B$ be the function defined by $f(x) = x^2 - x$, $x \in A$ and $g(x) = 2|x - 1/2|$, $x \in A$; are f and g equal. Justify your answer.

7. is an equivalence relation, find the elements related to 3.

8. Let $f: \mathbb{R} - \left\{-\frac{3}{5}\right\} \rightarrow \mathbb{R}$ be a function defined as $f(x) = \frac{2x}{5x+3}$, find f^{-1} : Range of $f: \mathbb{R} - \left\{-\frac{3}{5}\right\}$.

9. Let $A = \mathbb{N} \times \mathbb{N}$ and Let * be a binary operation on A defined by $(a, b) * (c, d) = (ad + bc, bd)$ for all $(a, b), (c, d) \in \mathbb{N} \times \mathbb{N}$. Determine if * is commutative, associative,

10. Let $A = \{-1, 0, 1, 2\}$, $B = \{-4, -2, 0, 2\}$ and $f, g : A \rightarrow B$ be the function defined by $f(x) = x^2 - x$, $x \in A$ and $g(x) = 2|x - 1/2|$, $x \in A$; are f and g equal. Justify your answer.

Differentiation

11. Differentiate w.r.t x $e^x + e^y = e^{x+y}$

12. Differentiate $y = a^x + x^a + a^a + x^x$ w.r.t. x .

13. Differentiate $y = e^x + e^{x^2} + e^{x^3} + e^{x^4} + e^{x^5}$ w.r.t. x for $x > 0$, $a > 0$.

14. Differentiate $\cos(\log x + e^x)$; $x > 0$ w.r.t. x

15. Find $\frac{dy}{dx}$ if $y = \sec^{-1}\left(\frac{\sqrt{x}+1}{\sqrt{x}-1}\right) + \sin^{-1}\left(\frac{\sqrt{x}-1}{\sqrt{x}+1}\right)$

16. If $y = \cos^{-1}\left(\frac{x-\frac{1}{x}}{x+\frac{1}{x}}\right)$, find $\frac{dy}{dx}$

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

18. If $(x+y)^{m+n} = x^m y^n$ Show that $\frac{dy}{dx} = \frac{y}{x}$

19. If $\sqrt{1-x^6} + \sqrt{1-y^6} = a(x^3 - y^3)$, P.T $\frac{dy}{dx} = \sqrt{\frac{1-y^6}{1-x^6}}$

20. If $y = \sqrt{\cos x + \sqrt{\cos x + \sqrt{\cos x + \dots \infty}}}$ prove that $(2y-1)\frac{dy}{dx} + \sin x = 0$

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

22. Find $\frac{dy}{dx}$ if $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$

23. Find $\frac{dy}{dx}$ if $y = x \log(\log x)$

24. If $\sin y = x \sin(a+y)$, with $\cos a \neq 1$, P.T $\frac{dy}{dx} = \frac{\sin^2(a+y)}{\sin a}$

25. If $y = a \cos(\log x) + b \sin(\log x)$. S.T. $x^2 y_2 + x y_1 + y = 0$.

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

27. If $y = e^{\tan^{-1} x}$, show that $(1+x^2) y_2 + (2x-1) y_1 = 0$.

28. If $y = \sin^{-1} x$, show that $(1-x^2) y_2 - x y_1 = 0$

29. If $y = e^{a \cos^{-1} x}$, $-1 \leq x \leq 1$, show that $(1-x^2) y_2 - x y_1 - a^2 y = 0$.

30. If $y = e^{m \sin^{-1} x}$, show that $(1-x^2)y^2 - xy(1-m^2y) = 0$.

31. If $y = 3e^{2x} + 2e^{3x}$, then prove that $y_2 - 5y_1 + 6y = 0$

$$(1-x^2) \frac{d^2 y}{dx^2} - x \frac{dy}{dx} + y = 0$$

32. If $x = \sin t$, $y = \sin pt$. Show that

33. If $y = \sin(m \sin^{-1} x)$. S.T. $(1-x^2)y^2 - xy(1+m^2y) = 0$.

34. Find the value of a and b so that

$$f(x) = \begin{cases} \frac{x-4}{|x-4|} + a & \text{if } x < 4 \\ a + b & \text{if } x = 4 \\ \frac{x-4}{|x-4|} + 2b & \text{if } x > 4 \end{cases} \quad \text{is a continuous function at } x = 4$$

35. Determine the value of 'a' so that

$$f(x) = \begin{cases} \frac{1-\cos 4x}{x^2}, & \text{if } x < 0 \\ a, & \text{if } x = 0 \\ \frac{\sqrt{x}}{\sqrt{16-\sqrt{x}}-4}, & \text{if } x > 0 \end{cases} \quad \text{is continuous at } x = 0$$

