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# Dwarka International School

## Session 2024-25

Class-XII

COMMERCE



*Full of joy is early Summer,  
Growth and warmth and golden light;  
Every day is crowned with beauty,  
Full of loveliness the night.  
Dazzling sunshine brings the roses,  
Fills the whole bright world with bloom;  
Day and night rejoice together,  
Banished now are doubt and gloom.  
-Ellwood Roberts*

Dear Students and Parents,

As we embark on the summer vacation, I want to remind you of the importance of continued learning and growth during this time away from school.

To ensure that our students remain engaged and academically stimulated, we have assigned summer vacation homework for all classes. This homework is designed to reinforce concepts learned throughout the year and to prepare students for the upcoming academic term.

I urge all students to approach their summer homework with diligence and responsibility. Completing these assignments will not only enhance your academic skills but also help you start the new school year on the right foot.

Parents, your support in encouraging your children to complete their summer homework is invaluable. By working together, we can ensure that our students continue to thrive academically.

#### GUIDELINES FOR STUDENTS

- Ensure timely submission of holiday homework after the reopening of the school.
- Try to incorporate creativity and innovation.
- Revise all the topics that have been taught by your subject teachers in the new session.
- UT 2 syllabus is provided at the end. Kindly revise.
- UT2 will commence from 22<sup>nd</sup> July 2024

Wishing everyone a productive and enjoyable summer break! Warm regards.

**DWARKA INTERNATIONAL SCHOOL**  
**HOLIDAY HOME WORK**  
**CLASS XII COMMERCE (2024-25)**

**SUBJECT-ENGLISH CORE-301**

**A. Q 1 to Q 7 should be done in your English note books.**

Q1. Read the lesson 'The Enemy' by Pearl. S. Buck from Vistas and answer the following questions in detail:

- a. What was the General's plan to get rid of the American prisoner? Was it executed? What traits of General's character are highlighted in the lesson?
- b. What conflicting ideas arise in Dr Sadao's mind after he has brought the wounded American soldier home? How is the conflict resolved?
- c. Do you think Dr Sadao's final decision was the best possible one in the circumstances? Why/Why not? Explain with reference to the story, 'The Enemy'
- d. What impression do you form about Dr Sadao as a man and as a surgeon on your reading the chapter 'The Enemy'?
- e. Dr Sadao was compelled by his duty as a doctor to help the enemy soldier. What made Hana, his wife, sympathetic to him in the face of open defiance from the domestic staff?

Q2. You are Ankit/Amrita, staying at 4 Pycrofts Road, Chennai. You have come across an advertisement in The Times of India for recruitment of computer engineer trainees by Shivam Software. Apply in response to this advertisement, giving your detailed bio-data (curriculum vitae). Invent all necessary details.

Q3. You are Swati Rai/Swastik Sen of A-45 Vasant Enclave, New Delhi. You are tired of the sermons on cut throat competition, success, chasing goals, accomplishing targets and deadlines. You feel that instead of participating in the rat race it is time to sit, meditate and introspect before plunging into the world of materialism. Taking cues from Pablo Neruda's Keeping Quiet along with your inputs write an article on Introspection: The Need of the Hour.

Q4. You are Josely Mathew, the President of the school book club. The club is organising a drive for promoting reuse of study materials and books. Draft a notice in about 50 words, for the school notice board, addressing students of classes X-XII, informing them about this drive and urging them to contribute to the endeavour. Mention how the donated books would benefit a charitable cause.

Q5. 'Aunt Jennifer's Tigers' exemplifies the eternity and immortality of art which is used as a device to escape from hopelessness and dejection. Perhaps Aunt Jennifer finds comfort in this creative expression, crafting a bold tapestry that will outlive her and Uncle both, and that shows nature's creatures living wild and unafraid, liberated from man-made constraints like marriage. Write an article on the topic 'Art is Immortal' on the basis of the poem as well as your own interpretations.

Q6. Linguistic Chauvinism is a shame, yet history is witness to many such instances of language dominance resulting in the classification of people into the 'oppressor' and 'oppressed'. Little Franz experienced it on the day of the last lesson and wonders if the Germans would make the pigeons sing in German. You being Franz decide to pen down the events of the day. Write a draft in the form of a report.

## Cues

Heading-The Last Lesson

Byline- by Franz

First Paragraph- 5Ws-what, when, where, why, who

Second Paragraph-sequence of events, description of events

Third Paragraph- sum up, end on an optimistic note

### ➤ Do not use personal pronouns in your report

Q7. After passing the secondary school examination, a candidate has to make a very difficult choice from a number of streams available to him at the senior school level for further studies. There is not a valid mechanism to assess the suitability of a candidate for a particular stream. Write a letter to the Editor of a national daily emphasising the need for educational counsellors for guidance in this matter in each school. You are Vinita/Vinay, 48, Agra Fort, Agra.

## B. Project Work-Board Internal Assessment

(i) Select a topic from the literature syllabus or general affairs and burning topics

The following topics can be taken-

- (a) Climate Change- Vistas- Lesson-Journey to the End of the Earth by Tishani Doshi
- (b) Racial Discrimination- Vistas- Lesson-Memories of Childhood by Zitkala-Sa and Bama
- (c) Child Labour-Flamingo-Lesson- Lost Spring by Anees Jung
- (d) Appearances are deceptive-Lesson-On the Face of It by Susan Hill
- (e) Adolescent Fantasizing-Lesson-Going Places by A.R. Barton
- (f) Childhood Phobia-Lesson-Deep Water by William Douglas
- (g) Escapism-Lesson-The Third Level by Jack Finney
- (h) Linguistic Chauvinism-Lesson-The Last Lesson by Alphonse Daudet
- (i) Economic Disparity-Poetry-A Roadside Stand by Robert Frost
- (j) Silence and Introspection-Poetry Keeping Quiet by Pablo Neruda

## Format of the Project

The Project can be done individually or in a group. The maximum members in a group should not exceed 4.

- **First Page**-Cover page, school logo, title of project, school details/details of students
- **Second Page**-Statement of purpose/objectives/goals
- **Third Page**-Certificate of completion under the guidance of the teacher.
- **Fourth Page**-Students' input on the topic, their research and interpretation/Essay/Script/Report
- **Fifth Page**- Students' input on the topic, their research and interpretation/ Essay/Script/Report
- **Sixth Page**- Students' input on the topic, their research and interpretation/ Essay/Script/Report
- **Seventh Page**-Students' input on the topic, their research and interpretation/ Essay/Script/Report
- **Eighth Page**-Students' reflections
- **Ninth Page**-Students' reflections
- **Tenth Page**-List of resources/bibliography

## Note

The Project Work should be done on A-4 sized sheets and after the completion of the project should be compiled within a file.

## UT-2 SYLLABUS

### READING SKILLS

FACTUAL/DISCURSIVE PASSAGE

### LITERATURE

**FLAMINGO**

CH-The Last Lesson by Alphonse Daudet

Poetry- Keeping Quiet by Pablo Neruda

Poetry- Aunt Jennifer's Tigers

**VISTAS**

CH- The Tiger King by Kalki

**WRITING SKILLS**

Formal Invitation and Replies, Letter to Editor

**SUBJECT: BUSINESS STUDIES (054)****A. PROJECT WORK****I. Project ONE: Principles of Management**

The students are required to visit any one of the following:

1. A departmental store.
2. An Industrial unit.
3. A fast food outlet.

They are required to observe the application of the general Principles of management advocated by Fayol. Fayol's principles

1. Division of work.
2. Unity of command.
3. Unity of direction.
4. Scalar chain
5. Espirit de corps
6. Fair remuneration to all.
7. Order.
8. Equity.
9. Discipline
10. Subordination of individual interest to general interest.
11. Initiative.
12. Centralisation and decentralisation.
13. Stability of tenure.
14. Authority and Responsibility

OR

They may enquire into the application of scientific management techniques by F.W. Taylor in the unit visited.

Scientific techniques of management.

