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Holidays' Assignments for Summer Vacations (2019-20) for Class XII (Commerce)

General Instructions:

1. *Get up early in the morning and go out for a walk daily. Play some outdoor game to remain fit.*
2. *Learn all the prayers and mantras given in student diary.*
3. *Raise a small kitchen garden by planting seeds.*
4. *The summer break for Nursery to XII will be from May 24, 2019 to July 1, 2019 (Both days inclusive). School will reopen on July 2, 2019.*
5. *Revise the syllabus of all subjects done before summer vacations for Unit Tests to be arranged after summer break.*
6.   *Submit home work to your teachers on July 2, 2019.*
7. *Register & Participate in 1ˢᵗ stage of 5ᵗʰ Online International Humanity Olympiad by accessing through our web portal – www.humanityolympiad.org or Android App - Awake Humanity (play store). Every individual passing the exam (i.e. scoring minimum 40%) will get an e-certificate through e-mail immediately on their emails. School code is : FATE001*

English

1) **REVISE syllabus for U.T.:-**

Flamingo- Lessons- 1 to 5, Poems- 1 & 2

Advertisements, Notice, Invitation & Replies and Letter Writing

Note Making & Summarizing

2) Write 30 new words along with the synonym, antonym and usage of the word.
3) (i) Make a beautiful collage on classified advertisements(any 8)   ---------Roll Nos. 1 to 10
(ii) Make a beautiful collage on different posters (any 8)   --------- Roll Nos. 11 to 20
(iii) Draft beautiful invitations (formal& informal both) on any family Function, School   Function, Inauguration and a Birthday Party.   ------------ Roll Nos. 21 to 30
(iv)Write any 8 notices on A4 sheets.   ------------Roll Nos. 31 onwards
4) Complete Modules from Devjyoti Bravia in good Handwriting.(Use Pencil)
a. Booklet- 1   Worksheet 1 to 8 (Reading Comprehension)
b. Booklet- 1   Worksheet 19 to 23 (Note-Making)
c. Booklet- 2 Worksheet 29,30,33,34,39 to 42, 44 to 47,53,54,60,61, 68 to 70,73,74, 82 to 84
d. Booklet- 3 Worksheet 88 to 93,97,98
e. ASL- Listening Assignment- 1 to 3,
5) Read any motivational book and write its review in 150-200 words.
6) Visit the following links, watch the videos and practice the same for ASL:
https://www.youtube.com/watch?v=1Dax90QyXgI
https://www.youtube.com/watch?v=TdtUjWb0O9w
https://www.youtube.com/watch?v=3LoTF_B8vrU
https://www.youtube.com/watch?v=7kRQlYSqw_g

BUSINESS STUDIES

(A) Revise the syllabus for July Unit Test

(B) Answer the following questions in your Business Studies Note book -:

1.   Chili –out Private Ltd is a company engaged in the business of manufacturing beverages. In the month of March, Shyam, The manager of Chill-Out pvt Ltd plans to bring out a new drink for summer season. He

distributed free samples of new launch and got the feedback from the customers. The feedback report clearly indicated that customers have preferences for mango flavor over strawberry flavor and Jamun flavor over imli. Accordingly, the production was adjusted and the marketing department prepared their promotional and advertising campaigns. As per the sale performance report, Shyam further modified his production plans. Identify and explain the concept of management highlighted in the present case.

State the characteristics of the concept identified in the above para.

2. " In an organisation, the objective of marketing department is to increase sales by 10% by offering discounts .However the finance department is reluctant to offer discount as it means loss of revenue." One of the importance of coordination help to resolve this conflict. Identify and explain it.

3. Mr Suksham Khan is the CEO of "perfect shoes ltd." Before joining this company, he used to work as Management Expert. The peculiarity of Mr Khan is that he observes very minutely every small or big activity. Likewise, he gives equal importance to what is said y every junior or senior person. He is not satisfied with the performance of production department. This department discharges the functions of both production and stock. Both the activities of the department are in a state of chaos. Mr Khan took personal interest to scrutinize the dismal state of affair. He found that shoes of several sizes were made. Some of the sizes were not needed. As a consequence, there was wastage of material, machines and manpower. It was the biggest weakness of the department. During the survey of production department, Mr Khan also noticed that many persons while doing work were making certain movements that were least needed. It slowed down the pace of production. Mr Khan was an experienced management expert. He knows that to utilize the cent-percent production capacity of the employees they need be provided healthy and clean environment. He therefore, paid special attention to this aspect. Besides, he believes that whether male or female, they must be given equal facilities, equal rights and equal opportunities for promotion.

a)   By which technique of scientific management wastages occurring in production department can be prevented?

b)   Highlight the technique of scientific used to enhance the pace of work in production department.

c)   Which principle of management is being followed here? Quote the lines.