36. If $f(x) = \begin{cases} \frac{k \cos x}{\pi - 2x}, & \text{if } x \neq \frac{\pi}{2} \\ 3, & \text{if } x = \frac{\pi}{2} \end{cases}$ is continuous at $x = \pi/2$

37. Find the value of a and b such that the function defined by

$$f(x) = \begin{cases} x^2 + ax + b & \text{if } 0 \leq x < 2 \\ 3x + 2 & \text{if } 2 \leq x \leq 4 \\ 2ax + 5b & \text{if } 4 < x \leq 8 \end{cases} \quad \text{is continuous on } [0, 8]$$

38. Find a and b so that $f(x) = \begin{cases} x + a\sqrt{2} \sin x, & \text{if } 0 \leq x < \frac{\pi}{4} \\ 2x \cot x + b, & \text{if } \frac{\pi}{4} \leq x < \frac{\pi}{2} \\ a \cos 2x - b \sin x, & \text{if } \frac{\pi}{2} \leq x < \pi \end{cases}$ is continuous on $[0, \pi]$

39. Find a and b so that $f(x) = \begin{cases} \frac{\sin(a+1)x + \sin x}{x}, & x < 0 \\ c, & x = 0 \\ \frac{\sqrt{x+bx^2} - \sqrt{x}}{bx^{\frac{3}{2}}}, & x > 0 \end{cases}$ is continuous at $x = 0$.

40. Find k so that $f(x) = \begin{cases} \frac{2^{x+2} - 16}{4^x - 16}; & x \neq 2 \\ k; & x = 2 \end{cases}$ is continuous at $x = 2$.

41. Show that $f(x) = |1 - x + |x||$, $x \in \mathbb{R}$ is a continuous function.

42. Show that $f(x) = |x - 2|$ is continuous but not differentiable at $x = 2$.

43. Discuss the differentiability of $f(x) = x|x|$ at $x = 0$.

44. Discuss the differentiability of $f(x) = |x - 1| + |x - 2|$

Matrix and Determinants

1. Find x,y,z if

$$\begin{bmatrix} x & 3 & 2 \end{bmatrix} \begin{pmatrix} 2 & 1 & 1 \\ 0 & y & 2 \\ 1 & 2 & z \end{pmatrix} = \begin{bmatrix} 0 & 0 & 1 \end{bmatrix}$$

2. If $A = \begin{pmatrix} 3 & -5 \\ -4 & 2 \end{pmatrix}$ = Show that $A^2 - 5A - 14I = 0$ and hence find A^{-1} .

3. Using properties of determinants solve for x $\begin{vmatrix} a+x & a-x & a-x \\ a-x & a+x & a-x \\ a-x & a-x & a+x \end{vmatrix} = 0$:

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

5. Using properties of determinants, prove that:

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

6. If

$$\begin{bmatrix} \cos a & \sin a \\ -\sin a & \cos a \end{bmatrix}, \text{ prove that } X^n = \begin{bmatrix} \cos na & \sin na \\ -\sin na & \cos na \end{bmatrix}, n \in \mathbb{N}$$

7. Using properties ,prove that:

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

8. If $A = \begin{bmatrix} 3 & -4 \\ 1 & -1 \end{bmatrix}$, Using principle of mathematical induction prove that

$$A^n = \begin{bmatrix} 1+2n & -4n \\ n & 1-2n \end{bmatrix}$$

9. Using properties of determinants, prove that $\begin{bmatrix} \sin \alpha & \cos \alpha & \cos(\alpha + \delta) \\ \sin \beta & \cos \beta & \cos(\beta + \delta) \\ \sin \gamma & \cos \gamma & \cos(\gamma + \delta) \end{bmatrix} = 0$

10. If $A = \begin{bmatrix} 2 & -1 \\ 3 & 4 \end{bmatrix}$, $B = \begin{bmatrix} 5 & 7 \\ 2 & 4 \end{bmatrix}$, $C = \begin{bmatrix} 2 & 5 \\ 3 & 8 \end{bmatrix}$, $A =$, $B =$, $C =$ Find a matrix D such that $CD - AB = 0$.

11. Let $A = \begin{bmatrix} 1 & -2 & 1 \\ -2 & 3 & 1 \\ 1 & 1 & 5 \end{bmatrix}$, Verify that $[Adj A]^{-1} = Adj(A^{-1})$.

