

ENGLISH

Date of submission: 16th June,2023.

General Instructions:

1. Read the newspaper daily with special emphasis on school-based reports, advertisements, posters and articles. Pay attention to the language used.
2. All sections are compulsory for all except creative corner which is allotted roll no. wise.

READING COMPREHENSION

(To be done in the English Register)

A. Read the passage given below:

1. In the recent past, there has been a thought given to the several problems that the system of school education is facing. Starting with focus on the Delhi region, one of the first discussion points has been to find ways to bring the lakhs of children who have so far been denied education into a workable school system. A further aspect of the same problem is to ensure minimum dropout rate in school children (particularly girls). In Delhi, this has reached alarming proportions. Finding solutions for Delhi will help other areas as well.

2. A tool called ‘learning style inventory’ was used; it addressed to know how information of skills are learnt, which factor makes an individual comfortable with learning skills or acquiring declarative knowledge. Different answers emerged. In dealing with factual knowledge some people liked to experience first, others to observe, yet others to experiment and still some who preferred to plunge into learning, leaving analysis for later.

3. It then became easy to discover which of the attributes made for better learning for an individual. The learning situation will benefit by understanding these differences. Two major processes cover most people’s learning styles. These are as follows: Information gathering process and process of transforming information. The continuance of information gathering is bound by people who gather information through experiences at one end and by those who gather information through reading/listening, on the other. The continuance of transformation of information is bound by people who internalise through watching/observing, on the one hand, and by those who learn while applying knowledge and doing something with it, on the other. Others fall somewhere in between. All this has a bearing at school because children too have similar learning styles on these two axes.

4. There are four types of learners. Firstly, there are children who will absorb facts through experiences. They will readily share their thoughts with others. The second type of learners

will take unrelated facts and try to seek order in them in using independent judgement. They will prefer to be exact in their knowledge and correctly apply as per their understanding. The next type of learner is the pragmatist. They use their abilities to problem solving. Such person – is a useful type to function in a group. The fourth type of learner belongs to the world of action. Everything is brought down to the level of concrete observation and doing.

5. With some awareness of how children react in different ways, teachers may find effective methods of teaching. The psyche of each child depends upon one's background and upbringing. Devising innumerable ways of identifying and resolving acute problems faced by a learner then, becomes the sole responsibility of the school, especially educators. Dealing with the profound inquisitiveness also forms the basis of all education.

1.1. On the basis of your understanding of the above passage, answer the given question by choosing the correct option:

- i. Mention two major problems that the system of school education is facing.
 - a. Enrolling children in school, promoting girls' education.
 - b. Preventing dropping out, providing text books.
 - c. Enrolling children, preventing dropping out.
 - d. Providing school buildings, giving textbooks.

- ii. What are the two main uses of learning style inventory?
 - a. to know how information of skills are learnt and which factors lead to learning comfortably.
 - b. factual knowledge and experience.
 - c. analysis and observation.
 - d. experiment and hands-on learning.

- iii. Information can be gathered
 - a. through experience, reading and listening.
 - b. through applying knowledge.
 - c. through observing.
 - d. through doing something with knowledge.

- iv. Which type of a learner falls a prey to judgements using chronology of thoughts?
 - a. First
 - b. Second
 - c. Third
 - d. Fourth

- v. Select the suitable option for the given statements:
 - (1) 'Learning style inventory' is addressed to know how information of skills is learnt.
 - (2) The pragmatist type of learners are not capable of problem-solving.
 - a. (1) is false but (2) is true.

- b. Both (1) and (2) are true.
 - c. Both (1) and (2) are false.
 - d. (2) is false but (1) is true.
- vi. Factual in paragraph 2 is the opposite of
- a. based on experience.
 - b. told by knowledgeable people.
 - c. fanciful.
 - d. found in books.