1. Functional foremanship.

2. Standardisation and simplification of work.
3. Method study.
4. Motion Study.
5. Time Study.
6. Fatigue Study
7. Differential piece rate plan

The observations could be on the basis of

- λ The different stages of division of work resulting to specialisation.
  - λ Following instructions and accountability of subordinates to higher authorities.
  - λ Visibility of order and equity in the unit.
  - λ Balance of authority and responsibility.
  - λ Communication levels and pattern in the organisation.
  - λ Methods and techniques followed by the organisation for unity of direction and coordination amongst all.
  - λ Methods of wage payments followed. The arrangements of fatigue study.
  - λ Derivation of time study.
- 
- λ Derivation and advantages of method study.
  - λ Organisational chart of functional foremanship.
  - λ Any other identified in the organisation
  - λ students should prepare observation tools to be used for undertaking the project. Examples; worksheets, questionnaire, interviews and organisational chart etc

## **II. Project two: Stock Exchange**

The students are expected to:

- a) Develop a brief report on History of Stock Exchanges in India. (your country)
- b) Prepare a list of at least 25 companies listed on a Stock Exchange.
- c) To make an imaginary portfolio totalling a sum of Rs. 50,000 equally in any of the 5 companies of their choice listed above over a period of twenty working days.

The students may be required to report the prices of the stocks on daily basis and present it diagrammatically on the graph paper.

- λ They will understand the weekly holidays and the holidays under the Negotiable Instruments Act. They will also come across with terms like closing prices, opening prices, etc.
- λ During this period of recording students are supposed to distinctively record the daily and starting and closing prices of the week other days under the negotiable instrument act so that they acquire knowledge about closing and opening prices.

λ The students may conclude by identifying the causes in the fluctuations of prices. Normally it would be related to the front page news of the a business journal, for example,

λ Change of seasons.

λ Festivals.

λ Spread of epidemic.

λ Strikes and accidents

λ Natural and human disasters.

λ Political environment.

λ Lack of faith in the government policies.

λ Impact of changes in government policies for specific industry.

λ International events.

λ Contract and treaties at the international scene.

λ Relations with the neighbouring countries.

λ Crisis in developed countries, etc.

The students are expected to find the value of their investments and accordingly rearrange their portfolio. The project work should cover the following aspects;

1. Graphical presentation of the share prices of different companies on different dates.
2. Change in market value of shares due to change of seasons, festivals, natural and human disasters.
3. Change in market value of shares due to change in political environment/ policies of various countries/crisis in developed countries or any other reasons
4. Identify the top ten companies out of the 25 selected on the basis of their market value of shares. It does not matter if they have made profits or losses.

### **III. Project three: Marketing**

The students are required to make a project on the identified product/service keeping in mind the following:

1. Why have they selected this product/service?
2. Find out '5' competitive brands that exist in the market.
3. What permission and licences would be required to make the product?
4. What are your competitors Unique Selling Proposition.[U.S.P.]?
5. Does your product have any range give details?
6. What is the name of your product?
7. Enlist its features. 8. Draw the 'Label' of your product.
9. Draw a logo for your product.
10. Draft a tag line.
11. What is the selling price of your competitor's product?
  - (i) Selling price to consumer

(ii) Selling price to retailer

(iii) Selling price to wholesaler

What is the profit margin in percentage to the

λ Manufacturer. λ Wholesaler. λ Retailer.

12. How will your product be packaged?

13. Which channel of distribution are you going to use? Give reasons for selection?

14. Decisions related to warehousing, state reasons.

15. What is going to be your selling price?

(i) To consumer (ii) To retailer (iii) To wholesaler

16. List 5 ways of promoting your product.

17. Any schemes for (i) The wholesaler (ii) The retailer (iii) The consumer

18. What is going to be your 'U.S.P'?

19. What means of transport you will use and why?

20. Draft a social message for your label.

21. What cost effective techniques will you follow for your product.

22. What cost effective techniques will you follow for your promotion plan. At this stage the students will realise the importance of the concept of marketing mix and the necessary decision regarding the four P's of marketing.

λ Product λ Place λ Price λ Promotion

On the basis of the work done by the students the project report should include the following:

1. Type of product /service identified and the (consumer/industries) process involve there in.
2. Brand name and the product.
3. Range of the product.
4. Identification mark or logo.
5. Tagline.
6. Labeling and packaging.
7. Price of the product and basis of price fixation.
8. Selected channels of distribution and reasons thereof.
9. Decisions related to transportation and warehousing. State reasons.
10. Promotional techniques used and starting reasons for deciding the particular technique.
11. Grading and standardization.

**Guidelines:**

1. The total length of the project will be of 30 to 40 pages.
2. The project should be handwritten.
3. The project should be presented in a neat folder.
4. The project report should be developed in the following sequence-
5. Cover- Red handmade sheet (A4 Size)



- λ Cover page should include the title of the Project, student information, school and year.
- λ List of contents.
- λ Acknowledgements and preface (acknowledging the institution, the places visited and the persons who have helped).
- λ Introduction.
- λ Topic with suitable heading.
- λ Planning and activities done during the project, if any.
- λ Observations and findings of the visit.
- λ Conclusions (summarized suggestions or findings, future scope of study).
- λ Appendix
- λ Teacher's observation.
- λ The following roll no. will make the projects on the topic given:

TOPIC	ROLL NO.
Project One: Principles of Management	1 to 10
Project two: Stock Exchange	11 to 20
Project three: Marketing	21 to 29

**B.** Read chapter number 1, 2, 3 and 4 thoroughly and prepare 10 MCQs. from each (to be done in the notebook)

**NOTE: UNIT TEST -2 (SYLLABUS)**

Unit 3: Business Environment, Unit 4: Planning, Unit 5: Organising , Unit 6: Staffing

**SUBJECT-ACCOUNTANCY (055)**

1. Goodwill may be defined as excess amount paid for a business over and above its -----  
 (a) Tangible assets (b) Current assets (c) Total assets (d) Net Assets
2. Goodwill is an intangible asset but not a----- asset.  
 (a) Fixed (b) Fictitious (c) Saleable
3. Goodwill of a firm is affected by its:  
 (a) Location (b) Nature of business (c) Degree of competition (d) All of these
4. Goodwill of the firm is not valued during  
 (a) Admission of partner (b) Retirement / death of partner (c) Amalgamation of two firm  
 (d) Dissolution of partnership firm
5. If average capital employed in a firm is ₹8,00,000, average of actual profits is ₹1,80,000 and normal rate of return is 10%, then value of goodwill as per capitalization of average profits is:  
 (A) ₹10,00,000 (B) ₹18,00,000 (C) ₹80,00,000 (D) ₹78,20,000
6. Need for valuation of goodwill arises at the time of  
 (a) Change in profit sharing ratio (b) Admission of new partner (c) Retirement / death of partner  
 (d) All of these.
7. At the time of calculation of average profit

- (a) Abnormal profit will be deducted (b) Abnormal profit will be added  
(c) Both (a) and (d) None of these

8. As per accounting standard 26, which goodwill is shown in the accounting books  
(a) Purchased goodwill (b) Self-generated goodwill (c) above (a) and (b) both (d) None of these
9. Average profit earned by a firm is Rs. 75,000 which includes undervaluation of stock of Rs. 5,000 on average basis. The capital invested in the business is Rs. 7,00,000 and the normal rate of return is 7%. What will be the amount of goodwill on the basis of 5 times the super profit?  
(a) Rs. 1,55,000 (b) 31,000 (c) 1,30,000 (d) 1,05,000
10. M/s. Supertech India has assets of Rs. 5,00,000, whereas liabilities are: Partners' Capitals - Rs. 3,50,000, General Reserve - 60,000 and Sundry Creditors - Rs. 90,000. If Normal Rate of Return is 10% and Goodwill of the firm is valued at Rs. 90,000 at 2 years', purchase of super profit, the Average Profit of the firm will be  
(a) Rs. 46,000 (b) Rs. 86,000 (c) Rs. 1,63,000 (d) Rs. 23,000
11. A firm earned Rs. 60,000 as profit, the normal rate of return being 10%. Assets of the firm are Rs. 7,20,000 (excluding goodwill) and external liabilities Rs. 2,40,000. Find the value of goodwill by Capitalisation of average profit method.  
(a) Rs. 2,40,000 (b) Rs. 1,80,000 (c) Rs. 1,20,000 (d) Rs. 60,000
12. Assertion(A): Goodwill is the good name or reputation of the Business which brings benefit to the business.  
Reason(R): It is an intangible asset as it has no physical existence  
(a) Both A and R are true and R is the Correct explanation of A  
(b) Both A and R are true and R is not the correct explanation of A  
(c) A is true but R is false  
(d) A is false but R is true
13. Assertion(A): Both purchase and self-generated goodwill are accounted in the books of account  
Reason (R): According to AS-26 only purchase goodwill is accounted in the books of account. Self-generated goodwill is not accounted in the books of account  
(a) A is correct but R is not correct  
(b) R is correct but A is not correct  
(c) Both A and R is correct  
(d) Both A and R not correct