12. If $A = \begin{bmatrix} 3 & -2 \\ 4 & -2 \end{bmatrix}$, find k so that $A^{-1} = KA - 2I$.

13. Find X and Y if $3X - Y = \begin{bmatrix} 1 & 1 \\ -1 & 1 \end{bmatrix}$ and $X - 3Y = \begin{bmatrix} 0 & -1 \\ 1 & -1 \end{bmatrix}$.

14. If $I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ Show that $I + A = (I - A) \begin{bmatrix} \cos \alpha & -\sin \alpha \\ \sin \alpha & \cos \alpha \end{bmatrix}$

15. Find B if $\begin{bmatrix} 2 & 5 \\ -3 & 7 \end{bmatrix} B = \begin{bmatrix} 17 & -1 \\ 47 & -13 \end{bmatrix}$

16. Find $A = \begin{bmatrix} 3 & 1 \\ 7 & 5 \end{bmatrix}$, find a and b such that $A^2 + aI = bA$ such that where I is unit matrix of order 2.

17. Express $A = \begin{bmatrix} 6 & 1 \\ 3 & 4 \end{bmatrix}$ as a sum of a symmetric and a skew-symmetric matrix.

18. Prove using properties of determinants

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

$$x + y + z = 3$$

$$x + y + z = 3$$

$$2x - y + z = 2$$

$$x - 2y + 3z = 2$$

19. Solve the equations by matrix method

$$A = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 2 & -3 \\ 2 & -1 & 3 \end{bmatrix}$$

$$x + y + 2z = 0$$

$$x + 2y - z = 9$$

20. If

find and use it solve the system of equations: $x - 3y + 3z = -14$

21. Using determinants, solve the following system of equations:

$$x - y + 3z = 6$$

$$x + 3y - 3z = -4$$

$$5x + 3y + 3z = 10$$

22. Find the value of λ , for which given homogeneous system of equations have non trivial solution. Also find the solution.

$$2x + 3y - 2z = 0$$

$$2x - y + 3z = 0$$

$$7x + \lambda y - z = 0$$

$$A = \begin{bmatrix} 4 & -5 & -11 \\ 1 & -3 & 1 \\ 2 & 3 & -7 \end{bmatrix} \text{ find } A^{-1}$$

23. If

Using A^{-1} solve the system of linear equations:

$$4x - 5y - 11z = 12$$

$$x - 3y + z = 1$$

$$2x + 3y - 7z = 2$$

24. If $A = \begin{bmatrix} 2 & -1 & 1 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 3 & 1 & -1 \\ 1 & 3 & 1 \\ -1 & 1 & 3 \end{bmatrix}$ find the product AB and use this result to solve the following system of equations:

$$\begin{aligned} 2x - y + z &= -1 \\ -x + 2y - z &= 4 \\ x - y + 2z &= -3 \end{aligned}$$

$$\begin{aligned} x - y + z &= 3 \\ 2x + y - z &= 2 \\ -x - 2y + 2z &= 1 \end{aligned}$$

25. Solve using matrices:

26. For what value of a and b , the following system of equations is consistent?

$$\begin{aligned} x + y + z &= 6 \\ 2x + 5y + az &= b \\ x + 2y + 3z &= 14 \end{aligned}$$

Matrices and Determinants (1 Mark questions)

Page 1 of 5

- Find x if $\begin{vmatrix} 3x & 4 \\ 6 & 1 \end{vmatrix} = 0$
- How many matrices of order 3×3 are possible with each entry 0 or 1?
- For any 2×2 matrix, if $A(\text{adj } A) = \begin{bmatrix} 10 & 0 \\ 0 & 10 \end{bmatrix}$, then find $|A|$
- If A is a square matrix of order 3 such that $|\text{adj } A| = 25$ find $|A|$
- If $A = [1 \ 2 \ 3 \ 4]$ and $B = \begin{pmatrix} 1 \\ 2 \\ 3 \\ 4 \end{pmatrix}$ Write the order of AB and BA
- For what value of x , the following matrix is singular?

$$\begin{pmatrix} 7-x & x+2 \\ 5 & 4 \end{pmatrix}$$

- A matrix A of order 3×3 has determinant 7, what is the value of $|3A|$?
- If A is a square matrix such that $A^2 = A$, then find $(I + A)^2 - 3A$.

$$A = \begin{pmatrix} \sin x & \cos x \\ -\cos x & \sin x \end{pmatrix}$$

9. If $A = \begin{pmatrix} \sin x & \cos x \\ -\cos x & \sin x \end{pmatrix}$ find x , $0 < x < \pi$ when $A + A' = I$.

10. If A and B are matrices of the equal order and B is skew symmetric, then show that $A'BA$ is skew symmetric.

11. Using elementary operations, find the inverse of $\begin{bmatrix} 3 & -1 \\ 0 & 2 \end{bmatrix}$

$$A = \begin{pmatrix} 0 & a & b \\ -a & 0 & c \\ -b & -c & 0 \end{pmatrix}$$

12. Show that the matrix $A = \begin{pmatrix} 0 & a & b \\ -a & 0 & c \\ -b & -c & 0 \end{pmatrix}$ is Skew-symmetric.

13. Express the matrix $\begin{bmatrix} 3 & -4 \\ 1 & -1 \end{bmatrix}$ as the sum of symmetric and a skew-symmetric matrix.