1.2. Answer the given questions in 20-30 words

- vii. The continuance of gathering of information is bound by _____
- viii. 'Such person is-a useful type to function in a group'. Which attributes of a learner can be inferred from this statement?
- ix. Which word in the passage means same as 'to absorb an attitude'? (Para 3)
- x. What should be the approach of schools while dealing with individual difference in children?

B. Read the passage given below and answer the questions that follow:

1. The Mayan civilization of Mexico and Central America are one of the ancient world's most fascinating, prolific, and mysterious civilisations. They left their mark on the region's culture, architecture, cuisine, and language – and left an indelible impression on the imagination of the modern world. Who were they? How were they able to build such an impressive civilisation of towering temples and sophisticated artwork in the middle of the harsh rainforests of Mesoamerica? And why did they vanish?

2. The earliest Mayans lived along the Pacific coast of what is now Guatemala and can be dated to about 1800 BC; by 1000 BC they were also living in Guatemala's southern lowlands. The period from about 1800 BC to about AD 250 is referred to as the Pre – classic, a time when the early Mayans lived as farmers in small villages along rivers and other bodies of water, hunting game, tending gardens and making use of the abundant natural foods found in the region's marshes and seasonal swamps. In time, strong rulers began wielding power over these communities, and the Mayan culture grew in complexity. Cities rose from the forest floor, boasting stone temples with stuccoed and painted facades created at the behest of elite rulers. People in the new power centres communicated over long distances, and traders using the same routes carried luxury goods such as cacao beans, jade ornaments, quetzal feathers, and jaguar pelts.

3. The Classic period, AD 250 – 900, is the time of the civilisation's greatest glory – and of the greatest depths of political intrigue between rival cities. During these centuries, the Mayans erected countless stelae, stone monuments inscribed with portraits and hieroglyphs that recorded dynastic histories – the births, marriages and conquests of the ruling families. There were dozens of important regional capitals at the time, and among the most important were

Tikal in Guatemala and its fierce rival Calakmul in Mexico, Palenque in southern Mexico, Caracol in Belize, and Copán in Honduras.

4. The Classic period is known for artistic and intellectual splendour. The Mayans developed a complex religious and ritual system that considered rulers divine beings and called for blood sacrifices. They also grasped the numerical notion of zero, created agricultural timetables and sophisticated calendars to track the heavens, and made beautiful polychrome pottery as well as exquisite ornaments, murals, and carved decorations.

5. But the Classic Mayans were also known for their rancorous political fighting and for being extremely bellicose – warfare was always on the horizon. One by one, the cities in the southern Mayan lowlands fell to each other, their downfall often recorded on stelae in the conquering city. By AD 900 most of the important Classic period cities had collapsed, and their remaining populations had scattered into the surrounding forests. The last date recorded on stelae that archaeologists have found so far is from 909 in Toniná, in southern Mexico. Among the factors that help explain why the civilisation collapsed were the endemic warfare, overpopulation, degradation of the environment, and drastic climate change and drought.

6. While the cities and ceremonial centres of the southern lowlands were being reclaimed by the jungle, the Mayans living to the north were gaining prominence, rising to amazing heights during the post-classic period (900 – 1502). Wonderful and wealthy cities in Mexico’s Yucatán Peninsula flourished, most famous among them being Chichén Itzá. Yet it too fell victim to political infighting and by 1200 had collapsed.

7. “The Mayans never truly disappeared. Centuries after the major cities were abandoned, small groups of Mayans continued to live in the area. It was they who met and resisted the Spanish conquistadors after the first contact, in 1502. And today, more than six million Mayans live in Mexico, Guatemala, and Belize, speaking 28 languages, and blending ancient and modern ways.

(a) On the basis of your understanding of the above passage, make notes on it using headings and subheadings. Use recognizable abbreviations (wherever necessary- minimum four) and a format you consider suitable. Also supply an appropriate title to it.

(b) Write a summary of the passage in about 80 words.