4   It is heartening that the implementation of compliance requirements of the Companies Act, 2013 has progressed substantially with NIFTY 500 companies. Data shows a significant increase in women's participation in the top management of Indian Companies from 5% few years ago to 13% now. Even companies which are not in NIFTY 500 have undertaken drives to increase women's participation across different areas of work. The government had also announced that it would support such companies.

Identify and explain the dimensions of business environment discussed above which brought about the change.

5   Government of India has permitted to allow oil marketing public sector undertakings to fix their own prices for Diesel and Petrol. Which concept is the reason for this change in government policy? Explain

6   Mr. Subhash, Mr. Chander and Mr. Bose are the production managers of three different manufacturing firms. They follow different strategies to manage production. Mr. Subhash is able to achieve the target production of 5,000 units within the prescribed period. However, to achieve the target on time, additional Rs.40,000 were paid as overtime wages to employees. Mr. Chander's main consideration is cost cutting. So, he concentrates more on producing goods with fewer resources. He is unable to achieve target production. Mr. Bose uses minimum resources to achieve target production and is also able to produce goods is at lower cost.

(a) In the above case, two important aspects of management have been highlighted, which are alike two sides of the same coin. Identify those two aspects.

(b) Which production manager(s) reflect good management?

7   Management of XYZ Ltd. fulfils all its objectives and the organisation is able to work effectively and efficiently. It decided to donate 2% of its sales to 'Child Right and You (CRY) for improving the conditions of

children in India, This initiative by the company was highly appreciated by the public and their sales increased by 10%. Identify and explain the objective depicted in the given case.

8 Management of XYZ Ltd. fulfils all its objectives and the organisation is able to work effectively and efficiently. XYZ Ltd. had the following personnel in its management team:

Mr. Ram is responsible for framing plans and policies bf XYZ Ltd.

Mr. Joy, Mr. Singh, Miss Priya are responsible for implementation of plans and policies developed by Mr. Ram. Mr. Mohan, Mr. James and Mr. Harish are direct contact with the workforce consisting of various employees and workers.

XYZ Ltd. also provides employment opportunities to the disadvantaged sections of the society.

It was also decided that the remuneration payable to the disadvantaged sections of the society should be fair to both employees and the employer.

a) State the three levels of management and the name the persons who are involved in it.

b) Which level of management is responsible for formulation of short-term departmental objectives in accordance with organisational objectives?

9 Smart Corporation imports various mobile parts from China and assembles them to make a complete mobile. The total work involves three different tasks: assembling, labeling and packing of a mobile. Each employee of the company independently performs all the three tasks. As a result, no employee is able to gain specialisation in a particular field and the company is unable to fulfill the orders on time.

(a) Which principle of Fayol should be followed by Smart Corporation to overcome this problem?

(b) Will the use of this principle enable the employees to gain specialisation?

(c) Can the company implement this principle in managerial work also?

10 Anu works as a secretary to the managing director of Philip Corporation (Research and Development company). Her boss has given the duty to acquire test reports from the laboratory. However, she was unable to fulfill the assigned task as only the technicians, researchers and top executives were allowed to enter and collect the test reports.

(a) Which principle of Fayol is not applied here?

(b) What should have been done so that Anu could have completed her assigned task?

11 Madam always comes 1hour late in the office and leaves 1/2 an hour before the scheduled time. No penal action is taken against him. Other employees also started coming late in the office. Management is very disturbed with this and has started scolding the employees.

(a) Identify the management principle violated in the given case.

(b) Mention any one consequence of not following this principle?

12 Mr. Ajay is the production foreman of smart Kids Private Ltd. (Kids wear manufacturing company). He gets instructions from Mr. Abhi (Production manager) to increase the production due to over purchase of cloth. On the other hand, Mr. Sunder Ram (Sales Manager) orders Mr. Ajay to slow down the production due to unpredictable trend of market demand.

(a) Which principle of management is being ignored in the given case?

(b) What can be the possible consequences of such a violation?

(c) What should be done by Mr. Abhi and Mr. Sunder Ram to resolve the issue?

13 M/s Rapid Cool Industries (AC manufacturing company) asked its employees to work overtime in order to meet growing demand of AC in the summer season. However, the employees were not paid overtime wages for extra time put in by them. As a result, the employees always felt dissatisfied and it led to an unhealthy relationship between the employees and management.

(a) Which principle of management is being overlooked in the given case?

(b) What can be the possible consequences of such a violation?

14 Mr Rahul Chopra, General Manager of IWs Monarch Corporation (Leather bags manufacturing company) retains complete authority over all the activities of the business. No decision-making power is given to the subordinates. As a result, Mr Rahul Chopra is always engaged in day-to-day operational activities and is unable to concentrate on core issues of the company.

    (a) Identify and state the management principle overlooked by Mr Rahul Chopra?

    (b) What should have been done by Mr Rahul Chopra to concentrate more on core issues of   the company?