14. A matrix of order 3×3 has a determinant 15. What is the value of $|5A|$?

15. If A is square matrix of order 3 such that $|\text{Adj } A| = 289$, find $|A|$.

16. Give an example of two non-zero matrices A and B of the same order 2×2 such that $AB=0$.

$$\begin{bmatrix} k & 1 \\ -3 & 2 \end{bmatrix}$$

17. Find the value of k , if the matrix $\begin{bmatrix} k & 1 \\ -3 & 2 \end{bmatrix}$ is singular.

18. Show that the matrix $B'AB$ is symmetric or skew symmetric according as A is symmetric or skew symmetric.

19. Construct a 2×3 matrix whose elements are given by $a_{ij} = j \log i$

20. If $A = [a_{ij}]_{4 \times 4}$, then $|k.A| = \alpha |A|$ What is the value of α

21. If A is 3×4 matrix and B is a matrix such that $A'B$ and BA' are both defined, then find the order of matrix B .

22. If a square matrix A be singular find the matrix $A (\text{adj } A)$.

23. If A is an invertible matrix of order 2 and $\det(A) = 5$, then find $\det(A^{-1})$.

$$\begin{pmatrix} 1 \\ 2 \\ 3 \end{pmatrix} (2 \ 3 \ 4)$$

24. Evaluate

25. If A and B are symmetric matrices of same order. Prove that $AB-BA$ is skew symmetric matrix.

$$\begin{pmatrix} -2 & k \\ 2k & -16 \end{pmatrix}$$

26. For what value of k , the matrix $\begin{pmatrix} -2 & k \\ 2k & -16 \end{pmatrix}$ is singular.

27. If A and B are symmetric matrices then show that $AB-BA$ will be skew-symmetric.

28. If A be singular matrix, then find the value of 'x' ?

$$A = \begin{bmatrix} x+3 & 2 \\ 5x+1 & 6 \end{bmatrix}$$

29. If $A = \begin{bmatrix} x+3 & 2 \\ 5x+1 & 6 \end{bmatrix}$ and B are two matrices such that $AB=A$ and $BA=B$ then what is value of B^2 .

30. If $\begin{bmatrix} -1 & 3 & 4 \\ 5 & -1 & 2 \end{bmatrix}$ is additive inverse of $\begin{bmatrix} 2x & -3 & y \\ x+t & -z & 2z \end{bmatrix}$. Find x, y, z and t.

31. Construct 3x2 matrix If $A = [a_{ij}]$ where $a_{ij} = \{ i+j, \text{ if } i > j ; i-j, \text{ if } i < j \}$.

$$a_{ij} = \frac{(i+j)^2}{2}$$

32. Construct a 2 x 2 matrix $A = [a_{ij}]$ whose elements are given by

33. If $\begin{bmatrix} a+b & 2 \\ 5 & a+b \end{bmatrix} = \begin{bmatrix} 6 & 2 \\ 5 & 8 \end{bmatrix}$ find the values of a and b.

$$A = \begin{bmatrix} 4 & -3 & 1 \\ -6 & 7 & -4 \\ 1 & -2 & x \end{bmatrix}$$

34. Find value of x, If matrix

35. $\begin{bmatrix} 0 & x+2 & 2-x \\ 1-2x & 0 & 2x-1 \\ 3x-8 & x-8 & 0 \end{bmatrix}$ is a skew symmetric, find value of x.

$$a_{ij} = \frac{(i-j)^2}{2}$$

36. Construct a 2x2 matrix $A = [a_{ij}]$ whose element are given by

$$A (\text{adj } A) = \begin{bmatrix} 10 & 0 \\ 0 & 10 \end{bmatrix}$$

37. For any 2 x 2 matrix, if

38. If A is a square matrix such that $A^2 = A$. Find the value of $(I+A)^3 - 7A$.

$$A = \begin{bmatrix} 2 & -3 & 5 \\ 6 & 0 & 4 \\ 1 & 5 & -7 \end{bmatrix}$$

39. Find the cofactor of (1, 2)th entry in the given matrix

40. If a matrix is both is symmetric and skew symmetric, then show that it is a null matrix.

41. If B is a skew symmetric, write whether the matrix (ABA) is symmetric or skew symmetric.

$$\begin{bmatrix} 0 & 5 & -7 \\ -5 & 0 & 11 \\ 7 & -11 & 0 \end{bmatrix}$$

42. Which type of matrix is this?

Matrices and Determinants (4 Mark questions)

