SUMMER HOLIDAY HOME WORK

CLASS XII

Dear Students and Parents,

As the summer holidays approach, we encourage students to make the most of this valuable time. Here are some suggestions to help students stay productive, engaged, and refreshed during the break:

1. Reading: Cultivate a reading habit by exploring a variety of books and newspapers. Whether it's fiction, non-fiction, or educational material, reading enhances vocabulary, knowledge, and imagination.

2. Skill Development: Use this time to learn a new skill or hobby. This could include playing a musical instrument, cooking, painting, or learning a new language. Online courses , internships and workshops are excellent resources for this purpose.

3. Physical Activity: Stay active by engaging in sports, yoga, or simple exercises. Physical activity is crucial for maintaining health and can be a fun way to spend time with family and friends.

4. Volunteering: Consider volunteering for community service. This not only helps others but also provides a sense of fulfillment and teaches valuable life skills.

5. Time Management: Balance leisure with productive activities. Creating a daily schedule can help manage time effectively and ensure that each day is spent meaningfully.

6. Project Work: Start working on school projects or personal projects that interest you. This could be a science experiment, a writing project, or a DIY craft.

7. Family Time: Spend quality time with family. Engage in activities like board games, cooking together, or having meaningful conversations.

We hope these suggestions will help students utilize their summer holidays effectively, ensuring a balance of rest, learning, and fun.

Wishing everyone a safe, enjoyable, and productive summer break!

ENGLISH (301)

***Make a neat and clean project, Topics are given below:**
1.LAST LESSION (ROLL NO. 01-04)
2.THE THING OF BEAUTY (ROLL NO. 05-09)
3.MY MOTHER AT SIXTY-SIX (ROLL NO. 10- 14)
4.MEMORIES OF CHILDHOOD (ROLL NO. 15-18)
NOTE: Project File must contain:
•Front Page
•Acknowledgement
•Certificate
•Index
•About Author/ Poet (Introduction)
•Theme
•Central Idea
•Summary
•Conclusions
•Bibliography

ART INTEGRATION: 1.1.7.1.1. Use of contrast as an expressive element of Art
Theme: Languages, dress, food and culture of Arunachal Pradesh Prepare a file.
3.Read and collect the information about **'ROLE OF ENGLISH IN TODAY'S LIFE** and **CHILD LABOUR** write in your English literature notebook.

SECTION A READING SKILLS

Q1. Read the passage given below:

1. When we think of the game of cricket, we come to the conclusion that it is primarily a game that depends on outstanding physical activities, good hand-eye co-ordination, speed, skill and strength. It provides entertainment and generates strong feelings of excitement. A good match of cricket or of any other game neither adds to the existing stock of human knowledge nor reveals any secret existence. It does not carry any deep meaning but most people, particularly the lover of sports attach deep emotions and numerous meanings to it. Games are thought of as a metaphor for life. They are supposed to teach many lessons. In fact, more is said and written about a cricket match than about scientific findings or great philosophy.

2. This is because games, like a morality play, in which settings and rules are made by us, can easily make people test their fair and foul conduct principles of reward and punishment, and emotions of joy and disappointment. They can make us experience the thrill of war without exposing us to its dangers. A man watching a cricket match on TV and munching popcorn is like a surrogate warrior. In fact, games provide us with a safe outlet for our aggressiveness. If games become aggressive, they lose the very purpose of providing entertainment and purging us of our aggressiveness. They can calm our impatience without creating any conflict.

3. Commentators, journalists, politicians and analysts can do a great favour to the competing teams by keeping the excitement within limits. The teams should play without being dominated by feelings of national honour and shame. Excellent performance of the players of both teams should be enjoyed and appreciated.
Winning or losing in a game should not be taken seriously. A game is fun if it is played with true spirit of sportsmanship.

On the basis of your understanding of the above passage, answer the given questions by choosing the most appropriate option:

a) Complete the sentence by choosing an appropriate option:
Most people conclude that cricket is primarily a game because _____

(i) it is played as a match (ii) it requires two teams

(iii) it includes physical activity (iv) it depends only on skill and strength

b) Comment on the writer's reference to that cricket does not reveal any secret of existence.

c) List any two responses which watching a game of cricket gives rise to.

d) Select the option that conveys the opposite of 'destroy' from words used in the passage.
(i) reveals (ii) experience

(iii) generate (iv) purging

e) The writer would not agree with the given statements based on paragraph 2, EXCEPT
(i) Rules of any game are made by people .
(ii) Watching a cricket match makes the viewer believe that he is fighting a battle.
(iii) It is necessary for a game to be aggressive in order to build excitement.
(iv) A game can test people's sense of fair judgement.

f) With reference to the passage a spectator is compared to a surrogate warrior. Choose the option that best describes the phrase.