15 Namita and Aslam completed their MBA and started working in a multinational company at the same level. Both are working hard and are happy with their employees. Aslam had the habit of backbiting and wrong reporting about his colleagues to impress his boss. All the employees in the organisation knew about it. At the time of performance appraisal the performance of Namita was judged better than Aslam. Even then their boss, Saleem Khan decided to promote Aslam stating that being a female Namita will not be able to handle the complications of a higher post.

(d) Identify and explain the principle of management which was not followed by this multinational company.

16   Craft Industries has adopted a new policy of cost cutting. Instead of appointing employees on permanent basis, it has started recruiting them as 'trainees' on temporary basis in order to avoid increment benefits. It immensely benefitted the company in financial terms. However, within one month, the trainees started leaving the company due to feeling of job insecurity. As a result, financial saving made by the company were spent in the process of new recruitment.

    (a) Which principle was not observed by Craft Industries?

    (b) Whether company should continue with the temporary job offer in its new recruitment process? To support your answer, mention any two adverse effects, which a company will face in case of frequent turnover of employees?

17   Ram Kishan is the owner of shoe manufacturing factory. He fixes the standard time of work as per traditional methods. He could not match the supply with the demand for shoes produced in his factory. His son Gangadhar MBA from Lovely Professional University joined business and introduced scientific method and wages of production. As a result output increased drastically. He decided to start a campaign to create awareness among people for developing clean surroundings in their area. He formed a team of 10 members to list the different ways for cleaning the surroundings.

    (a) Which principle of scientific management of Taylor is to be considered in above case?

    (b) What does it state?

18   In order to ensure unity of command, Mr. Rajkumar, the factory manager of M/s Play Kids Pvt. Ltd. (Toys Manufacturing Company), appointed just one foreman (Mr.Suryavanshi) for entire production, planning, implementation and control of a workman. However Mr Suryavanshi was not competent enough to effectively supervise both planning and executing functions. It reduced the quality of work and efficiency of workman.

    (a)Which technique to scientific management is violated in the given case?

    (b) What steps can be taken by Mr Rajkumar to improve the quality of work and efficiency   of workman?

    (c) This technique is an extension to one of the Fayol's principle? Identify the principle.

    (d) What should he do to handle the situation?

19 Mohan Lal and his co-workers are employed by crest Industry. All the workers keep on working from 8:00 AM to 9:00 PM, without any break in between continuous work has reduced the production level. Management is very worried as the demand of the product is rising and production level is not satisfactory in spite of having required workforce. Keeping this in view, the management decided to appoint Mr Ajhar, M.B.A. from IIM

Ahmdabad. He analysed the work which involved heavy manual labour. He allowed small pauses to the workers so that they could recharge their energy for optimum contribution. He also conducted a detailed analysis on the environment in which the business exists and thus he used to change the goals, plans, policies according to the needs of the environment. Name the technique of scientific management adopted by Mr Ajhar.

20   The Directors of a leading book publishing company, identifying the importance of 'value based questions' in CBSE curriculum as an early opportunity published a book based on these type of questions. The book became very popular as no other book had these type of questions The turnover of the company increased tremendously and it decided to provide fair wages to employees to ensure at least a reasonable standard of living. Seeing the demand few book-sellers started charging more price than that was printed on the book.
Identify and explain the 'significance of understanding business environment' highlighted above.

21   Mr Ajay after completing MBA from U.S.A. comes India to start a new business under the banner Ecom Creations Ltd. He launches a new product in e-learning for Senior Secondary School students in commerce stream, which already has an established market in U.K and U.S.A. but not in India. His business starts flourishing in India. Now, more Indian companies entered into the market with different other subjects also.

Identify and quote the lines from above para which highlight significance of understanding business environment.

22   Ace Tours Ltd. is a travel agency which books rail tickets on commission basis. It takes two days for the Race Tours to get the tickets from Railway Reservation counter and deliver the tickets to the
consumers. In the last one year, there has been drastic decrease in its business as must of the consumers have shifted to Shreya Tour and Travels (another Travel Agency), which provides the ticket within ½ hour through use of internet.
(a) Which component of business environment is being overlooked by Race Tours   Ltd.?
(b) Why is it necessary for the business enterprises to lay emphasis to this dimension of
business environment?
(c)Identify the feature of business environment highlighted in the following statement.   'Change   of booking of rail tickets from Railway Reservation Counter to Internet'.

23   XYZ Ltd. has to develop organisational plans for the upcoming year in such a manner that weaker section of the society can be given job opportunities and society can be provided with pollution free environment. For this purpose, it has hired a leading consultancy firm, ABC Ltd. ABC Ltd. had delegated the authority even to the lower levels of management so that an initiative can be developed among employees and growth can be facilitated. A lot of money is being incurred on their fee and collection of facts. Which limitation of planning is being referred above?