1. If $A = \begin{bmatrix} 1 & 0 \\ -1 & 7 \end{bmatrix}$, find k so that $A^2 = 8A + kI$. Hence find A^{-1} .

2. If a, b, c are in AP, show that $\begin{vmatrix} x+1 & x+2 & x+a \\ x+2 & x+3 & x+b \\ x+3 & x+4 & x+c \end{vmatrix} = 0$.

3. Without using the concept of inverse of a matrix $\begin{bmatrix} x & y \\ z & u \end{bmatrix}$, find the matrix such that

$$\begin{bmatrix} 5 & -7 \\ -2 & 3 \end{bmatrix} \begin{bmatrix} x & y \\ z & u \end{bmatrix} = \begin{bmatrix} -16 & -6 \\ 7 & 2 \end{bmatrix}$$

$$\begin{vmatrix} a & a+b & a+b+c \\ 2a & 3a+2b & 4a+3b+2c \\ 3a & 6a+3b & 10a+6b+3c \end{vmatrix} = a^3.$$

4. By using properties of determinants show that

$$\begin{vmatrix} 3 & -1 & -2 \\ 2 & 0 & -1 \\ 3 & -5 & 0 \end{vmatrix}.$$

5. Using elementary row transformation find the inverse of the matrix

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

6. Prove by using properties of determinant

7. If $A = \begin{bmatrix} 3 & -4 \\ 1 & -1 \end{bmatrix}$, then prove that $A^n = \begin{bmatrix} 1+2n & -4n \\ n & 1-2n \end{bmatrix}$, where n is any positive integer.

8. Using properties of determinants, Prove that

$$\begin{vmatrix} x & x^2 & 1+px^3 \\ y & y^2 & 1+py^3 \\ z & z^2 & 1+pz^3 \end{vmatrix} = (1+pxyz)(x-y)(y-z)(z-x)$$

9. Using the properties of determinants, show that

$$\begin{vmatrix} x & y & x+y \\ y & x+y & x \\ x+y & x & y \end{vmatrix} = -2(x^3+y^3)$$

10. Express the matrix $A = \begin{pmatrix} 1 & 3 & 5 \\ -6 & 8 & 3 \\ -4 & 6 & 5 \end{pmatrix}$ as the sum of symmetric and skew symmetric matrices.

11. Using the properties of determinants; show that

$$\begin{vmatrix} 1 & a & a^2-bc \\ 1 & b & b^2-ca \\ 1 & c & c^2-ab \end{vmatrix} = 0$$

12. For the determinant $\begin{vmatrix} a^2 & (b+c)^2 & bc \\ b^2 & (a+c)^2 & ca \\ c^2 & (b+a)^2 & ab \end{vmatrix}$ Show that (a+b+c) and (a²+b²+c²) are the factors.

13. Show that $A = \begin{pmatrix} -8 & 5 \\ 2 & 4 \end{pmatrix}$ satisfies the equation $x^2 + 4x - 42 = 0$. Hence find A^{-1} .

14. Using the properties of determinants, show that

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

15. If $A = \begin{pmatrix} \cos \theta & \sin \theta \\ -\sin \theta & \cos \theta \end{pmatrix}$ then prove that $A^n = \begin{pmatrix} \cos n\theta & \sin n\theta \\ -\sin n\theta & \cos n\theta \end{pmatrix}$, $n \in \mathbb{N}$

16. Prove that
$$\begin{vmatrix} a^2 + 1 & ab & ac \\ ab & b^2 + 1 & bc \\ ca & cb & c^2 + 1 \end{vmatrix} = 1 + a^2 + b^2 + c^2$$

17. Prove by using properties of determinant
$$\begin{vmatrix} b^2 + c^2 & ab & ac \\ ba & c^2 + a^2 & bc \\ ca & cb & a^2 + b^2 \end{vmatrix} = 4a^2b^2c^2$$

18. If a,b,c are in A.P then find the value of the determinant
$$\begin{vmatrix} x+3 & x+4 & x+5a \\ x+4 & x+5 & x+5b \\ x+5 & x+6 & x+5c \end{vmatrix}$$
.