**From the following information of M/s Sharma and Gupta give the answer of question number 14 to 17**

**INFORMATION:**

- (a) Average capital employed - Rs. 10,00,000  
(b) Net profit of the firm for the past years 2019 - Rs. 1,60,000; 2020 - Rs. 1,40,000; 2021- Rs. 2,70,000  
(c) Normal rate of return on capital employed is 11%  
(d) Remuneration to each partner for his service to be treated as a charge on profit - 2,500 per month
14. Value of Goodwill at three year's purchase of Average Profit  
(a) Rs. 3,90,000 (b) Rs. 1,30,000 (c) Rs. 1,90,000 (d) None of the above.

15. Value of Goodwill at three year's purchase of Super Profit  
(a) Rs. 1,50,000 (b) Rs. 2,00,000 (c) Rs. 60,000 (d) Rs. 3,90,000
16. Value of Goodwill on the basis of Capitalisation of Super Profit  
(a) Rs. 60,000 (b) Rs. 1,81,818 (c) Rs. 3,90,000 (d) Rs. 40,000
17. Value of Goodwill on the basis of Capitalisation of Average Profit  
(e) Rs. 40,000 (b) Rs. 60,000 (c) Rs. 300,000 (d) Rs. 1,81,81

On 31<sup>st</sup> March, 2019 the Balance Sheet of A and B, who were sharing profits in the ratio of 3 : 2 was as follows :

**Balance Sheet of A and B as at 31<sup>st</sup> March, 2019**

Liabilities	Amount ₹	Assets	Amount ₹
Creditors	30,000	Cash at Bank	20,000
Investment Fluctuation Fund	12,000	Debtors 85,000	
General Reserve	25,000	Less : Provision for bad debts 5,000	80,000
Capitals :		Stock	1,30,000
A 1,60,000		Investments	60,000
B <u>1,40,000</u>	3,00,000	Furniture	77,000
	<u>3,67,000</u>		<u>3,67,000</u>

On 1<sup>st</sup> April, 2019, they decided to admit C as a new partner for  $\frac{1}{5}$ <sup>th</sup> share in the profits on the following terms :

- (i) C brought ₹ 1,00,000 as his capital and ₹ 50,000 as his share of premium for goodwill.
- (ii) Outstanding salaries of ₹ 2,000 be provided for.
- (iii) The market value of investments was ₹ 50,000.
- (iv) A debtor whose dues of ₹ 18,000 were written off as bad debts paid ₹ 12,000 in full settlement.

Prepare Revaluation Account, Partners' Capital Accounts and the Balance Sheet of the new firm.

Divya, Yasmin and Fatima are partners in a firm, sharing profits and losses in 11:7:2 respectively. The balance sheet of the firm as on 31<sup>st</sup> March 2018 was as follows:

**Balance Sheet  
As at 31.3.2018**

Liabilities	Amount (₹)	Assets	Amount (₹)
Sundry Creditors	70,000	Factory Building	7,35,000
Public Deposits	1,19,000	Plant and Machinery	1,80,000
Reserve fund	90,000	Furniture	2,60,000
Outstanding Expenses	10,000	Stock	1,45,000
Capital accounts		Debtors	1,50,000
Divya	5,10,000	Less: Provision (30,000)	1,20,000
Yasmin	3,00,000	Cash at bank	1,59,000
Fatima	5,00,000		
	<b>13,10,000</b>		
	<b>15,99,000</b>		<b>15,99,000</b>

On 1.4.2018, Aditya is admitted as a partner for one-fifth share in the profits with a capital of ₹4,50,000 and necessary amount for his share of goodwill on the following terms:

- i. Furniture of ₹2,40,000 were to be taken over Divya, Yasmin and Fatima equally.
- ii. A creditor of ₹ 7,000 not recorded in books to be taken into account.
- iii. Goodwill of the firm is to be valued at 2.5 years purchase of average profits of last two years. The profit of the last three years were:  
2015-16 ₹6,00,000; 2016-17 ₹2,00,000; 2017-18 ₹6,00,000
- iv. At time of Aditya's admission Yasmin also brought in 50,000 as fresh capital
- v. Plant and Machinery is re-valued to ₹2,00,000 and expenses outstanding were brought down to ₹ 9,000. Prepare Revaluation Account, Partners Capital Account and the balance sheet of the reconstituted firm.

**UNIT TEST-2 (SYLLABUS)**

**Change in profit sharing ratio**

**Admission of partner**

**Retirement of partner**

## **SUBJECT-ECONOMICS (030)**

A. **Prepare a Project file** (submitted for Class XII board exam practical Examination) by conducting survey and collect data by designing a Questionnaire/Case study on any one of the following topics:

- Micro and small-scale industries
- Contemporary Employment situation in India.
- Disinvestment policy of the government
- Health expenditure
- Goods and Services Tax Act and its impact on GDP
- Aatmanirbhar Bharat
- Environmental Crises
- Self-help groups
- Budget deficit
- Cashless Economy
- Inclusive Growth Strategy
- Exchange Rate determination-Methods and Techniques
- Balance of payments
- Make in India -The way ahead
- Demonetization
- Indian economy on the eve of independence
- Role of Reserve Bank of India in control of Credit
- Horticulture
- Green Revolution
- Digital India- Step towards the future
- Sarva Shiksha Abhiyan
- Foreign Direct Investment
- Minimum Support Prices
- Public Sector undertaking (BHEL)
- Dairy Farming Poultry Farming
- Rural Development- factors and govt. initiatives
- Liberalization
- Privatization
- Globalization
- Outsourcing
- Special Economic Zone
- Cryptocurrency
- Agricultural Marketing
- Rural Credit/Banking
- NABARD
- Human capital development and economic growth in India
- Poverty
- Sustainable development- A new approach
- Global warming/Ozone Depletion

- Taxes and economic growth in India
- Non-conventional sources of energy Wind power, Hydropower, Solar power
- Money Multiplier/ Credit creation process
- Govt. Budget and its components
- Monetary policy committee and its functions
- Organic Farming-Back to the nature
- Relation between Stock Price Index and Economic health of a nation
- Start-up India and its impact
- Pre-independence role of railways-A critical analysis
- Growth of education sector in India
- Comparative study of China, Pakistan and India
- Any other topic.

### **Synopsis for the Project**

1. Cover Page: Cover page should be very attractive and should contain the name of the school, School mono, Session, Subject, Title, Name of the student (Submitted By), Name of the Teacher, (Submitted To) .
2. Certificate.
3. Acknowledgment.
4. Table of Contents/Index.
5. Main work:
  - Justification of the title.
  - Objectives of the project
  - Introduction/ Prologue
  - Content: Meaning, Features, Causes, Various stakeholders and effect on each of them, Pros and cons of the concept, Major criticism related to the topic (if any), Short-term and long-term implications of economic strategies suggested in the course of research, Data chart, Diagrammatic and Tabular presentation, Newspaper cutting, Graphs, Pictures, photos, Numerical etc.
6. Students' own views/perception/ opinion and learning from the work.
7. Conclusion/ Suggestions/Epilogue.
8. Bibliography.