24   Naman, working as supervisor in Rainbow Ltd' is given a target of producing 100 shirts a day. Due to his habit of doing thing differently, an idea struck him which would not only give job opportunities to the weaker section of the society but also help in reducing per unit cost and increasing the production per day. Naman also decided that after giving job opportunities he would also transfer authority from a superior to a subordinate as the superior cannot perform all the functions on his own. However, Hari Singh, the Production Manager, does not give any importance to Naman's creativity and hence does not allow Naman to deviate from the pre-decided methods and techniques.
(a) By not allowing Naman from deviating from the pre-decided methods and techniques, Mr.Hari Singh gave rise to one of the limitations of management function. Identify the management function and the limitation.

25   Peter runs a factory wherein he manufactures leather shoes. The business doing well and he intends to expand by diversifying into leather jackets as well as leather bags. The whole organisation is may be grouped into different departments. All the activities related to purchases arc grouped under purchase department like purchase of raw-materials, purchase of inputs and tools etc. Similarly, activities related to marketing include sales department advertising department etc.

(a) Identify the management function being highlighted in the above case.

(b) Which type of structure is followed by Peter?

(c) State any two advantages of above referred organizational structure.

(d) For which types of organisation this form of organizational structure is suitable?

26 Alex Ltd. is manufacturing computers. The business has been doing well and he intends to expand the business by diversifying into handicrafts and shoes, thereby keeping his company growing. Now, for the proper organisation, he adopts an organisational structure in which various divisions are created on the basis of products. Each division or department looks after production, Finance, purchase, sales etc. of one product line.

(a) Identify the management function highlighted above.

(b) Which type of structure is followed by Alex Ltd?

(c) List any two demerits of above referred organizational structure.

(d) For which type of organisation this form of organizational structure is suitable?

27 A company was manufacturing washing machines. There was a well defined System of jobs with a clear and definite authority, responsibility and accountability in the company. But people are not allowed to interact beyond their officially defined roles. As a result the company is not able to adopt the changing business environment. The workforce is also not motivated due to lack of social interaction. The company is facing problems of procedural delays and inadequate recognition to creative talents.

(a) Suggest how the organization overcome the problems faced by it.

(b) Give any two benefits it will derive from your suggestion.

28 The manager of M/s Status industries is overburdened with routine work and is unable to concentrate on core issues of the company. To overcome this problem, he entrusted some of his responsibility and authority to his immediate subordinate to share some of this routine work.

(a) Which concept/process is used by the manager?

(b) It is an extension to one of the principles of management, Name the Principle.

(c) Is manager liable if the subordinate is unable to complete the task according within time?

29 Mrs. Chakarborty a school principal sent out on office order stating that each floor will have a staffroom exclusively for teachers teaching on that floor. No teacher will be allowed to sit in another staffroom. During school hours, teachers can only meet teachers of their department that too for business purpose. She wants each teacher to strictly work as per rules and directions issued by her:

a. Identify the type of organization is this.

b. What might be the aim of school principal for issuing such an office order?

30 A company manufacturing sewing machines setup in 1945 by the British promoters follows formal organization culture in totality. It is facing lot of problems in delays in decision-making. As the result it is not able to adapt to changing business environment. The workface is also not motivated since they cannot vent their grievances except through formal channels, which involve red tape. Employee turnover is high, its market share is also declining due to changed circumstances and business environment.

a. You are to advise the company with regard to change it should bring about in its organization structure to overcome the problems faced by it.

b. Give reason in terms of benefits it will derive from the changes suggested by you.

c. In which sectors can the company diversify keeping in mind the declining market for the product the company is manufacturing?

(C) Prepare "Business Studies Project" for final Exam (Select any one)

Project Details:-

1. **Business Environment -A study of emerging changes in social life with special reference to changing role of today's woman.**

   Introduction,Preface,,Acknowledgement,Certificate,Contents ,Changing role of women—an introduction,Shifting from the concept of joint family to nuclear family,Factors responsible for nuclear families,Dual role of woman,Technological advancement,Suggestions,Bibliography

2. **ANTI PLASTIC CAMPAIGN- With special reference to " Business Environment"**

Introduction,Preface,Acknowledgement,Certificate,Contents ,Introduction of the topic,Anti Plastic campaign,Anti Plastic law in India,Evils Associated with use of plastic,What is being done for success of this campaign,Effect of this campaign on Business - Positive &Negative,Conclusion,Suggestions,Bibliography

Accountancy

(A) Solve all the additional unsolved questions of the following chapters in your Accountancy Note book--:
Accounting for Partnership firms-Fundamentals, Change in Profit sharing Ratio among existing partner & Admission of Partner.