CREATIVE CORNER

➤ Questionnaire Making (Roll Nos 1-10)

How to do: Prepare 10 multiple choice questions each from the following stories. The questions must test high order thinking skills wherein all the components of the chapter must be included ranging from narrative style, characters, moral, literary devices etc:

- a) *A Portrait of a Lady*
b) *The Summer of a Beautiful White Horse*

Where to do: A-4 size sheets

Parameters: accuracy, content, authentication

➤ **Script Writing (Roll Nos 11-20)**

How to do: Write a script on any **SOCIAL ISSUE** of the prevailing times. It should be divided into a minimum of two scenes involving the conflict and its resolution. The names of the characters should be written on a different page along with themes and moral.

Where to do: A-4 size sheets

Parameters: content, presentation, setting of a plot

➤ **Creation with Proverb (Roll Nos 21-30)**

How to do: Describe any one of the following proverbs in your own words and portray in the form of a story, poem or a paragraph enumerating its meaning and application in routine life. You should also add pictures to make it creative.

- ‘The pen is mightier than the sword’
- ‘No pain No gain’
- ‘All’s well that ends well’

Where to do: A-3 size sheet

Parameters: creativity, relevance, presentation

➤ **Rock the Blog (Roll Nos 31-40)**

How to do: Create a blog of your own showcasing your love for English language sharing your experiences and the challenges posed by the language on a global platform.

Where to do: Pen drive

Parameters: creativity, content, presentation

➤ **Being innovative with values (Roll Nos 41-50)**

How to do: Create your own diary in which you will write daily about any one positive change which you will bring in yourself like being organized or being punctual etc. (80-100 words)

Where to do: An A-4 size handmade diary which should be properly decorated.

Parameters: creativity, content, authentication

Grammar and Writing Skills (To be done in the English Register)

- a. Fill in the blanks with the correct form of the verb given in brackets.

A newspaper recently (a) _____ a report of a man in search of his newly born twin. The babies were missing at hospital where his wife (b) _____ birth to them. The hospital authorities claimed that the babies (c) _____ but they refused to hand over their bodies. Now, the unfortunate father (d) _____ a complaint with the police.

- b. Rearrange the following words or phrases to make meaningful sentences.

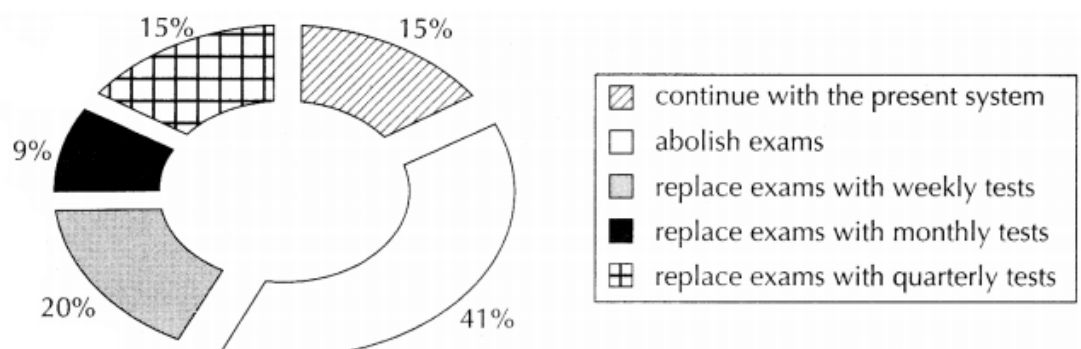
- i. to / the popularity / every corner / junk food / has led / of eating / joints / around / of / the / opening
- ii. believed in / people of India / the sacredness of / have traditionally / wildlife
- iii. the / sparrow / from / city / it / disappeared / house / has / seems / common / the / that
- iv. holidays / their / children / this / the / is / refrain / hear / during.
- v. one / since / in / summer / worse / are / things / play / cannot / sun / in / the
- vi. hands / condemned / en / their / the / to / indoors/ a lot of time
- vii. are / of amusement / a / sleep walkers / source / other / to / people
- viii. for / sleep / walkers / anxiety / source of / are / a / but / families / their

- c. Tourism Department, Government of Andaman and Nicobar Islands has launched an ambitious plan to develop adventure sports and eco-tourism activities in the state. Prepare a suitable poster for display at important public places /publication in newspapers using creative slogans.