### **General Instructions**

- Select the topic carefully as it is important to have thorough knowledge of the content so as to present you confidently in the VIVA.
- The project length should neither be too long nor too small. Generally, it should range between 50-60 pages.
- Matter should be written on one side of the paper and Diagrams /Flow charts/Schedule should be made the flip side only.
- Project should be neat and systematically presented.
- Use new ideas and creativity to make your project attractive.
- Avoid overwriting and use of white ink.

- Case study or Research is compulsory.
- No floral sheets to be used.
  - It will be an independent, self-directed piece of study

**WORKSHEET**  
**NATIONAL INCOME /MONEY AND BANKING**

Q1. Define consumption goods.

Q2. Foreign embassies in India are a part of India's: (Choose the correct alternative)

- (a) Economic Territory (b) Geographical territory  
(c) Both (a) and (b) (d) None of the above

Q3. Supply of money refers to quantity of money \_\_\_\_\_ (Choose the correct alternative)

- (a) As on 31st March (b) During any specified period of time  
(c) As on any point of time (d) During a fiscal year

Q4. Demand deposits include \_\_\_\_\_ (Choose the correct alternative)

- (a) Saving account deposits and fixed deposits  
(b) Saving account deposits and current account deposits  
(c) Current account deposits and fixed deposits  
(d) All types of deposits

Q5. Market Price and factor cost will be equal when there is:

- (a) No direct tax (b) No Indirect tax  
(c) No Subsidy (d) No Indirect tax and No subsidy

Q6. State, giving reasons, whether the following statements are true or false:

- (a) Currency created by the Central Bank is called bank money.  
(b) Higher the Legal Reserve Ratio (LRR), greater would be the money creation in the economy.  
(c) Money supply is a stock variable

Q7. Giving reasons classify the following into stocks and flows:

- (a) Wealth (b) Savings (c) Gross Domestic Product

Q8. Discuss briefly, the circular flow of income in a two-sector economy with the help of a suitable diagram.

Q9. How will you treat the following in the calculation of Gross Domestic Product of India? Give reasons for your answer.

- (a) Profits earned by a branch of foreign bank in India  
(b) Salaries of Indian Employees working in embassy of Japan in India  
(c) Salary of resident of Japan working in Indian embassy in Japan.

Q10. Calculate (a) Net Value added at factor cost and (b) Value of output at market price from the following data.

Items	Amount (in Arab)
Subsidies	40
Intermediate costs	200
Compensation of employees	400
Depreciation	50



Royalty	5
Interest	25
Net Change in stocks	20
Indirect Taxes	100
Rent	10
Profits	60

Q11. Explain the 'varying reserve requirements' method of credit control by the central bank.

OR

Explain the role of Reverse Repo Rate in increasing money supply.

Q12. 'GDP as an index of welfare may understate or overstate welfare'. Explain the statement using examples of a positive and a negative externality.

OR

Differentiate between National Income at Current prices and National Income at Constant Price. Which of the two presents a better view of the economic growth of economy and why?

Q13. Government provides essential items of food grains almost free to the families below the poverty lines. Which objective the government is trying to fulfil through the government budget and how? Explain.

Q14. From the following data relating to a firm

(a) Estimate the net value added at market prices

(b) Show that net value added at factor cost is equal to the sum of factor incomes.

Particulars	Amount (Rs in lakh)
Purchase of raw materials and other inputs from the domestic market	600
Increase in stocks	200
Domestic sales	1800
Imports of raw materials	100
Exports	200
Depreciation	75
Salaries and wages	600
Interest Payments	450
Rent	75
Dividends	150
Undistributed Profits	80
Corporate Profit Tax	20
Indirect Taxes	50

Q15. State giving reasons whether the following will be included in national income:

(i) Growing vegetables in a kitchen garden of the house/services rendered by family members to each other.

(ii) Production of tobacco products, liquor, etc.

(iii) Harmful effects of air pollution caused by factories or vehicles.

Q16. Using a numerical example elaborate the credit creation process as handled by the

commercial banks.

(Do the given worksheet in register)

**Note- UT-2 Syllabus-** Macroeconomics-Unit-1(National Income and related aggregates)  
Indian Economic Development- Chapter2 and 3

## **SUBJECT: MATHEMATICS**

### **Topic: Art integration with Mathematics**

Art and mathematics closely related in terms of reasoning skills and pattern recognition. Artists and Mathematicians, both use geometry in their work, including shapes, symmetry, proportions and measurements.

Keeping all this in mind students will do one of the following project according to their choices:

**1. Using Golden Ratio(1:1.618) create designs of different objects**

(Ref ; <https://99designs.com/blog/tips/the-golden-ratio/>)

**2. Draw a portrait using Mathematical formulas.**

(Image for ref : [https://drive.google.com/file/d/1Hvtd9jDzFHfw6Miv61jB0Ta\\_5QGHjoVC/view](https://drive.google.com/file/d/1Hvtd9jDzFHfw6Miv61jB0Ta_5QGHjoVC/view))

**3. Learn how to use Microsoft, Excel for addition, subtraction, multiplication and transpose of matrices.** Make a soft copy of the same and paste screenshot of the output on the file along with the project.

**4. Make a project on Sacred Geometry**

(Ref: [Sacred Geometry: Symbols, Patterns & Shapes of Divine Creation \(uniguide.com\)](http://uniguide.com/sacred-geometry))

**Please note the following Specifications for the above projects:**

- (i) Page 1 should have your name ,class, section and the PROJECT NAME
- (ii) Page 2 should have Certificate where you recognise the people and thank them for the help they have given you in putting this project together.
- (iii) Page 3 will be the contents page
- (iv) Page 4 should have objective
- (v) Page 5 to 9 will cover the project itself
- (vi) Please make a proper front and back cover for your project.
- (vii) Submit the project in file

### **CHAPTER – RELATIONS AND FUNCTIONS,MATRICES & DETERMINANTS, DERIVATIVES**

**NOTE: Do the worksheet in your school register. Work should be done neatly.**

### Competency Based Questions- MCQ

1. Let  $A = \{1, 2, 3\}$  and consider the relation  $R = \{(1, 1), (2, 2), (3, 3), (1, 2), (2, 3), (2, 1)\}$ . Then  $R$  is  
(a) an equivalence relation (b) reflexive and symmetric but not transitive  
(c) reflexive and transitive but not symmetric (d) reflexive but neither symmetric nor transitive
2. Let  $A = \{1, 2, 3\}$  and consider the relation  $R = \{(1, 1), (2, 2), (3, 3), (1, 2), (2, 3), (1, 3), (3, 1)\}$ . Then  $R$  is  
(a) an equivalence relation (b) reflexive and symmetric but not transitive  
(c) reflexive and transitive but not symmetric (d) reflexive but neither symmetric nor transitive
3. Let  $A = \{1, 2, 3\}$  and consider the relation  $R = \{(1, 1), (2, 2), (3, 3), (1, 2), (2, 1)\}$ . Then  $R$  is  
(a) reflexive and symmetric but not transitive (b) reflexive but neither symmetric nor transitive  
(c) an equivalence relation (d) reflexive and transitive but not symmetric
4. Let  $A = \{1, 2, 3\}$  and consider the relation  $R = \{(1, 1), (1, 2), (2, 1)\}$ . Then  $R$  is  
(a) reflexive and symmetric but not transitive (b) symmetric but neither reflexive nor transitive  
(c) reflexive but neither symmetric nor transitive (d) reflexive and transitive but not symmetric
5. Let  $A = \{1, 2, 3\}$  and consider the relation  $R = \{(1, 3)\}$ . Then  $R$  is  
(a) transitive (b) symmetric  
(c) reflexive (d) none of these
6. Let  $A = \{1, 2, 3\}$  and consider the relation  $R = \{(1, 1), (2, 2), (3, 3)\}$ . Then  $R$  is  
(a) reflexive and symmetric but not transitive (b) reflexive but neither symmetric nor transitive  
(c) reflexive and symmetric and transitive (d) reflexive and transitive but not symmetric
7. Let  $A = \{1, 2, 3\}$  and  $R = \{(1, 1), (2, 3), (1, 2)\}$  be a relation on  $A$ , then the minimum number of ordered pairs to be added in  $R$  to make  $R$  reflexive and transitive.  
(a) 4 (b) 2  
(c) 3 (d) 1
8. The maximum number of equivalence relations on the set  $\{1, 2, 3\}$  is  
(a) 6 (b) 4  
(c) 3 (d) 5
9. Let  $R$  be a relation on the set  $N$  be defined by  $\{(x, y) : x, y \in N, 2x + y = 41\}$ . Then,  $R$  is  
(a) reflexive (b) symmetric  
(c) transitive (d) none of these
10. Relation  $R$  in the set  $Z$  of all integers defined as  $R = \{(x, y) : x - y \text{ is an even integer}\}$  is  
(a) reflexive and transitive (b) symmetric and Transitive  
(c) reflexive and symmetric (d) an equivalence relation
11. Let  $R$  be the relation on the set of all real numbers defined by  $a R b$  iff  $|a - b| \leq 1$ . Then,  $R$  is  
(a) reflexive and transitive (b) symmetric and Transitive  
(c) reflexive and symmetric (d) an equivalence relation
12. Consider the non-empty set consisting of children in a family and a relation  $R$  defined as  $a R b$  if  $a$  is sister of  $b$ . Then  $R$  is  
(a) symmetric but not transitive (b) transitive but not symmetric