(B) Prepare "Accountancy Project" for final Exam
Hint--:

- Front Page, Preface, Acknowledgement, Certificate, Index
- Introduction to Accounting (Definition of Accounting , Characteristics & Objectives, concept of accounting standards, Name of accounting standards, Accounting cycle)
- Comprehensive Problem- only One(firstly write statement then give solution)
- Specific Problem – On Segment Analysis (firstly write statement then give solution)

(c) Revise the syllabus for July Unit Test

Economics

1. Learn 1 to 10 chapters of Indian Economic Development and complete the given assignments.
2. Prepare an assignment booklet containing 20 very short answer type questions. These questions may be MCQs, true-false, fill ups, one word answer type , definitions, match the column etc.
3. Prepare a report on the highlights of union budget for the financial year 2019-20.
4. Compare Indian economy with China and Pakistan on the following aspects- (i)HDI(ii) GDP growth rate(iii) Life expectancy(iv) Literacy rate(v) Population growth rate (vi)Demographic profile (vii) Occupational structure(viii) Volume of export and import (ix)Sex ratio (x)Foreign Direct Investment
5. **Write short note on the following policies by explaining their objectives and likely impact on Indian economic development:** a) Make in India campaign. (b) Free Education campaign. (c)Clean India mission (d) Jan Dhan Yojna. (e) Crop Insurance Policy. (f) Skill India Mission. (g) Gold Monetization Scheme (h) Special Economic Zones. (I) MNREGA---2005. (j) Mission Inderdhanush. (k) Odd even policy of Delhi Government.(l) GST Policy . (m) National Health Insurance (n) New MSP Policy (o) Demonetization (p) Ayushman yojna (q) Mudra Bank (r)SHG's/ Micro saver .
6. Read the book *Vision-2020* written by Dr. A.P.J. Abdul Kalam and write its summary in 400-500 words.
7. Explain the relevance of **One Child Policy** of China in Indian context (400-500 words)

Physical Education

1. Make a chart on following topics using A3 sheets or make a PPT on following topics.
    a) Asanas to cure 'Diabetes'   :   XII Arts
    b) Asanas to cure 'Asthma'   :   XII Commerce
    c) Asanas to cure 'Hypertension'   :   XII Science
2. Calculate your BMI & Waist Hip Ratio and mention it on last page of your file.

Music

1. Make a chart/collage showing character sketch of Ustad Inayat Khan.
2. Make a PPT on single and double of Tala 'Rupak' & 'Jhap' and insert music related to these talas in your slides

Maths

Note : (i) Do all the assignments in holidays' Homework Notebook.
(ii) Prepare yourself for Unit Test (Ch.1-Ch.5)
(iii) Draw the graphs of inverse trigonometric function and compare it with trigonometric functions

ASSIGNMENT
(MATRICES & DETERMINANTS)

Q.No.	Sums	Answer
1	If $X + Y = \begin{bmatrix} 7 & 0 \\ 2 & 5 \end{bmatrix}$ and $X - Y = \begin{bmatrix} 3 & 0 \\ 0 & 3 \end{bmatrix}$ then the sum of the elements of the matrix $3X - 4Y$ is…………	14
2	If $\begin{bmatrix} x+3 & z+4 & 2y-7 \\ 4x+6 & a-1 & 0 \\ b-3 & 3b & z+2c \end{bmatrix} = \begin{bmatrix} 0 & 6 & 3y-2 \\ 2x & -3 & 2c+2 \\ 2b+4 & -21 & 0 \end{bmatrix}$ then the value of $a + b + c + x + y + z$ is ……….	-16
3	The matrix X is equal to what such th at $3A - 2B + X = 0$, where $A = \begin{bmatrix} 4 & 2 \\ 1 & 3 \end{bmatrix}$; $B = \begin{bmatrix} -2 & 1 \\ 3 & 2 \end{bmatrix}$ …	$\begin{bmatrix} -16 & -4 \\ 3 & -5 \end{bmatrix}$
4	If $A = \begin{bmatrix} \alpha & 0 \\ 1 & 1 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 0 \\ 5 & 1 \end{bmatrix}$, whenever $A^2 = B$, then find the value of α	no real value of α
5	If $A = \text{diag}\begin{bmatrix} d_1, d_2, d_3 \end{bmatrix}$, then find A^n.	diag $\begin{bmatrix} d_1^n, d_2^n, d_3^n \end{bmatrix}$
6	If $A = \begin{bmatrix} 2 & 1 & 3 \\ 4 & 1 & 0 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & -1 \\ 0 & 2 \\ 5 & 0 \end{bmatrix}$, verify that $(AB)' = B'A'$	
7	Let B and C be two square matrices such that $BC = CB$ and $C^2 = 0$. If $A = B+C$, then show that $A^3 - B^3 - 3B^2C$ is equal to 0 .	
8	Show that $\begin{bmatrix} 1 & -\tan\dfrac{\theta}{2} \\ \tan\dfrac{\theta}{2} & 1 \end{bmatrix}\begin{bmatrix} 1 & \tan\dfrac{\theta}{2} \\ -\tan\dfrac{\theta}{2} & 1 \end{bmatrix}^{-1} = \begin{bmatrix} \cos\theta & -\sin\theta \\ \sin\theta & \cos\theta \end{bmatrix}$	
9	If $F(\alpha) = \begin{bmatrix} \cos\alpha & -\sin\alpha & 0 \\ \sin\alpha & \cos\alpha & 0 \\ 0 & 0 & 1 \end{bmatrix}$, and $G(\theta) = \begin{bmatrix} \cos\theta & 0 & \sin\theta \\ 0 & 1 & 0 \\ -\sin\theta & 0 & \cos\theta \end{bmatrix}$, show that $[F(\alpha)G(\theta)]^{-1} = G(-\theta)F(-\alpha)$	