(i)a spectator who is paid to watch.

(ii)a spectator who is in pain while watching a match.

(iii)a spectator who enjoys the match as an armchair soldier.

(iv) a spectator who makes judgement about reward and punishment.

g) Why does the writer compare games to a morality play?

h) Complete the given sentence with an appropriate inference with respect to the following: The writer says that games can calm our impatience without creating any conflict by _____.
j) The writer advises the players that games should not become aggressive because

k) Select the most suitable title for the above passage.

(i) Excellent Performance by cricketers (ii) The Benefits of Playing Cricket
(iii) Cricket – The King of Games (iv) The True Spirit of Playing Games

Q2. Read the passage given below:-

(1) How bird hits happen, why they are a concern? New Delhi
June 20
At least two bird strike incidents happened on Sunday. Both aircrafts returned to their airports of origin and were grounded for maintenance. An ABC aircraft which took off from Guwahati towards Delhi, suffered damage

to its left engine following a bird hit at 1600 feet. The pilots returned to Guwahati. The other strike happened on another flight from Patna to Delhi. The pilots of the aircraft suspected a bird strike during the take-off roll but continued to climb. Following the take off rotation, they were informed by the cabin crew of sparks emanating from the left engine. Subsequently, the pilots were also informed by air traffic control of smoke coming out of one of the engines. The pilots declared an emergency and returned to Patna.

(2) Why are bird strikes a concern?

Bird strikes are among the most common threats to aircraft safety and they typically occur during take-off or landing. Dozens of bird strikes happen each day but some can be more dangerous than others. Typically, when birds collide with an aircraft's airframe, it is unlikely to cause significant problems for the pilots flying. But there are instances when the aircraft engine ingests the birds. This can lead to a loss of thrust for the engine and cause manoeuvrability problems for the crew. In these cases, where a jet engine ingests a bird, procedures would generally call for pilots to land the plane at the closest airport. While most airframe bird strikes are not considered critical to air safety, if a collision cracks a window or a wind-screen pilots will look to land as early as possible.

(3) How critical are bird strikes to air safety?

Smaller planes would generally be more susceptible to the dangers of bird strikes than larger ones. However, given that bird strikes mostly happen during take-off and landing, there incidents could distract the pilots during what are highly critical phases of flights that demand the complete attention of the crew.

(4) What causes bird-strikes?

The presence of birds around an aircraft increases the chances of a bird-strike. In the monsoon, as water puddles emerge on open grounds attracting insects to breed, the presence of birds increases. In some cases bird hits also happen at higher altitudes when a plane is cruising. These are more dangerous than the low-altitude hits, given that they can cause rapid depressurisation of cabins. Other reasons for bird activity around the air field could be presence of landfills or waste disposal. Other reasons for bird activity around the air field could be presence of landfills or waste disposal sites that can attract a large number of birds.

On the basis of your understanding of the above passage, answer the questions by choosing the most appropriate option:

a) Does the following statement agree with the information given in paragraph I?

When an airplane is hit by a bird or is suspected to have been hit, the passengers must be asked to get down at once.

Select from the following:

True:If the statement agrees with the information.

False: If the statement contradicts the information.

Not Given: If there is no information on this.

b) Select the option that displays the most likely reason for Bird hits.

(i) when the aircraft is overloaded.
(ii) at the time of landing or taking off.
(iii) when the crew becomes negligent.

(iv) when the passengers become panicky.

c) Complete the sentence appropriately with one word.

Smaller planes are generally more _____than the larger ones.

d) Complete the given sentence by selecting the most appropriate option: When the window on the windscreen of the air plane is cracked due to a bird hit _____

(i) the crew must rush to the cockpit.
(ii) the pilot must land at the earliest airport.
(iii) the pilot must inform the maintenance engineer.
(iv) the pilot should ignore them.

e) Based on the reading of the test, state a point to further the statement. Dozens of bird hits take place every day _____.

(i) but only a few are dangerous.
(ii) all of them are fatal.
(iii) but after every bird hit it is imperative to land the aircraft.
(iv) the pilot should ignore them.

f) Complete the sentence based on the following statement
Complete attention of the crew is demanded during take off and landing. We can say this because _____.

g) Complete the sentence appropriately with one/two words.
In cases where the aircraft engine infests the bird, it leads to the loss of thrust and causes problems in _____.

h) Which are the areas most prone to bird hits?

i) Based on the reading of the text, state a point to challenge the given statement. The area around air fields should be clear of any waste disposal sites.

j) Look at the graph. It shows that between 2016 and 2021 whereas air flights have come down, the bird-hits have gone up. This implies that the incidence of bird hits has _____.