(c) both symmetric and transitive

(d) neither symmetric nor transitive

**13.** Relation  $R$  in the set  $A = \{1, 2, 3, 4, 5, 6, 7, 8\}$  as  $R = \{(x, y) : x \text{ divides } y\}$  is

(a) reflexive and symmetric but not transitive

(b) reflexive and transitive but not symmetric

(c) reflexive but neither symmetric nor transitive

(d) symmetric but neither reflexive nor transitive

**14.** Let  $L$  denote the set of all straight lines in a plane. Let a relation  $R$  be defined by  $l_1 R l_2$  if and only

if  $l_1$  is perpendicular to  $l_2, \forall l_1, l_2 \in L$ . Then  $R$  is

(a) symmetric

(b) reflexive

(c) transitive

(d) reflexive and symmetric

**15.** If  $A = \{a, b, c\}$  then number of relations containing  $(a, b)$  and  $(a, c)$  which are reflexive and symmetric but not transitive is

(a) 4

(b) 3

(c) 2

(d) 1

**16.** The relation  $R$  in the set  $\{1, 2, 3, \dots, 13, 14\}$  defined by  $R = \{(x, y) : 3x - y = 0\}$  is

(a) symmetric

(b) reflexive

(c) transitive

(d) none of these

**17.** The relation  $R$  in the set of natural numbers  $N$  defined by  $R = \{(x, y) : x > y\}$  is

(a) reflexive and symmetric but not transitive

(b) transitive but neither reflexive nor symmetric

(c) reflexive but neither symmetric nor transitive

(d) symmetric but neither reflexive nor transitive

**18.** A function  $f : X \rightarrow Y$  is one-one (or injective), then which of the following is true?

(a)  $\forall x_1, x_2 \in X, f(x_1) = f(x_2) \Rightarrow x_1 = x_2$ .

(b)  $x_1 \neq x_2 \Rightarrow f(x_1) \neq f(x_2)$ .

(c) both (a) and (b) are true

(d) none of these

**19.** A function  $f : X \rightarrow Y$  is said to be onto (or surjective), then which of the following is true?

(a) if  $\forall y \in Y, \exists$  some  $x \in X$  such that  $y = f(x)$

(b) range of  $f = Y$

(c) both (a) and (b) are true

(d) none of these

**20.** A function  $f : X \rightarrow Y$  is said to be bijective, if  $f$  is

(a) one-one only

(b) onto only

(c) one-one but not onto

(d) one-one and onto

**21.** If a set  $A$  contains  $m$  elements and the set  $B$  contains  $n$  elements with  $n > m$ , then number of bijective functions from  $A$  to  $B$  will be:

(a)  $m \times n$

(b)  $m^n$

(c)  $n^m$

(d) 0

**22.** Which of the following functions from  $I$  (Set of Integers) to itself is a bijection?

(a)  $f(x) = x^3$

(b)  $f(x) = x + 2$

(c)  $f(x) = 2x + 1$

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

**23.** Let  $X = \{-1, 0, 1\}$ ,  $Y = \{0, 2\}$  and a function  $f : X \rightarrow Y$  defined by  $y = 2x^4$ , is

(a) one-one onto

(b) one-one into

(c) many-one onto

(d) many-one into

**24.** Let  $f(x) = x^2 - 4x - 5$ , then

(a)  $f$  is one-one on  $R$

(b)  $f$  is not one-one on  $R$

(c)  $f$  is bijective on  $R$

(d) None of these

25. The function  $f : \mathbb{R} \rightarrow \mathbb{R}$  given by  $f(x) = x^2$ ,  $x \in \mathbb{R}$  when  $\mathbb{R}$  is the set of real numbers, is

- (a) one-one and onto (b) onto but not one-one  
(c) neither one-one nor onto (d) one-one but not onto

26. The signum function,  $f : \mathbb{R} \rightarrow \mathbb{R}$  is given by  $f(x) = \begin{cases} 1, & \text{if } x > 0 \\ 0, & \text{if } x = 0 \\ -1, & \text{if } x < 0 \end{cases}$

- (a) one-one (b) many-one  
(c) onto (d) none of these

27. Let  $f : \mathbb{R} \rightarrow \mathbb{R}$  be defined by  $f(x) = \begin{cases} 3x, & \text{if } x \leq 1 \\ x^2, & \text{if } 1 < x \leq 3 \\ 2x, & \text{if } x > 3 \end{cases}$ , then  $f(-1) + f(2) + f(4)$  is

- (a) 9 (b) 3  
(c) 4 (d) 8

28. The greatest integer function  $f : \mathbb{R} \rightarrow \mathbb{R}$  be defined by  $f(x) = [x]$  is

- (a) one-one and onto (b) onto but not one-one  
(c) one-one but not onto (d) neither one-one nor onto

29. The function  $f : \mathbb{N} \rightarrow \mathbb{N}$ , where  $\mathbb{N}$  is the set of natural numbers is defined by

$$f(x) = \begin{cases} n^2, & \text{if } n \text{ is odd} \\ n^2 + 1, & \text{if } n \text{ is even} \end{cases}$$

- (a) one-one and onto (b) neither one-one nor onto  
(c) one-one but not onto (d) onto but not one-one