- d. In today's age of stress and anxiety, the children need to understand the importance of sleep, meditation and yoga over social networking and the use of the cell phone. Write an article of 120 words on 'Concentration and Composure', the need of the hour.

- e. A survey was conducted by students of Sacred Heart Convent School regarding the importance of examinations. Given below are their findings.

Based on the information given below, ideas and your ideas, write a paragraph on the topic: 'Examinations Should Be Abolished' within 120 words.



Literature (To be done in the English Register)

A. Answer the following questions in 40-50 words each.

- The grandmother's reception and send-off of her grandson was very touching. Comment.
- How is the poem 'A Photograph' an elegy?
- What do you think induced the boys to return the horse to its owner?

B. Answer the following questions in 120-150 words each.

- Gradually the author and the grandmother saw less of each other and their friendship was broken. Was the distancing deliberate or due to the demands of the situation? Elaborate.
- The narrator mentioned 'a crazy streak' running in his family. Which two characters showed this streak in their behaviour and words? Write briefly about them showing how they could be called crazy.
- The sea 'appeared to have changed less' in comparison to the three girls who enjoyed the sea holiday. Comment.

ECONOMICS

Date of submission: 16th June,2023

ASSIGNMENT (CASE STUDY & NUMERICALS IN ECONOMICS)

To be done in Economics Register.

MICROECONOMICS

CHAPTER 1

1. Read the given case carefully and answer the following questions based on the same.

The resources that we value—time, money, labour, tools, land, and raw materials—exist in limited supply. There are simply never enough resources to meet all our needs and desires. This condition is known as scarcity.

At any moment of time, there is a finite number of resources available. Even when the number of resources is very large, it's limited. Because these resources are limited, so are the numbers of goods and services we can produce with them. Combine this with the fact that human wants seem to be virtually infinite, and you can see why scarcity is a problem. When faced with limited resources, we must make choices. Again, economics is the study of how humans make choices under conditions of scarcity. These decisions can be made by individuals, families, businesses, or societies.

- (i) Short supply in relation to demand is called _____.
 - a. Abundance
 - b. Scarcity
 - c. Both (a) and (b)
 - d. None of these
- (ii) Scarcity is the mother of all _____ problems.
- (iii) Which of the country does not have scarcity of resources?
 - a. America
 - b. India
 - c. China
 - d. None of these
- (iv) Which of the following factors cause economic problem?
 - a. Limited resources
 - b. Unlimited wants
 - c. Alternative use of resources
 - d. All of the above

2. Read the given case carefully and answer the following questions based on the same.

Microeconomics can be regarded as the study of decisions that people and businesses make in terms of allocation of resources including land, labour, capital and price of goods and services. Microeconomics mainly focuses on supply and demand and other forces that determine the price levels prevalent in the economy.

Macroeconomics, on the other hand, is the field of economics that studies the behaviour of the economy as a whole and not just on specific company or individuals, but the entire industries and economies.

This looks at wider phenomena, such as Gross National Product (GNP) and how it is affected by changes of unemployment, national income, rate of growth, and price levels.

For example, macroeconomics would look at how an increase or decrease in net exports would affect a nation's capital account or how GNP would be affected by such indexes like unemployment rate. The summed up inference is that microeconomics takes a wholesome approach to analysing the

economy while macroeconomics takes a superficial approach.

- (i) _____ (Micro/Macro) economics studies the decision of people related to allocation of resources.
- (ii) Which of the following is the example of macro-economics?
 - a. National Income
 - b. Population Growth
 - c. Unemployment
 - d. All of these
- (iii) Decrease in exports of a country is an example of _____ economics.
- (iv) Price theory is studied under _____ branch of economics.