10	Show that $-(a+b+c)$ is one root of the equation $\begin{vmatrix} x+a & b & c \\ b & x+c & b \\ c & a & x+b \end{vmatrix} = 0$ and solve the equation completely.	
11	Using properties of determinates, prove that (i) $\begin{vmatrix} 1 & x & x+1 \\ 2x & x(x-1) & x(x+1) \\ 3x(1-x) & x(x-1)(x-2) & x(x+1)(x-1) \end{vmatrix} = 6x^2(1-x^2)$ (ii) $\begin{vmatrix} b+c & a & a \\ b & c+a & b \\ c & c & a+b \end{vmatrix} = 4abc$ (iii) $\begin{vmatrix} a+bx^2 & c+dx^2 & p+qx^2 \\ ax^2+b & cx^2+d & px^2+q \\ u & v & w \end{vmatrix} = (x^4-1)\begin{vmatrix} b & d & q \\ a & c & p \\ u & v & w \end{vmatrix}$ (iv) $\begin{vmatrix} b+c & a & a \\ b & c+a & b \\ c & c & a+b \end{vmatrix} = 4abc$ (v) $\begin{vmatrix} a+b+2c & a & b \\ c & b+c+2a & b \\ c & a & c+a+2b \end{vmatrix} = 2(a+b+c)^3$	
12	Using properties determinants, solve the following for x: $\begin{vmatrix} x+2 & x+6 & x-1 \\ x+6 & x-1 & x+2 \\ x-1 & x+2 & x+6 \end{vmatrix} = 0$	(-7/3)
13	If $a+b+c \neq 0$ and $\begin{vmatrix} a & b & c \\ b & c & a \\ c & a & b \end{vmatrix}$ then Using properties of determinants prove that $a = b = c$	
14	Solve the following system of equations (i) $x + 2y - 3z = -4$, $2x + 3y + 2z = 2$, $3x - 3y - 4z = 11$. Ans 3.-2 ,1 (ii) $2x - y + 3z = 5$, $3x + 2y - z = 7$, $4x + 5y - 5z = 9$ Ans. $x = \dfrac{34-10k}{14}$, $y = \dfrac{1-11k}{-7}$, $z = k$	
15	Solve by matrix method: $\dfrac{2}{x} - \dfrac{3}{y} + \dfrac{3}{z} = 10$ $\dfrac{1}{x} + \dfrac{1}{y} + \dfrac{1}{z} = 10$ $\dfrac{3}{x} - \dfrac{1}{y} + \dfrac{2}{z} = 13$	
16	Determine the product $\begin{bmatrix} -4 & 4 & 4 \\ -7 & 1 & 3 \\ 5 & -3 & -1 \end{bmatrix}\begin{bmatrix} 1 & -1 & 1 \\ 1 & -2 & -2 \\ 2 & 1 & 3 \end{bmatrix}$ and use it to solve $x-y+z = 4$, $x-2y-2z = 9$, $2x+y+3z = 1$	

| 17 | If $f(x) = ax^2 + bx + c$ is a quadratic function such that $f(1) = 8$, $f(2) = 11$ and $f(-3) = 6$, find $f(x)$ by using matrices. Also find $f(0)$ | |