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

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

20. Show that
$$\begin{vmatrix} (y+z)^2 & xy & zx \\ xy & (x+z)^2 & yz \\ xz & yz & (z+y)^2 \end{vmatrix} = 2xyz(x+y+z)^3$$

21. Using properties of determinants, prove the following

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

22. If a, b, c are positive and unequal, show that value of determinant
$$\begin{vmatrix} a & b & c \\ b & c & a \\ c & a & b \end{vmatrix}$$
 is negative.

23. Find the matrix X and Y when it is being given that

$$X+Y = \begin{pmatrix} -2 & -6 & 8 \\ 2 & 1 & -3 \end{pmatrix} \quad X-Y = \begin{pmatrix} 8 & -2 & 2 \\ -6 & 1 & 3 \end{pmatrix}$$

24. Using properties of determinants, Prove that
$$\begin{vmatrix} a+b+2c & a & b \\ c & b+c+2a & b \\ c & a & c+a+2b \end{vmatrix} = 2(a+b+c)^3$$

25. Using properties of determinants, Prove that
$$\begin{vmatrix} a^2+2a & 2a+1 & 1 \\ 2a+1 & a+2 & 1 \\ 3 & 3 & 1 \end{vmatrix} = (a-1)^3$$

26. Using properties of determinants Prove that

$$\alpha \begin{vmatrix} \beta & r \\ \alpha^2 & \beta^2 & r^2 \\ \beta+r & r+\alpha & \alpha+\beta \end{vmatrix} = (\alpha - \beta) (\beta - r) (r - \alpha) (\alpha + \beta + r)$$

27. If $A = \begin{bmatrix} 2 & 3 \\ 1 & 2 \end{bmatrix}$ and $I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ Find x and y Such that $A^2 = xA + yI$. Hence find A^{-1} .

28. If $A = \begin{bmatrix} 0 & 0 \\ 0 & 1 \end{bmatrix}$ Then by mathematical induction show that $(aI + bA)^n = a^n I + n.a^{n-1}.bA$ Where a & b are constant.

29. If $A = \begin{bmatrix} 0 & -\tan \alpha/2 \\ \tan \alpha/2 & 0 \end{bmatrix}$ and $I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$, then show that $I+A = (I-A) \begin{bmatrix} \cos \alpha & -\sin \alpha \\ \sin \alpha & \cos \alpha \end{bmatrix}$.

30. Prove that $\begin{vmatrix} 1 & x & x^2 \\ x^2 & 1 & x \\ x & x^2 & 1 \end{vmatrix} = (1-x^3)^2$

31. Prove that : $\begin{vmatrix} a+bx & c+dx & p+qx \\ ax+b & cx+d & px+q \\ u & v & w \end{vmatrix} = (1-x^2) \begin{vmatrix} a & c & p \\ b & d & q \\ u & v & w \end{vmatrix}$

32. Using properties of determinants prove that $\begin{vmatrix} 1 & a^2+bc & a^3 \\ 1 & b^2+ca & b^3 \\ 1 & c^2+ab & c^3 \end{vmatrix} = -(a-b)(b-c)(c-a)(a^2+b^2+c^2)$

33. Let $X = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ and $Y = \begin{bmatrix} 0 & 1 \\ 0 & 0 \end{bmatrix}$ show that $(aX + bY)^3 = a^3X + 3a^2b Y$.

34. Prove that value of the determ $\begin{vmatrix} x & \sin \theta & \cos \theta \\ -\sin \theta & -x & 1 \\ \cos \theta & 1 & x \end{vmatrix}$ is independent of .

35. Solve for $\begin{vmatrix} x & -6 & -1 \\ 2 & -3x & x-3 \\ -3 & 2x & x+2 \end{vmatrix} = 0$.

36. Show that $\begin{vmatrix} 1+a & 1 & 1 \\ 1 & 1+b & 1 \\ 1 & 1 & 1+c \end{vmatrix} = abc \left(1 + \frac{1}{a} + \frac{1}{b} + \frac{1}{c} \right) = abc + bc + ca + ab$.

37. By using the properties of the determinants prove that

$$\begin{vmatrix} 1 & 1 & 1 \\ a & b & c \\ a^3 & b^3 & c^3 \end{vmatrix} = (a-b)(b-c)(c-a)(a+b+c)$$