(i)Decreased (ii) increased
(iii) remained constant (iv) been alarming

SECTION B <u>ADVANCED WRITING SKILLS</u>

Q5A.You have seen an advertisement in The Hindu for the post of P.G.T.(Psychology) for St. Mary's Convent, Feeder Road, Lucknow. Apply for the job with complete BIO-DATA. You are Sajeev Mathews, resident of 96 Shaheed Bagh, Lucknow.

OR

B. Public demonstrations cause lot of disturbance in the daily routine of citizens. As Moksha/Mohit write

a LETTER to the Editor of a leading national daily highlighting the need to discourage such demonstrations and disturbance by the public on highways, which cause a great loss of time and opportunity for many.

Q6A.Use of computers by students in the elite schools has become a deterrent for good handwriting. But according to those, who advocate the cause this era is the transitional phase in the history of mankind the change is imminent and adapting to it is common sense. However, you are from the old school of thought and feel extensive use of computers is a compromise with creativity and results in the increase in the tendency of a copy paste, exposing children to objectionable sites and of course eyes are another casualty. Write a letter to the editor of a newspaper expressing your concern regarding the same.

OR

Bal Vidya Public School, Bhilai, urgently requires a post-graduate teacher to teach political science for which they have placed an advertisement in The Bhilai Express. You are Sanjay/Sanjana Sharma from 21, Vasant Marg, Bhilai. Draft a letter including a CV, applying for the advertised post (120-150 words).

<u>विषय हिंदी (002)</u>

निर्देश : –

- छुट्टी का कार्य हस्तलिखित होना चाहिए।
- •चित्रों, रष्टार्ता आदि का प्रयोग आवश्यक है।
- •आपके हिंदी विषय अध्यापिका के द्वारा आप को सौंपे गए विषय पर एक परियोजना (प्रोजेक्ट) बनाएं।
- •अपना परियोजना (प्रोजेक्ट) कार्य तैयार करते समय निम्नलिखित पहलुओं को ध्यान में रखा जाना चाहिए:-
- •परियोजना (प्रोजेक्ट) A4 आकार के पृष्ठों से अधिक का नहीं होना चाहिए और इसमें शामिल होना चाहिए अगलेः-
- प्रमाण पत्र,आभार ज्ञापन,विषय-सूची,उद्देश्य, समस्या का बयान,. परिकल्पना, प्रक्रिया (साक्ष्य संग्रह, साक्ष्य का विश्लेषण), प्रस्तुतीकरण (विषय का विस्तार), अध्ययन का परिणाम,. अध्ययन की सीमाएँ, स्रोत. अध्यापक टिप्पणी
- परियोजना कार्य में शोध के दौरान सम्मिलित किए गए चित्रों और संदर्भों के विषय में उचित जानकारी दी जानी चाहिए। उनके स्रोत को अवश्य अंकित करना चाहिए।
- चित्र, रेखाचित्र, विज्ञापन, ग्राफ, विषय से संबंधित आँकड़े, विषय से संबंधित समाचार की कतरनें एकत्रित की जानी चाहिए।
- परियोजना (प्रोजेक्ट) को एक फोल्डर में रखा आना चाहिए और गर्मी के अवकाश के बाद कक्षा में लाया जाना चाहिए।
- सभी छात्रों को व्यक्तिगत रूप से इस परियोजना को प्रस्तुत करने के लिए तैयार करना चाहिए।
- **जांच परियोजना कार्य**

  रोल नम्बर 1 से 6 तक
  हिंदी कविता में प्रकृति चित्रण
- विभिन्न कवियों उनकी कविताओं का तुलनात्मक अध्ययन
- भाषा शैली विशेषताएँ
- वर्तमान के साथ प्रासंगिकता इत्यादि

रोल नम्बर 7से 14
भारतीय ग्रामीणों का जीवन

- आजादी से पहले बाद में तथा वर्तमान में स्थिति
- सुधार की आवश्यकता
- आपकी भूमिका, योगदान और सुझाव

रोल नंबर 15 से 18
समकालीन सांस्कृतिक एवं साहित्यिक विषयों से संबंधित

- भूमिका क्या है, क्यों है आदि का विवरण

- विभिन्न देशों में प्रभाव
- भारत के साथ तुलनात्मक अध्ययन
- कारण और निवारण
- आपकी भूमिका / योगदान / सुझाव

कला एकीकृत परियोजनाः-[1.1.3.1]