INVERSE TRIGONOMETRY

1	Evaluate : (i) $\sin^{-1}(\sin \pi/4)$ (ii) $\tan^{-1}(\tan(-6))$ (iii) $\sin\{\pi/2 - \sin^{-1}(1/2)\}$ $$(iv)\cos\left\{\cos^{-1}\left(-\frac{\sqrt{3}}{2}\right) + \frac{\pi}{6}\right\} \qquad (v)\ \sin(\cot^{-1} x) \qquad (vi)\ \cos(\tan^{-1}(3/4))$$ Ans (i) $\pi/4$ (ii) -6 (iii)$\frac{\sqrt{3}}{2}$ (iv) -1 (v) $\frac{1}{\sqrt{1+x^2}}$ (vi) 4/5	
2	(i) If $\tan^{-1} x = \sin^{-1}\left(\frac{1}{2}\right)$, find the value of x. (ii) If $\tan^{-1} x = \frac{\pi}{4} - \tan^{-1}\left(\frac{1}{3}\right)$, then x is ………… ½ (iii) If $\cos^{-1} x = \tan^{-1} x$, then $\sin(\cos^{-1} x) = $ ………… $\frac{\sqrt{5}-1}{2}$ (iv) If $\tan^{-1} 2, \tan^{-1} 3$ are two angles of a triangle, then find the third angle. 3π/4	
3	Solve: (i) $\sin^{-1}[\cos(\sin^{-1}\frac{\sqrt{3}}{2})]$ (ii) $\sin[2\cot^{-1}(\frac{-5}{12})]$ (iii) $\cos[\sin^{-1}\frac{1}{4} + \sec^{-1}\frac{4}{3}]$ (iv) $\sec(\tan^{-1}\frac{y}{2})$ (v) $2(\tan^{-1} 1 + \tan^{-1} 2 + \tan^{-1} 3)$. Ans. (i) π/6 (ii) -120/169 (iii) $\frac{3\sqrt{15}}{16} - \frac{\sqrt{7}}{16}$ $(iv) \frac{\sqrt{4+y^2}}{2}$.	
4	Prove that (i) $\sec^2(\tan^{-1} 2) + \csc^2(\cot^{-1} 3) = 15$. (ii) $2\sin^{-1}\frac{3}{5} - \tan^{-1}\frac{17}{31} = \pi/4$ (iii) $\cot^{-1} 7 + \cot^{-1} 8 + \cot^{-1} 18 = \cot^{-1} 3$ (iv) $\sin\left(2\tan^{-1}\frac{1}{3}\right) + \cos(\tan^{-1} 2\sqrt{2}) = \frac{14}{15}$.	
5	Solve the equation: (i) $\sin^{-1} 6x + \sin^{-1} 6\sqrt{3}x = -\frac{\pi}{2}$ (ii) $\sin^{-1} x + \sin^{-1}(1-x) = \cos^{-1} x$ Ans.(i) x= ±1/12 (ii) x= 0 or ½	
6	If $\tan^{-1}\left(\frac{x-5}{x-6}\right) + \tan^{-1}\left(\frac{x+5}{x+6}\right) = \frac{\pi}{4}$, then find the value of x.	

RELATION & FUNCTIONS

1	Check the following functions for one-one and onto. (a) $f: R \to R, f(x) = \frac{2x-3}{7}$ **Bijective** (b) $f: R \to R, f(x) = |x+1|$ (**neither 1-1 nor onto**) (c) $f: R - \{2\} \to R, f(x) = \frac{3x-1}{x-2}$ (1–1 but onto) (d) $f: R \to [-1, 1], f(x) = \sin^2 x$ (**neither 1-1 nor onto**)	
2	Show that $f: R+ \to R+$ defined by $f(x) = \frac{1}{2x}$ is bijective where $R+$ is the set of all non-zero positive real numbers.	
3	$f: R \to R, g: R \to R$ given by $f(x) = [x], g(x) = |x|$ then find $(fog)\left(\frac{-2}{3}\right)$ and $(gof)\left(\frac{-2}{3}\right)$	0 ;1
4	let A be the set of all students of class XII in a school and R be the relation, having the same sex	

	on A, and then prove that R is an equivalence relation	
5	Show that the relation R defined by $(a, b) R(c, d) \Leftrightarrow a + d = b + c$ on the set $N \times N$ is an equivalence relation.	
6	Let N be the set of all natural numbers & R be the relation on $N \times N$ defined by $(a, b) R (c, d)$ if $ad(b+c) = bc(a + d)$. Show that R is an equivalence relation.	
7	Show that the relation R in the set A $= \{5,6,7,8,9\}$ given by $R = \{(a,b): |a - b| \text{ is divisible by } 2\}$, is an equivalence relation. find all the elements related to elements 6.	
8	Let $f : N \to N$ be a function defined by $f(x) = 9x^2 + 6x - 5$. Show that $f : N \to S$, where S is the range of f, is invertible. Find the inverse of f. Hence find (i) $f^{-1}(43)$ (ii) $f^{-1}(163)$ Ans. $f^{-1}(x) = \dfrac{\sqrt{x+6}-1}{3}$, (i) 2 (ii) 4	
9	If $f: R^+ \to R$ be a function defined as $f(x) = x^2 + 4x + 6$. Show that f is one one but not onto. Find the range of S of f .Also show that f: $R^+ \to S$ defined by $f(x) = x^2 + 4x + 6$ is invertible. Now find f^{-1}	
10	**If** $f : R \to R$ **and** $g : R \to R$ defined as $f(x) = |x| + x$ and $g(x) = |x| - x$,Then , find fog and gof . hence , find fog(-3) , fog(5) and gof(-2) . ans ||x|-x| +|x| -x (ii) ||x|+x| - |x| -x (iii) 12 (iv) 0 (v)0	