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

$$39. \begin{vmatrix} x & x^2 & yz \\ y & y^2 & zx \\ z & z^2 & xy \end{vmatrix} = (x-y)(y-z)(z-x)(xy+yz+zx)$$

$$40. \begin{vmatrix} x+4 & 2x & 2x \\ 2x & x+4 & 2x \\ 2x & 2x & x+4 \end{vmatrix} = (5x+4)(4-x)^2$$

$$41. \begin{vmatrix} y+k & 1 & 1 \\ y & y+k & y \\ y & y & y \end{vmatrix} = k^2(3y+k)$$

$$42. \begin{vmatrix} 1+a^2-b^2 & 2ab & -2b \\ 2ab & 1-a^2+b^2 & 2a \\ 2b & -2a & 1-a^2-b^2 \end{vmatrix} = (1+a^2+b^2)^3$$

$$43. \begin{vmatrix} a^2 & bc & ac+c^2 \\ a^2+ab & b^2 & ac \\ ab & b^2+bc & c^2 \end{vmatrix} = 4a^2b^2c^2$$

$$44. \begin{vmatrix} \sin \alpha & \cos \alpha & \cos(\alpha+\delta) \\ \sin \beta & \cos \beta & \cos(\beta+\delta) \\ \sin \gamma & \cos \gamma & \cos(\gamma+\delta) \end{vmatrix} = 0$$

$$45. \begin{vmatrix} x+a & b & c \\ a & x+b & c \\ a & b & x+c \end{vmatrix} = x^2(x+a+b+c)$$

$$46. \begin{vmatrix} a & b-c & c-b \\ a-c & b & c-a \\ a-b & b-a & c \end{vmatrix} = (a+b-c)(b+c-a)(c+a-b)$$

$$47. \text{ If } a, b, c \text{ are reals, and } \Delta = \begin{vmatrix} b+c & c+a & a+b \\ c+a & a+b & b+c \\ a+b & b+c & c+a \end{vmatrix} = 0 \quad \text{Show that either } a+b+c=0 \text{ or } a=b=c.$$

Matrices and Determinants (6 Mark questions)

1. Using matrices solve the following equations: $x+y+z=3$; $x-2y+3z=2$ and $2x-y+z=2$

$$A = \begin{bmatrix} 1 & -1 & 0 \\ 2 & 3 & 4 \\ 0 & 1 & 2 \end{bmatrix} \text{ and } B = \begin{bmatrix} 2 & 2 & -4 \\ -4 & 2 & -4 \\ 2 & -1 & 5 \end{bmatrix}$$

2. If $A = \begin{bmatrix} 1 & -1 & 0 \\ 2 & 3 & 4 \\ 0 & 1 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 2 & -4 \\ -4 & 2 & -4 \\ 2 & -1 & 5 \end{bmatrix}$, Find AB hence solve the system of equation $x-y=3$, $2x+3y+4z=17$, $y+2z=7$

3. Solve the following system of equations by matrix method : $5x-7y+z = 11$, $6x-8y-z = 15$ and $3x+2y-6z = 7$.

$$A = \begin{bmatrix} -4 & 4 & 4 \\ -7 & 1 & 3 \\ 5 & -3 & -1 \end{bmatrix} \text{ and } B = \begin{bmatrix} 1 & -1 & 1 \\ 1 & -2 & -2 \\ 2 & 1 & 3 \end{bmatrix}$$

4. Given that find BA. Use product solve the system of equations $x - y + z = 4$, $x - 2y - 2z = 9$, $2x + y + 3z = 1$

5. Solve the following system of equations by matrices: $2/x + 3/y + 10/z = 4$; $6/x + 9/y - 20/z = 2$; $4/x - 5/y + 5/z = 1$

$$A = \begin{bmatrix} 1 & 1 & 2 \\ -1 & -2 & 1 \\ 1 & -2 & 3 \end{bmatrix} \text{ find } A^{-1}$$

6. Given that Hence solve the system of equations: $x - y + z = 4$, $x - 2y - 2z = 9$, $2x + y + 3z = 1$

$$A = \begin{bmatrix} 2 & -3 & 5 \\ 3 & 2 & -4 \\ 1 & 1 & -2 \end{bmatrix}$$

7. If find A^{-1} and solve the following system of equations $2x - 3y + 5z = 11$, $3x + 2y - 4z = -5$, $x + y - 2z = -3$.

$$A = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 2 & -3 \\ 2 & -1 & 3 \end{bmatrix}$$

8. If , find A^{-1} and use it to solve the system of the equations

$$x + y + 2z = 0; \quad x + 2y - z = 9; \quad x - 3y + 3z = -14;$$

$$\begin{bmatrix} 2 & -1 & 3 \\ -5 & 3 & 1 \\ -3 & 2 & 3 \end{bmatrix}$$

9. Using elementary row transformations, find the inverse of

$$A = \begin{bmatrix} 1 & 2 & -3 \\ 2 & 3 & 2 \\ 3 & -3 & -4 \end{bmatrix}$$

10. Find A^{-1} , where . Hence, Solve the system of linear equations: $x + 2y - 3z = -4$, $2x + 3y + 2z = 2$, $3x - 3y - 4z = 11$

$$\begin{aligned} \frac{2}{x} - \frac{3}{y} + \frac{3}{z} &= 10 \\ \frac{1}{x} + \frac{1}{y} + \frac{1}{z} &= 10 \\ \frac{3}{x} - \frac{1}{y} + \frac{2}{z} &= 13 \end{aligned}$$

11. Solve the following system of equation by matrix method

$$A = \begin{bmatrix} 3 & 2 & 1 \\ 4 & -1 & 2 \\ 7 & 3 & -3 \end{bmatrix}$$

12. If - Find A^{-1} and hence solve the system of linear equation: $3x + 4y + 7z = 14$, $2x - y + 3z = 4$, $x + 2y - 3z = 0$.