Numerical Questions

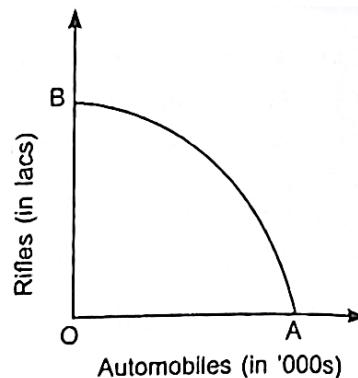
3. A country produces only two goods: green chilli and sugar. Its production possibilities are shown in the following table. Plot the PPC on a graph paper and verify that it is concave to the origin. What is the pattern in the table that gives rise to the concave shape of the PPC?

Possibilities	A	B	C	D	E	F
Sugar	0	1	2	3	4	5
Green Chilli	100	95	85	70	50	25

4. The following is a production possibility table for war goods and civilian goods:

Combinations	A	B	C	D	E
Automobiles (₹ 000s)	0	1	2	3	4
Rifles (lacs)	10	9	7	4	0

- (a) Show these production possibilities through a PPC. What do the points on the curve indicate?
 - (b) Label point G inside the curve. What does this point indicate?
 - (c) Label point H outside the curve. What does this point indicate?
 - (d) What must an economy do to attain the level of production indicated by point H?
5. Given the production possibilities curve for rifles and automobiles:



- (i) Suppose improvement occurs in the technology of producing rifles and not in the production of automobiles. Draw the new PPC.
- (ii) Now, assume that a technological advance occurs in producing automobiles and not in producing rifles. Draw the new PPC.
- (iii) Finally, draw a PPC which reflects technological improvements in the production of both products.

CHAPTER 2

1. Read the given case carefully and answer the following questions based on the same.

We defined demand as the amount of some product that a consumer is willing and able to purchase at each price. This suggests at least two factors, in addition to price, that affect demand. ‘Willingness to purchase’ suggests a desire to buy, and it depends on what economists call tastes and preferences. If you neither need nor want something, you won’t be willing to buy it. ‘Ability to purchase’ suggests that income is important. The price of related goods can also affect demand. If you need a new car, for example, the price of a Honda may affect your demand for a Ford. Finally, the size or composition of the population can affect demand. The more children a family has, the greater is their demand for clothing. The more driving-age children a family has, the greater is their demand for car insurance and the less is their demand for diapers and baby formula.

- (i) Which of the following is an element of demand?
 - a. Willingness to purchase
 - b. Ability to purchase at a given price
 - c. Both (i) and (ii)
 - d. None of these
- (ii) ‘Willingness to purchase’ depends upon _____ (taste and preferences/ income) of the consumer.
- (iii) ‘Ability to purchase’ depends upon _____.
 - a. taste
 - b. income
 - c. preference
 - d. All of these
- (iv) Which of the following is not the factor that affects demand?
 - a. Price of related goods
 - b. Income of a consumer
 - c. Price of given good

d. None of these

2. Read the given passage and answer the questions that follow.

The quantity of a commodity that a consumer is willing to buy and is able to afford, given prices of other goods and consumer’s income and his tastes and preferences is called ‘demand’ for the commodity. The relation between the consumer’s optimal choice of the quantity of a good and its price is very important and this relation is called the ‘Demand function’. The demand function can also be represented graphically as the ‘demand curve’. The demand curve is a relation between the quantity of the good chosen by a consumer and the price of the good. It gives the quantity demanded of the given good by the consumer at each price.

The slope of the demand curve measures the rate at which quantity demanded changes w.r.t. its price. It is estimated as $-\frac{\Delta p}{\Delta q}$. Slope is the rate at which demand curve slopes downwards.