DIFFERENTIATION

1	Find $\dfrac{dy}{dx}$ If (i) $y = \log(\sin \sqrt{1+x^2})$ (ii) $y = \sin[\sin(\log 3x)]$ (iii) $y = \sin(x^x) + (\sin x)^x$ (iv) $y = (\log x)e^{\tan x + x^2}$ (v) $y = \dfrac{x^4\sqrt{x+6}}{(3x+5)^2}$ (vi) $\sin y = x \sin(a+y)$ (vii) $y = \sec^{-1}\left(\dfrac{\sqrt{x}+1}{\sqrt{x}-1}\right) + \sin^{-1}\dfrac{\sqrt{x}-1}{\sqrt{x}+1}$, (viii) $y = \tan^{-1}\left\{\dfrac{\sqrt{1+x^2} - \sqrt{1-x^2}}{\sqrt{1+x^2} + \sqrt{1-x^2}}\right\}$, (ix) $y = \cos^{-1}\left[\dfrac{2x - 3\sqrt{1-x^2}}{\sqrt{13}}\right]$, Ans.(i) $\dfrac{x\cot(\sqrt{1+x^2})}{\sqrt{1+x^2}}$ (ii) $\dfrac{1}{x}\cos(\log 3x).\cos[\sin(\log 3x)]$ (iii) $\cos(x^x)x^x(1+\log x) + (\sin x)^x[x\cot x + \log \sin x]$ (iv) $\dfrac{e^{\tan x + x^2}}{x} + \log x.e^{\tan x + x^2}\left(\sec^2 x + 2x\right)$ (v) $\dfrac{x^4\sqrt{x+6}}{(3x+5)^2}\left(\dfrac{15x^2 + 117x + 240}{(2x+12)(3x^2+5x)}\right)$ (vi) $\dfrac{dy}{dx} = \dfrac{\sin^2(a+y)}{\sin a}$ (vii) 0	
2	if $x^y + y^x = a^b$, then find $\dfrac{dy}{dx}$. ans $-\dfrac{-y^x \log y - x^{y-1}y}{y^{x-1}x + x^y \log x}$	
3	If $x = a\cos\theta + b\sin\theta$, $y = a\sin\theta + b\cos\theta$, show that $y^2\dfrac{d^2y}{dx^2} - x\dfrac{dy}{dx} + y = 0$	
4	Find $\dfrac{dy}{dx}$, if $y = (\sin x)^x + (\sin^{-1}(\sqrt{x}))$ Ans. $(\sin x)^x[x\cot x + \log \sin x] + \dfrac{1}{2\sqrt{x}\sqrt{1-x}}$	
5	If $(ax+b)e^{y/x} = x$, prove that $x^3\dfrac{d^2y}{dx^2} = \left(x\dfrac{dy}{dx} - y\right)^2$	
6	(i) If $\log\left(\dfrac{x}{a+bx}\right)^x = y$, prove that $x^3\dfrac{d^2y}{dx^2} = \left(x\dfrac{dy}{dx} - y\right)^2$	

	(II) If $y = \log\sqrt{x^2 + y^2} = \tan^{-1}\left(\dfrac{x}{y}\right)$. Show that $\dfrac{dy}{dx} = \dfrac{y-x}{y+x}$	
7	If $y = \sqrt{x+1} - \sqrt{x-1}$. Show that $(x^2 - 1)\dfrac{d^2y}{dx^2} + x\dfrac{dy}{dx} + \dfrac{1}{4}y = 0$	
8	If $x = \alpha \sin 2t(1 + \cos 2t)$ and $y = \beta\cos 2t(1 - \cos 2t))$, show that at $t = \dfrac{\pi}{4}$, $\dfrac{dy}{dx} = \dfrac{\beta}{\alpha}$	
9	If $x \sin(a + y) + \sin a \cos(a + y) = 0$, then prove that $\dfrac{dy}{dx} = \dfrac{\sin^2(a+y)}{\sin a}$	
10	Find the derivative of the following function f(x) w.r.t. x : $\sin^{-1}\left(\dfrac{2^{x+1}.3^x}{1+(36)^x}\right)$ ans $2\left[\dfrac{1}{1+\left(6^x\right)^2}\right]6^x \log 6$	
11	Differentiate $y = \sec^{-1}\left\{\dfrac{1}{2x^2 - 1}\right\}$, w.r.t. $\sqrt{1-x^2}$ at x = ½ . ans. 4	
12	If the function $f(x) = |x - 3| + |x - 4|$, then show that f(x) is not differentiable at the points x = 3 and x = 4	
13	Find the value of k for which $f(x) = \begin{cases} \dfrac{\sqrt{1+kx} - \sqrt{1-kx}}{x} & \text{if } -1 \leq x < 0 \\ \dfrac{2x+1}{x-1} & \text{if } 0 \leq x < 1 \end{cases}$ is continuous at x = 0	
14	Determine the value of k , if $f(x) = \begin{cases} \dfrac{k\cos x}{\pi - 2x}, & \text{if } x \neq \dfrac{\pi}{2} \\ 3, & \text{if } x = \dfrac{\pi}{2} \end{cases}$ is continuous at x = $\dfrac{\pi}{2}$	
15	Find a so that f(x) = $\begin{cases} a\sin\left[\dfrac{\pi}{2}(x+1)\right] & \text{if } x \leq 0 \\ \dfrac{\tan x - \sin x}{x^3} & \text{if } x > 0 \end{cases}$ is continuous at x = 0.	