13. If $A = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix}$ prove that $A^2 - 4A - 5I = 0$, Hence find A^{-1} .

14. If $A = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 2 & -3 \\ 2 & -1 & 3 \end{bmatrix}$, find A^{-1} using elementary row operation.

15. Classify the following system of equations as consistent or inconsistent. If consistent solve it. $x - y + 3z = 6$, $x + 3y - 3z = -4$ and $5x + 3y + 3z = 10$

Inverse Trigonometry

Q. 1. Find the value of the following :

i. $\cos^{-1} \left(-\frac{1}{2} \right)$

ii. $\tan^{-1} 1 + \sec^{-1} 2 + \operatorname{cosec}^{-1}(-2)$

iii. $\cos^{-1} \cos \frac{7\pi}{6}$

Q. 2. Prove That

i. $\cot^{-1} \frac{\sqrt{1+\sin x} + \sqrt{1-\sin x}}{\sqrt{1+\sin x} - \sqrt{1-\sin x}} = \frac{x}{2}$

ii. $\tan^{-1} \frac{\sqrt{1+x} - \sqrt{1-x}}{\sqrt{1+x} + \sqrt{1-x}} = \frac{\pi}{4} - \frac{1}{2} \cos^{-1} x$

iii. $\frac{9\pi}{8} - \frac{9}{4} \sin^{-1} \frac{1}{3} = \frac{9}{4} \sin^{-1} \frac{2\sqrt{2}}{3}$

Q. 3. Solve

i. $2 \tan^{-1} (\cos x) = \tan^{-1} (2 \cos x)$

ii. $\sin^{-1} (1-x) - 2 \sin^{-1} x = \frac{\pi}{2}$

Q. 4. Simplify :

i. $\tan^{-1} \left[2 \cos \left(2 \sin^{-1} \frac{1}{2} \right) \right]$

ii.
$$\tan^{-1} \frac{a \cos x - b \sin x}{b \cos x + a \sin x}$$

If $\cos^{-1} x + \cos^{-1} y + \cos^{-1} z = \pi$,

Q. 5. Prove that $x^2 + y^2 + z^2 = 1$

If $\tan^{-1} x + \tan^{-1} y + \tan^{-1} z = \frac{\pi}{2}$,

Q. 6. Prove that $xy + yz + zx = 1$.

If $\cos^{-1} \frac{x}{a} + \cos^{-1} \frac{y}{b} = \alpha$,

Q. 7. Prove that $\frac{x^2}{a^2} + \frac{y^2}{b^2} - \frac{2xy}{ab} \cos \alpha = \sin^2 \alpha$

If $\sin^{-1} x + \sin^{-1} y + \sin^{-1} z = \pi$,

Q. 8. Prove that $x\sqrt{1-x^2} + y\sqrt{1-y^2} + z\sqrt{1-z^2} = 2xyz$

Physical Education

Class – XII

1. Prepare a report on Training in Sports, Strength, Endurance, Speed and Flexibility.
2. Test and measurement play a vital role in sports and games. Prepare a report on Kraus weber test , AAPHER test , Harvard step test and Rikli and Johns test.
3. Make a list of postural deformities and write their causes, precautions and remedies.
4. Prepare a Project file for Board examination 2017-18.
5. Perform 10 yoga asanas and 10 skills of your game chosen from Board examination point of view.

SUMMER HOME ASSIGNMENT-2017
SUBJECT-HINDUSTANI MUSIC (PER) INSTRUMENTAL

S.NO	CLASS	PROJECT
1.	XI (5 th &6 th subject)	Description of North Indian & South Indian Percussion Instruments
2.	XII (5 TH &6 th subject)	Origin of Tabla Or Pakhawaj

SUMMER HOME ASSIGNMENT-2017
SUBJECT-FINE ART (CODE No-049)

S.NO.	CLASS	ASSIGNMENT
1.	XI(5 TH &6 TH Sub)	Landscape painting
2.	XII(5 th &6 th Sub)	Landscape painting -2