30. The total number of injective mappings from a set with  $m$  elements to a set with  $n$  elements,  $m \leq n$ , is

- (a)  $n^m$  (b)  $m^n$   
(c)  $mn$  (d)  $\frac{n!}{(n-m)!}$

## INVERSE TRIGONOMETRIC FUNCTIONS

### Multiple Choice Questions [MCQ]

1. Domain of  $\sin^{-1}(2x-1)$  is

- (a)  $[-1, 1]$  (b)  $[-1, 2]$   
(c)  $[1, 2]$  (d)  $[-1, -2]$

2. Domain of  $\sin^{-1} x + \cos x$  is

- (a)  $[-1, 1]$   
(c)  $[1, 2]$

- (b)  $[-1, 2]$   
(d)  $[-1, -2]$

3. Domain of  $\sin^{-1} \sqrt{x-1}$  is

- (a)  $[-1, 1]$   
(c)  $[-1, 2]$

- (b)  $[1, 2]$   
(d)  $[-1, -2]$

4. Principal value of  $\sec^{-1}(-2)$  is equal to

- (a)  $\frac{2\pi}{3}$   
(c)  $\frac{4\pi}{3}$

- (b)  $\frac{5\pi}{6}$   
(d)  $-\frac{2\pi}{3}$

5. Principal value of  $\sin^{-1}\left(\cos\frac{2\pi}{3}\right)$  is equal to

- (a)  $-\frac{2\pi}{3}$   
(c)  $-\frac{\pi}{6}$

- (b)  $\frac{\pi}{6}$   
(d)  $\frac{2\pi}{3}$

6. Principal value of  $\tan^{-1}\left(\tan\frac{15\pi}{4}\right)$  is equal to

- (a) 1  
(c)  $\frac{15\pi}{4}$

- (b)  $-\frac{\pi}{4}$   
(d)  $\frac{\pi}{4}$

7. Principal value of  $\sec^{-1}\left(2\sin\frac{3\pi}{4}\right)$  is equal to

- (a)  $\frac{\pi}{4}$   
(c)  $-\frac{3\pi}{4}$

- (b)  $-\frac{\pi}{4}$   
(d)  $\frac{3\pi}{4}$

8. Principal value of  $\cot^{-1}\left(\tan\frac{3\pi}{4}\right)$  is equal to

- (a)  $-\frac{\pi}{4}$   
(c)  $-\frac{3\pi}{4}$

- (b)  $\frac{\pi}{4}$   
(d)  $\frac{3\pi}{4}$

9. Principal value of  $\cos^{-1}\left(\cos\frac{3\pi}{2}\right)$  is equal to

(a)  $\frac{3\pi}{2}$

(c)  $-\frac{\pi}{2}$

(b)  $\frac{\pi}{2}$

(d)  $-\frac{3\pi}{2}$

10. Principal value of  $\sin^{-1}\left(\cos\frac{33\pi}{5}\right)$  is equal to

(a)  $\frac{3\pi}{5}$

(c)  $-\frac{\pi}{10}$

(b)  $\frac{\pi}{10}$

(d)  $-\frac{3\pi}{5}$

11. Principal value of  $\sin^{-1}\left(\sin\frac{3\pi}{5}\right)$  is equal to

(a)  $\frac{2\pi}{5}$

(c)  $-\frac{3\pi}{5}$

(b)  $\frac{3\pi}{5}$

(d)  $-\frac{2\pi}{5}$

12. Principal value of  $\cos^{-1}\left(\frac{\sqrt{3}+1}{2\sqrt{2}}\right)$  is equal to

(a)  $\frac{7\pi}{12}$

(c)  $\frac{11\pi}{12}$

(b)  $\frac{5\pi}{12}$

(d)  $\frac{\pi}{12}$

13. The value of  $\cos(\sin^{-1} x)$  is

(a)  $x$

(c)  $\frac{\sqrt{1-x^2}}{x}$

(b)  $\sqrt{1-x^2}$

(d)  $\frac{x}{\sqrt{1-x^2}}$

14. The value of  $\cot(\cos^{-1} x)$  is

(a)  $\frac{x}{\sqrt{1+x^2}}$

(c)  $\frac{\sqrt{1-x^2}}{x}$

(b)  $\sqrt{1-x^2}$

(d)  $\frac{x}{\sqrt{1-x^2}}$

15. The value of  $\sin^{-1}\left\{\cos\left(\sin^{-1}\frac{\sqrt{3}}{2}\right)\right\}$  is

(a)  $\frac{\sqrt{3}}{2}$

(b)  $-\frac{\pi}{6}$

(c)  $\frac{\pi}{6}$

(d)  $-\frac{\sqrt{3}}{2}$

16. The value of  $\tan^{-1}\left\{2\cos\left(2\sin^{-1}\frac{1}{2}\right)\right\}$  is

(a) 1

(b)  $\frac{3\pi}{4}$

(c)  $\frac{1}{2}$

(d)  $\frac{\pi}{4}$

17. The value of  $\cot\left[\sin^{-1}\left\{\cos\left(\tan^{-1}1\right)\right\}\right]$  is

(a) 1

(b)  $\frac{3\pi}{4}$

(c)  $\frac{1}{2}$

(d)  $\frac{\pi}{4}$

18. The value of  $\tan^{-1}\left\{2\sin\left(4\cos^{-1}\frac{\sqrt{3}}{2}\right)\right\}$  is

(a)  $\frac{2\pi}{3}$

(b)  $\frac{\pi}{3}$

(c)  $\frac{\sqrt{3}}{2}$

(d)  $\frac{\pi}{6}$

19. The value of  $\cos^{-1}\left(\cos\frac{2\pi}{3}\right) + \sin^{-1}\left(\sin\frac{2\pi}{3}\right)$  is

(a)  $\frac{2\pi}{3}$

(b)  $\frac{4\pi}{3}$

(c)  $\pi$

(d)  $\frac{\pi}{3}$

20. The value of  $\tan^{-1}\left(\tan\frac{5\pi}{6}\right) + \cos^{-1}\left(\cos\frac{13\pi}{6}\right)$  is

(a) 0

(b)  $\frac{5\pi}{6}$

(c)  $\frac{13\pi}{6}$

(d)  $3\pi$

## MATRICES

### Multiple Choice Questions [MCQ]

1. Write the number of all possible matrices of order  $2 \times 2$  with entries  $-1$  or  $0$  or  $1$  ?

(a) 27

(b) 64

(c) 81

(d) 54

2. If a matrix has 12 elements, the number of possible orders it can have :



- (a) 4 (b) 8  
(c) 3 (d) 6

3. A matrix  $A = [a_{ij}]_{3 \times 4}$ , whose elements are given by  $a_{ij} = \frac{1}{2}|i - 3j|^2$ , then  $a_{32}$  is :

- (a)  $\frac{9}{2}$  (b)  $\frac{9}{4}$   
(c)  $\frac{3}{2}$  (d) 2

4. If  $\begin{bmatrix} 3x+7 & 5 \\ y+1 & 2-3x \end{bmatrix} = \begin{bmatrix} 2 & y-2 \\ 8 & 7 \end{bmatrix}$ , then the values of x and y are :

- (a)  $x = -\frac{5}{3}, y = 5$  (b)  $x = -\frac{5}{3}, y = 7$   
(c)  $x = \frac{5}{3}, y = 7$  (d)  $x = -\frac{5}{3}, y = -7$

5. If  $\begin{bmatrix} x+y & 2 \\ 5+z & xy \end{bmatrix} = \begin{bmatrix} 6 & 2 \\ 5 & 8 \end{bmatrix}$  the values of x, y and z are:

- (a)  $x = 4, y = 2, z = 0$  or  $x = 2, y = 4, z = 0$  (b)  $x = -4, y = -2, z = 0$  or  $x = 2, y = 4, z = 0$   
(c)  $x = 4, y = -2, z = 0$  or  $x = 2, y = 4, z = 0$  (d)  $x = 4, y = 2, z = 0$  or  $x = 2, y = -4, z = 0$

6. A matrix  $A = [a_{ij}]_{m \times n}$  is called scalar matrix if :

- (a)  $a_{ij} = 0$  if  $i \neq j$ . and  $a_{ij} = k, i = j$ . (b) where  $a_{ij} \neq 0$  if  $i \neq j$ . and  $a_{ij} = k, i = j$ .  
(c)  $m \neq n, a_{ij} = 0$  if  $i \neq j$ . and  $a_{ij} = k, i = j$ . (d)  $m = n, a_{ij} = 0$  if  $i \neq j$ . and  $a_{ij} = k, i = j$ .