- (i) Elaborate the concept of “Demand function”.
- (ii) What do you understand by the ‘Slope of the demand curve’?
- (iii) What does the negative (–) sign in the above formula indicate?

Numerical Questions

3. A person’s total utility schedule is given below. Derive his marginal utility schedule

Amount consumed	0	1	2	3	4	5
Total Utility (Units)	0	10	25	38	48	55

4. Complete the following table:

Units Consumed	1	2	3	4	5
Total Utility	25	45	—	70	75
Marginal Utility	25	—	15	—	—

5. Given below is the utility schedule of a consumer for commodity X. The price of the commodity is ₹ 6 per unit. How many units should the consumer purchase to maximise satisfaction. Assume that the utility is expressed in utils. Give reasons for your answer.

Consumption (units)	1	2	3	4	5	6
TU (utils)	10	18	25	31	34	34
MU (utils)	10	8	7	6	3	0

6. A consumer consumes only two goods X and Y. Her money income is ₹ 24, and the prices of goods X and Y are ₹ 4 and ₹ 2 respectively. Answer the following questions.

- (i) Can the consumer afford a bundle 4X and 5Y? Explain.
- (ii) What will be the MRS_{XY} when the consumer is in equilibrium? Explain.

7. Complete the following indifference schedule of a consumer consuming bundles of two goods X and Y

Combination	Good X	Good Y	MRS_{XY}
A	1	15	—
B	2	—	4 : 1
C	—	8	3 : 1
D	4	6	—
E	5	—	1 : 1

8. The following table shows bundles (or combinations) along an indifference curve for two goods X and Y. Find the marginal rate of substitution (MRS) between X and Y for the following indifference curve.

Combination	Good X	Good Y	MRS _{XY}
A	1	15	—
B	2	11	—
C	3	8	—
D	4	6	—
E	5	5	—

9. Suppose a consumer whose income is ₹ 30 wants to consume two goods which are priced ₹ 5 each.
- Write down all the bundles that are available to the consumer.
 - Among the bundles that are available to the consumer, identify those which cost him exactly ₹ 30.
10. How does the budget line change if a consumer's income increases from ₹ 20 to ₹ 40 but the price remains unchanged?

STATISTICS FOR ECONOMICS

CHAPTER 1

1. Read the given case carefully and answer the following questions based on the same.

The word statistics refers either to quantitative information or to a method of dealing with quantitative information. In the first reference, it is used as a plural noun—"the statistics of births, deaths, imports, exports etc." In the second reference, the word is used as a singular noun—"statistics deals with the collection, presentation, analysis and interpretation of the quantitative information".

The methods by which statistical data are analysed are called statistical methods. Statistical methods are applicable to a very large number of fields like economics, business etc.

- Which of the following is true about statistics?
 - It refers to the quantitative Information.
 - It refers to the method of dealing with quantitative information.
 - Both (a) and (b)
 - None of the above
- Which of the following is the part of statistics in singular sense?
 - Collection of data
 - Presentation of data
 - Analysis of data
 - All of the above
- Statistical data help in economics in (policies/rules) formulation.

(iv) In plural sense, statistics means (polices/data).

2. Read the given case carefully and answer the following questions based on the same.

The notion of statistics was originally derived from the word "state". Since it has been the traditional function of governments to keep records of population, births and other kinds of things and activities.

Statistics means aggregates of facts affected to a marked extent by multiplicity of causes, numerically expressed, enumerated, or estimated according to reasonable standards of accuracy, collected in a systematic manner for a pre-determined purpose and placed in relation to each other.

(i) In above case study, 'state' refers to:

- a. People
- b. Government
- c. Both (a) and (b)
- d. None of the above

(ii) Which of the following is the characteristic of statistics?

- a. It is affected by multiplicity of causes.
- b. It can be quantitatively and qualitatively expressed.
- c. Both (a) and (b)
- d. None of the above

(iii) Income of person "X" is ₹ 1,00,000 per annum _____ (is/is not) statistics.