- अरुणाचल प्रदेश
- स्वीकृति,
- अरुणाचल प्रदेश का इतिहास,
- त्यौहार, पारंपरिक पोशाकें,
- पारंपरिक पोशाक की तस्वीरें,
- प्रसिद्ध लोसार त्यौहार उत्सव की तस्वीर,
- भौगोलिक स्थिति,
- कुछ तस्वीरें जो अरुणाचल प्रदेश को खूबसूरत बनाती हैं, एक
- हिल स्टेशन के रूप में,
- अरुणाचल प्रदेश की राजनीतिक स्थिति,
- आर्थिक स्थिति,
- अरुणाचल प्रदेश अर्थव्यवस्था पर एक प्रवाह चार्ट
- ग्रंथ सूची
- जमा करने हेतु दिशानिर्देशः *
- अपनी जांच परियोजना कार्य और कलाएकीकृत कार्य साफ-सुथरे हस्तलिखित में जमा करें। प्रत्येक सबमिशन के कवर पेज पर अपना नाम, कक्षा और रोल नंबर शामिल करें।

ACCOUNTANCY (055)

1. A and B are equal partners with capitals of ₹2,00,000 and ₹1,00,000 respectively. As per deed, they are allowed an interest @ 8% on capital. During the year, the firm earned a profit of ₹12,000. Interest on capital allowed to A and B will be: 1

(a) ₹16,000 and ₹8,000 respectively

(b) ₹8,000 and ₹4,000 respectively

(c) Nil

(d) ₹6,000 each

2. A partner, Gaurav, withdrew ₹12,000 in the beginning of the each quarter during the year. Interest on drawings @ 8% chargeable to him will be1

(a) ₹1,440 (b) ₹2,400

(c) ₹2,080 (d) ₹1,760

3. On which side Partner's drawings out of Capital will be recorded, when their capitals are fixed? 1

(a) Debit side of Capital A/c (b) Credit side of Capital A/c

(c) Debit side of Current A/c (d) Credit side of Current A/c

4. Which of the following items is not recorded in Profit and Loss Appropriation A/c? 1

(a) Interest on Partner's Capital

(b) Amount of Partner's drawings

(c) Profit as per Profit and Loss

(d) Commission to a partner

5. Net profit before commission has been ₹1,20,000. Partner's commission is 20% of net profit before charging such commission. The amount of partner's commission is:

(a) ₹25,000 (b) ₹24,000

(c) ₹20,000 (d) ₹22,000

6. A, B and C are partners in a firm sharing profits in the ratio 2 : 2 : 1. C is guaranteed a minimum profit of ₹40,000 by A. Profit for the year amounted to ₹1,60,000. The profit credited to each partner will be: 1

(a) ₹40,000, ₹80,000, ₹40,000 (b) ₹56,000, ₹64,000, ₹40,000

(c) ₹ 64,000, ₹64,000, ₹32,000 (d) ₹60,000, ₹60,000, ₹40,000

7. P, Q and R are partners sharing profits in the ratio 3 : 2 : 1. Interest on capital of P, Q and R ₹1,800, ₹2,100 and ₹1,500 respectively is omitted to be provided. The adjustment entry will be: 1

(c) Both (a) and (b)

(d) Neither (a) nor (b)

8. The balances of partner's current account are: 1

(a) Debit

(b) Credit

(c) always credit

(d) either debit or credit

9. Nusrat and Sonu were partners in a firm sharing profits in the ratio of 3 : 2. During the year ended 31st March, 2023 Nusrat had withdrawn ₹15,000. Interest on her drawings amounted to ₹300. Pass necessary journal entry for charging interest on drawings assuming that the capitals of the partners were fixed. 1

10. A, B and C are partners in a firm. Their capital accounts showed the balance on 1st April 2022 as 20,000; ₹15,000 and ₹10,000 respectively. During the year A withdrew ₹400 at the beginning of the each month. B withdrew ₹500 at the end of the each month. C withdrew ₹800 at the middle of the each month for six month ending 30th September 2022. Interest on drawing is to be charged @ 12% p.a. Calculate interest on drawings of each partner. 3

11. Zee and Vee are partners in a firm. Their capital accounts showed the balance on 1st April, 2022 as 20,000 and ₹15,000 respectively. During the year 2022-23, Zee introduced additional capital of 10,000 on August 1, 2022 and Vee introduced ₹15,000 on 1st October, 2022. Interest on capital is allowed @ 6% p.a. on the capital. Calculate interest on capital of each partner. 3