7. If  $\begin{bmatrix} 1 & 2 \\ -2 & -b \end{bmatrix} + \begin{bmatrix} a & 4 \\ 3 & 2 \end{bmatrix} = \begin{bmatrix} 5 & 6 \\ 1 & 0 \end{bmatrix}$ , then  $a^2 + b^2 =$

- (a) 12 (b) 21  
(c) 20 (d) 22

8. If  $3A - B = \begin{bmatrix} 5 & 0 \\ 1 & 1 \end{bmatrix}$  and  $B = \begin{bmatrix} 4 & 3 \\ 2 & 5 \end{bmatrix}$ , then the matrix A =

- (a)  $\begin{bmatrix} 3 & -1 \\ 1 & 2 \end{bmatrix}$  (b)  $\begin{bmatrix} 3 & 1 \\ 1 & 2 \end{bmatrix}$   
(c)  $\begin{bmatrix} -3 & 1 \\ -1 & 2 \end{bmatrix}$  (d)  $\begin{bmatrix} 3 & -1 \\ 1 & -2 \end{bmatrix}$

9. If A is a square matrix such that  $A^2 = A$ , then the simplified value of  $(I - A)^3 + A$  is equal to

- (a) A (b)  $A^2$   
(c) I (d)  $A^3$

10. If A is a square matrix such that  $A^2 = A$ , then the simplified value of  $(A - I)^3 + (A + I)^3 - 7A$  is equal to

- (a) A (b)  $A^3$   
(c) 3A (d) I

**DIFFERENTIABILITY**  
**Competency based questions [MCQ ]**

1.  $\frac{d}{dx} [\sin^2(\sqrt{\cos x})] =$

(a)  $-\frac{2 \sin x \cdot \sin(\sqrt{\cos x}) \cdot \cos(\sqrt{\cos x})}{2(\sqrt{\cos x})}$

(b)  $-\frac{2 \cdot \sin(\sqrt{\cos x}) \cdot \cos(\sqrt{\cos x})}{2(\sqrt{\cos x})}$

(c)  $-\frac{2 \sin x \cdot \sin(\sqrt{\cos x})}{2(\sqrt{\cos x})}$

(d)  $-\frac{2 \sin x \cdot \sin(\sqrt{\cos x}) \cdot \cos(\sqrt{\cos x})}{2}$

2.  $\frac{d}{dx} [\log \sin \sqrt{x^2 + 1}] =$

(a)  $\frac{2x \cos \sqrt{x^2 + 1}}{\sqrt{x^2 + 1} \cdot \sin \sqrt{x^2 + 1}}$

(b)  $\frac{x \cos \sqrt{x^2 + 1}}{2\sqrt{x^2 + 1} \cdot \sin \sqrt{x^2 + 1}}$

(c)  $\frac{\cos \sqrt{x^2 + 1}}{2\sqrt{x^2 + 1} \cdot \sin \sqrt{x^2 + 1}}$

(d)  $\frac{x \cos \sqrt{x^2 + 1}}{\sqrt{x^2 + 1} \cdot \sin \sqrt{x^2 + 1}}$

3.  $\frac{d}{dx} [2^{-x}] =$

(a)  $\frac{1}{2^x} \log 2$

(b)  $-\frac{1}{2^x} \log 2$

(c)  $2^x \log 2$

(d)  $-\frac{x}{2^{x+1}}$

4.  $\frac{d}{dx} [e^{1 + \log_e x}] =$

(a) 1

(b) 0

(c)  $x \cdot \log_e x$

(d) e

5.  $\frac{d}{dx} [2^{\cos^2 x}] =$

(a)  $2^{\cos^2 x} \cdot \sin 2x$

(b)  $-2^{\cos^2 x} \cdot \log 2 \cdot \sin 2x$

(c)  $2^{\cos^2 x} \cdot \log 2 \cdot \sin 2x$

(d)  $-2^{\cos^2 x} \cdot \sin^2 x$

6.  $\frac{d}{dx} \left[ \log_e \tan \left( \frac{\pi}{4} + \frac{x}{2} \right) \right] =$

(a)  $\sec x$

(b)  $\tan x$

(c)  $\sec x \cdot \tan x$

(d)  $\sec^2 x$

$$7. \frac{d}{dx} \left[ \tan^{-1} \left( \frac{\sqrt{1+x^2}-1}{x} \right) \right] =$$

(a)  $\frac{\sqrt{1+x^2}}{x}$

(b)  $\frac{1}{(1+x^2)}$

(c)  $\frac{x}{\sqrt{1+x^2}-1}$

(d)  $\frac{1}{2(1+x^2)}$

$$8. \frac{d}{dx} \left[ \sin^{-1} \left( \frac{1}{\sqrt{1+x^2}} \right) \right] =$$

(a)  $\frac{1}{1+x^2}$

(b)  $-\frac{x}{1+x^2}$

(c)  $-\frac{1}{1+x^2}$

(d)  $-\frac{2x}{1+x^2}$

$$9. \frac{d}{dx} \left[ \tan^{-1} \left( \sqrt{\frac{1+\sin x}{1-\sin x}} \right) \right] = \quad \text{where } 0 < x < \frac{\pi}{4}$$

(a)  $-\frac{1}{2}$

(b)  $\frac{1}{2}$

(c)  $\frac{1+\sin x}{1-\sin x}$

(d)  $\frac{1-\sin x}{1+\sin x}$

$$10. \frac{d}{dx} \left[ \sin^{-1} \left( \frac{\sin x + \cos x}{\sqrt{2}} \right) \right] =$$

(a)  $\frac{1}{\sqrt{2}}$

(b)  $\sqrt{2}$

(c) 1

(d)  $-\sqrt{2}$

$$11. \frac{d}{dx} [x^{\sin x}] =$$

(a)  $x^{\sin x} \left( \cos x + \frac{\sin x}{x} \right)$

(b)  $x^{\sin x - 1} \cdot \cos x$

(c)  $x^{\sin x} (\cos x \cdot \log_e x + \sin x)$

(d)  $x^{\sin x} \left( \cos x \cdot \log_e x + \frac{\sin x}{x} \right)$

$$12. \text{ If } (\cos x)^y = (\sin y)^x, \text{ then } \frac{dy}{dx} =$$

(a)  $\frac{\log \sin y + y \tan x}{(\log \cos x - x \cot y)}$

(b)  $\frac{\log \sin y + \tan x}{(\log \cos x - x \cot y)}$

(c)  $\frac{\log \sin y + y \tan x}{(\log \cos x + x \cot y)}$

(d)  $\frac{\log \sin y + y \tan x}{(\log \cos x - \cot y)}$

13. If  $y^x = e^{y-x}$ , then  $\frac{dy}{dx} =$ .

(a)  $\frac{y^x}{\log y}$

(b)  $\frac{\log y}{(1 + \log y)^2}$

(c)  $\frac{(1 + \log y)^2}{\log y}$

(d)  $\frac{1}{\log y \cdot (1 + \log y)^2}$

14.  $\frac{d}{dx} [x^{x^x}] =$

(a)  $x^{x^x} \cdot x^{x-1}$

(b)  $x^{x^{x-1}}$

(c)  $x^{x^x} \cdot x^x [(1 + \log x) \log x]$

(d)  $x^{x^x} \cdot x^x [(1 + \log x) \log x + \frac{1}{x}]$

15. If  $x = a(\theta - \sin \theta)$ ,  $y = a(1 + \cos \theta)$ , then  $\frac{d^2y}{dx^2}$  at  $\theta = \frac{\pi}{2}$  is equal to

(a)  $a$

(b)  $\frac{1}{a}$

(c)  $\frac{1}{2a}$

(d)  $\frac{2}{a}$

16. If  $y = \sqrt{x + \sqrt{x + \sqrt{x + \dots \infty}}}$ , then  $\frac{dy}{dx} =$

(a)  $\frac{1}{2y-1}$

(b)  $\frac{1}{2y+1}$

(c)  $\frac{1}{1-2y}$

(d)  $\frac{2}{2y-1}$

17. If  $y = \sqrt{\cos x + \sqrt{\cos x + \sqrt{\cos x + \dots \infty}}}$ , then  $\frac{dy}{dx} =$

(a)  $\frac{\cos x}{1-2y}$

(b)  $\frac{\sin x}{1+2y}$

(c)  $\frac{\sin x}{1-2y}$

(d)  $\frac{\cos x}{1-2y}$

18. If  $y = (x + \sqrt{x^2 + a^2})^n$ , then  $\frac{dy}{dx} =$

(a)  $\frac{y}{n\sqrt{x^2 + a^2}}$

(b)  $\frac{ny}{\sqrt{x^2 + a^2}}$

(c)  $2nx(x + \sqrt{x^2 + a^2})^{n-1}$

(d)  $\frac{y}{\sqrt{x^2 + a^2}}$

19. If  $x = a(\cos t + t \sin t)$  and  $y = a(\sin t - t \cos t)$ ,  $0 < t < \frac{\pi}{2}$ , then  $\frac{d^2x}{dt^2} =$