(iv) Statistics of production of rice is affected by rainfall, quality of soil etc., represents which characteristic of statistics?

- a. Aggregate of facts
- b. Multiplicity of causes
- c. Numerically expressed.
- d. All of the above

ACCOUNTANCY

Date of submission: **20th June 2023**

Solve the following assignment in your notebook:

- 1 AK Traders supplies raw materials to a business organization. Why will AK Traders interested in the accounting information of that business organization?
- 2 Accounting is not fully exact. Explain
- 3 What is meant by summarizing the financial information?
- 4 State any two qualitative characteristics of Accounting Information.
- 5 A Company suffered a loss of ₹15,000 in the business. Will this event be recorded in the books of Account?

- 6 What do you mean by accounting? Briefly explain any three advantages of accounting.
- 7 Explain the following terms:
 - a) Tangible Asset
 - b) Non- current liability
 - c) Bad Debts
- 8 Differentiate between book-keeping and accounting.
- 9 State the process of accounting process.
- 10 Differentiate between revenue expenditure and capital expenditure.

BUSINESS STUDIES

Date of submission: 22nd June 2023

Solve the following assignment in your notebook:

- 1 What are the objectives of the business?
- 2 What is Commerce and its significance in modern life?
- 3 How does a trader get rid of the hindrance of a person?
- 4 Insurance is known as the tertiary industry. Explain.
- 5 Define business risk. Explain its causes and sources.
- 6 Differentiate between Business, Profession and Employment on any five basis.
- 7 Even though there are limitations of size and resources, several people continue to prefer sole proprietorship compared to other forms of organisation? Why?
- 8 Compare the status of a minor in a Hindu joint family business with that in a partnership firm.
- 9 What is meant by “partner by estoppel”? Explain.
- 10 With a notable example, explain mutual agency in partnership.

MATHEMATICS

Complete the following assignment in your Mathematics notebook

Date of submission: 16th June 2023

1. Give an example of a 3 x 3 matrix which is
 - (a) Symmetric Matrix
 - (b) Skew-Symmetric Matrix
 - (c) Neither Symmetric nor Skew-Symmetric Matrix
 - (d) Symmetric as well as Skew-Symmetric Matrix
2. If $f(x) = \frac{1}{\sqrt{1-x^2}} \begin{bmatrix} 1 & -x \\ -x & 1 \end{bmatrix}$ then prove that $f(x).f(y) = f\left(\frac{x+y}{1+xy}\right)$. Hence show that $f(x).f(-x) = 1$, where $|x| < 1$.

3. If order of Matrix A be $m \times n$, then what will be the order of matrix B if
 (a) AB & BA both are defined
 (b) AB' & $B'A$ both are defined
4. Find the matrix A, if $\begin{pmatrix} 2 & -1 \\ 1 & 0 \\ -3 & 4 \end{pmatrix}A = \begin{pmatrix} -1 & -8 & -10 \\ 1 & -2 & -5 \\ 9 & 22 & 15 \end{pmatrix}$.
5. If $A = \begin{bmatrix} 2 & 0 & 1 \\ 2 & 1 & 3 \\ 1 & -1 & 0 \end{bmatrix}$ find $A^2 - 5A + 4I$ and hence find a matrix X such that $A^2 - 5A + 4I + X = O$
6. Prove that the function defined by $f : \mathbb{N} \rightarrow \mathbb{N}$ defined by $f(x) = x^2 + x + 1$ is one-one but not onto.
7. Prove that $\cos[\tan^{-1}\{\sin(\cot^{-1}x)\}] = \sqrt{\frac{1+x^2}{2+x^2}}$
- If $A = \begin{bmatrix} 2 & 3 \\ 5 & -2 \end{bmatrix}$ be such that $A^{-1} = kA$, then find the value of k.
9. If $A^{-1} = \begin{bmatrix} 1 & 2 \\ 3 & -1 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 3 \\ -1 & 1 \end{bmatrix}$, write the value of $\det(AB)$.
10. Find the values of x, y and z if $A = \begin{bmatrix} 0 & 2y & z \\ x & y & -z \\ x & -y & z \end{bmatrix}$ satisfies $A' = A^{-1}$
11. Differentiate: $\sin^2(x^2)$ w.r.t x^2 .
12. If $x = a\cos \theta + b\sin \theta, y = a\sin \theta - b\cos \theta$, show that $y^2 \cdot y'' - x \cdot y' + y = 0$.
13. If $(x - y) \cdot e^{\frac{x}{x-y}} = a$, prove that $y \cdot y' + x = 2y$.
14. If $x = a \sin 2t (1 + \cos 2t)$ and $y = b \cos 2t (1 - \cos 2t)$, find the values of dy/dx at $t = \pi/3$
 and $t = \pi/4$
15. If $x^m \cdot y^n = (x + y)^{m+n}$. then prove that $y'' = 0$
16. If $y = x^x$, then prove that $\frac{d^2y}{dx^2} \cdot \frac{1}{y} \cdot \left(\frac{dy}{dx}\right)^2 - \frac{y}{x} = 0$
17. If $y = \log(1 + t^2 + t^4)$ and $x = \tan^{-1} t$, find $\frac{d^2y}{dx^2}$
18. If $y = \frac{x \cos^{-1} x}{\sqrt{1-x^2}} - \log \sqrt{1-x^2}$ then prove that $y_1 = \frac{\cos^{-1} x}{(1-x^2)^{3/2}}$
19. If $x = a(\cos 2\theta + 2\theta \sin 2\theta)$ and $y = a(\sin 2\theta - 2\theta \cos 2\theta)$. Find $\frac{d^2y}{dx^2}$ at $\theta = \pi/8$

20. If $y = \sin(\sin x)$, prove that $y'' + \tan x \cdot y' + y \cdot \cos^2 x = 0$
21. Differentiate the function $(\sin x)^x + \sin^{-1} \sqrt{x}$ with respect to x .
22. If $y = \log(x + \sqrt{x^2 + a^2})$,
Then prove that $(x^2 + a^2)y_2 + x \cdot y_1 = 0$
23. Prove that the greatest integer function defined by $f(x) = [x]$, $0 < x < 3$ is not differentiable at $x=1$.
24. Let $A = \{1,2,3, \dots, 9\}$ and R be a relation on $A \times A$ defined by $R = \{(a, b): |a - b| \text{ is even}\}$ is an equivalence relation. Also find the equivalence class of 7.
25. If $f(x) = \begin{cases} \frac{\sin(a+1)x + 2\sin x}{x}, & x < 0 \\ 2, & x = 0 \\ \frac{\sqrt{1+bx}-1}{x}, & x > 0 \end{cases}$

PHYSICAL EDUCATION

Date of submission: 30th June 2023

I. To be done in Practical File

- Practical-1: Labelled diagram of 400 m Track & Field with computations.
- Practical-2: Describe Changing Trends in Sports & Games in terms of changes in Playing surface, Wearable gears, Equipment, Technological advancements.
- Practical-3: Labelled diagram of field & equipment of any one IOA recognised Sport/Game of choice.

II. Plan any sport during summer vacation and note the changes in body systems.

III. Visit any sports complex nearby and write about the game specific changes in infrastructure of different games.

IV. Complete the following assignment in your Register

1. Define Physical Education.
2. What are the objectives of Physical Education?
3. How Physical Education develop neuro-muscular coordination?
4. How can Physical Education contribute in moral and character building?
5. How does Physical Education contribute to an individual's development mental development?
6. What are advantages of using technology in sports?
7. What are the career options an individual has after completion of professional course in Physical Education?
8. What is khelo India Programme?
9. What is the need of sports competition in school? Discuss in details.



10. Apart from a professional degree in Physical Education, what other key skills are required for opting for career other than teaching?