(a)  $a(\cos t - t \sin t)$

(b)  $at \sin t$

(c)  $t \sin t$

(d)  $a(\cos t + t \sin t)$

20. If  $y = a \cos(\log x) + b \sin(\log x)$ , then

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

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

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

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

21. If  $x^m \cdot y^n = (x + y)^{m+n}$ , then  $\frac{dy}{dx} =$

(a)  $-\frac{y}{x}$

(b)  $\frac{2y}{x}$

(c)  $\frac{x}{y}$

(d)  $\frac{y}{x}$

22. If  $y = A \cos nx + B \sin nx$ , then

(a)  $\frac{d^2y}{dx^2} - n^2y = 0$

(b)  $\frac{d^2y}{dx^2} + n^2y = 0$

(c)  $\frac{d^2y}{dx^2} + y = 0$

(d)  $\frac{d^2y}{dx^2} = n^2y^2$

**NOTE : UT-2 Syllabus – Chapter 1,2,5**

## SUBJECT – INFORMATICS PRACTICES

Q1. What do you mean by Pandas in Python?

Q2. What do you mean by Series in Python?

Q3. Name a method which is used to create Series in Python. Explain all the parameters of the Series function.

Q4. Write a program in Python to create a series of first five even numbers.

Q5. Write a program in Python to create a Series in Python from the given dictionary.

```
D = {"Jan": 31, "Feb": 28, "Mar": 31}
```

Q6. Write the output of the following :

```
import pandas as pd
S1 = pd.Series(range(1,15,3), index=[x for x in "super"])
print(S1)
```

Q7. Name any two attributes of Series in Python.

Q8. Write the output of the following :

```
import pandas as pd
L1 = list("My name is Ravi Kumar")
S1 = pd.Series(L1)
print(S1[0])
print(S1[5])
```

Q9. Complete the code to get the required output :

```
import _____ as pd
_____ = pd.Series([31, 28, 31], index = ["Jan", "Feb", "Mar"] )
print(S1["_____"])
```

OUTPUT :

28

Q10. Write a program to modify the value 5000 to 7000 in the following Series "S1"

A 25000

B 12000

C 8000

D 5000

Q11 Write the output of the following code :

```
import pandas as pd
S1 = pd.Series([2, 5, 7, 10])
print(S1 + 2)
print(S1 * 2)
print(S1 ** 2)
print(S1 - 2)
print(S1 > 2)
```

Q12. Write a program to display the following Series "S1" in descending order.

0 300

1 100

2 1200

3 1700

Q13. Write a program to display multiple of 5 from the given Pandas Series.

0 15

1 2

2 8

3 4

4 1

5 25

6 30

Q14. Differentiate between Pandas Series and NumPy Arrays.

### Data Series

Q.1 What is Series?

Q2. Create a Series using List.

Q3. Create Series using a NumPy Array.

### Data Frame

Q.1 Which method is used to make a DataFrame?

Q.2 Write the syntax of DataFrame method.

Q.3 Is series is a one-dimensional array which is labelled and can hold any data type?

Q.4 Which function allows us to manipulate data and create new variables in pandas library?

Q.5 Which function is used to read the dataset from a large text file?

Q.6 Are DataFrames container for Series?

Q.7 Data structures in Pandas can be mutated in the terms of \_\_\_\_ but not of \_\_\_\_\_.

Q.8 Explain Series in pandas. How to Create Copy of Series In pandas?

Q.9 Define Python pandas

Q.10 Mention the Different Types of Data Structures in pandas?

Q.11 What is a pandas DataFrame? How we can create an Empty DataFrame In pandas?

Q.12 Explain Reindexing in pandas.

Q.13 Write the name of methods used with series with their purpose

Q.14 Write the name of methods used with DataFrame with their purpose

Q.15 How can we calculate the standard deviation from the Series?

Q.16 Create a Series using List and Dictionary.

Q.17 Create series using NumPy functions.

Q.18 Get index and values of a series.

Q.19 Rename DataFrame Columns.

Q.20 Filter DataFrame rows using isin.

Q.21 Drop DataFrame Column(s) by Name or Index.

Q.22 Add new column to DataFrame.

Q.23 Get list of the column headers.

Q.24 Generate DataFrame with random values.

Q.25 Select multiple columns from DataFrame.

Q.26 Convert Dictionary into DataFrame.

Q.27 Check that DataFrame is empty.

Q.28 Slice DataFrame using loc .

Q.29 Differentiate loc vs iloc slicing in DataFrame.

Q.30 Add row at end of DataFrame.

Q.31 Get mean(average) of rows and columns of DataFrame .

Q.32 Calculate sum across rows and columns.

Q.33 Delete missing data rows from DataFrame

Q.34 Write python program to find minimum and maximum values of DataFrame

Q.35 Find index position of minimum and maximum values

**Board Practical File Program**

<b>1</b>	Create a panda's series from a dictionary of values and a ndarray
<b>2</b>	Given a Series, print all the elements that are above the 75th percentile
<b>3</b>	Create a Data Frame quarterly sales where each row contains the item category, item name and expenditure. Group the rows by the category and print the total expenditure per category.
<b>4</b>	Create a data frame for examination result and display row labels, column labels data types of each column and the dimensions
<b>5</b>	Given the school result data, analyses the performance of the students on different parameters, e.g subject wise or class wise.
<b>6</b>	For the Data frames created above, analyze, and plot appropriate charts with title and legend
	Complete above practical program on system and send mail on <a href="mailto:chanchalsachdeva2020@gmail.com">chanchalsachdeva2020@gmail.com</a>

Note: Revise chapter 1 and chapter 2 ,Do the practice of example that s given in Book.

**UT 2 SYLLABUS**

1. Python Pandas – I
2. Python Pandas – II



## **SUBJECT-PHYSICAL EDUCATION**

### **A.PRACTICAL FILE WORK**

#### **Suggest topics**

- Test for CWSN (any 4 items out of 27 items. One item from each component: Aerobic Function, Body Composition, Muscular strength & Endurance, Range of Motion or Flexibility)
- CWSN (Children With Special Needs – Divyang): Bocce/Boccia , Sitting Volleyball, Wheel Chair Basketball, Unified Badminton, Unified Basketball, Unified Football, Blind Cricket, Goal ball, Floor ball, Wheel Chair Races and Throws, or any other Sport/Game of choice
- Children with Special Needs can also opt any one Sport/Game from the list as alternative to Yogic Practices. However, the Sport/Game must be different from Test - 'Proficiency in Games and Sports'

#### **\*Record Practical File shall include:**

- 1: Fitness tests administration. (SAI Khelo India Fitness Test)
- 2: Procedure for Asanas, Benefits & Contraindication for any two Asanas for each lifestyle disease. (Obesity, Diabetes, Asthma, Hypertension, Blood Pressure)
- 3: Measurement for any one IOA recognized Sport/Game of choice.

Labelled Diagram of Field & Equipment. Also, mention its Rules, Terminologies & Skills.

Including games: Basketball, Football, Handball, Hockey, Cricket, Kabaddi, Kho-Kho, Volleyball

#### **Guidelines:**

1. The Practical file should be clean and covered by light blue sheet.
2. Practical file should be prepare individually in legible handwriting.
3. Practical file should not be less than 30 pages
4. Students should prepare the practical on the topics allotted. It is as follows:

**B. Make proper notes of the chapter 2 and 3**

**C. Revise all the chapter completed till may**

### **D. UT-2 SYLLABUS**

**Chapter-3 &4**

## SUBJECT-PAINTING

### a) Folk art on canvas.