12. A, B, C, D, X, Y and Z are partners in a firm. During the year A withdrew 300 at the beginning of the each month. B withdrew 600 at the end of the each month. C withdrew 500 at the middle of the each month. D withdrew 1,000 at the beginning of the each quarter. X withdrew 2,000 at the end of the each quarter. Y withdrew 5,000 during the year. Z withdrew the following:-

	(₹)
April 30, 2022	6,000
June 30, 2022	4,000
September 1, 2022	8,000
December 31, 2022	3,000
February 28, 2023	5,000

Interest on drawing is to be charged @ 12% p.a. Calculate interest on drawings for the year 31st March 2023. 3

13. The Partnership agreement between Maneesh and Girish provides that:

(i) Profits will be shared equally;

(ii) Maneesh will be allowed a salary of 400 p.m;

(iii) Girish who manages the sales department will be allowed a commission equal to 10% of the net profits, after allowing Maneesh's salary;

(iv) 7% p.a. interest will be allowed on partner's fixed capital;

(v) 5% interest will be charged on partner's annual drawings;

(vi) The fixed capitals of Maneesh and Girish are ₹1,00,000 and ₹80,000 respectively. Their annual drawings are ₹16,000 and ₹14,000 respectively. The net profit for the year ending March 31, 2023 amounted to ₹40,000.

Prepare firm's Profit and Loss Appropriation Account. 3

14. A and B entered into partnership on 1st April, 2022 without any partnership deed. They introduced capitals of ₹5,00,000 and ₹3,00,000 respectively. On 31st October, 2022, A advanced ₹2,00,000 by way of loan to the firm without any agreement as to interest. The profit and loss account for the year ended 31.03.2023 showed a profit ₹4,30,000 but the partners could not agree upon the amount of interest on loan to be charged and the basis of division of profits. Pass a journal entry for the distribution of profit between the partners. 3

15. A and B are partners in a firm. A is to get a commission of 10% on net profit before charging any commission. B is to be get commission of 10% on net profit after charging all commission. Net profit before charging any commission was ₹2,20,000. Find out the commission of A and B and prepare Profit and Loss Appropriation A/c. 3

16. A, B, C and D are the four partners sharing profit as 4 : 3 : 2 : 1. They earned a profit of 1,80,000 for the year ended 31.03.2023. As per the deed they are to charge a commission @ 20% of the profit after charging such commission which they will share as 2 : 3 : 2 : 3. Prepare Profit and Loss Appropriation Account showing the distribution of profits and the share of each partner assuming capital accounts are maintained on fixed capital system. 3

17. K and P were partners in a firm sharing profits in 4 : 3 ratio. Their capitals on 01.04.2022 were: K ₹80,000 and P 60,000. The partnership deed provided as follows:

(i) Interest on capital and drawings will be allowed and charged @ 12% p.a. and 10% p.a. respectively.

(ii) K and P will be entitled to a monthly salary of 2,000 and ₹3,000 respectively. The profits for the year ended 31.03.2023 were 1,00,300. The drawings of K and P were ₹40,000 and 50,000 respectively.

Prepare Profit and Loss Appropriation Account and Capital Account of K and P for the year ended 31.3.2023 assuming that the capitals of the partners were: (i) fluctuating. (ii) Fixed. (3+3)

18. Lokesh and Azad are partners sharing profits in the ratio 3 : 2, with capitals of ₹50,000 and ₹30,000, respectively. Interest on capital is agreed to be paid @ 6% p.a. Azad is allowed a salary of ₹2,500 p.a. During 2022-23, the profits prior to the calculation of interest on capital but after charging Azad's salary amounted to 12,500. A provision of 5% of profit is to be made in respect of manager's commission. Prepare accounts showing the allocation of profits and partner's capital accounts.

3

19. X and Y are partners in a firm sharing profits in the ratio of 3 : 2. On 1 April 2022 their fixed capitals were 3,00,000 and 2,50,000 respectively. On 1.7.2022 they decided that their total fixed capital should be 6,00,000. They further decided that this capital should be in their profit sharing ratio. Accordingly, they introduced extra capital or withdrew excess capital. The partnership deed provided for the following:

(i) Interest on capital @ 12% p.a.

(ii) Interest on drawings @ 18% p.a.

(iii) A monthly salary of ₹2,000 to X and a monthly salary of ₹1,500 to Y. The drawings of X and Y during the year as follows:

Year 2022-23	X (₹)	Y (₹)
June 30	20,000	15,000
September 30	20,000	25,000

During the year ended 31.03.2023, the firm earned a net profit of ₹1,50,000. 10% of this profit was to be transferred to general reserve. You are required to prepare:
(i) P & L Appropriation A/c (ii) Partner's Capital A/c (iii) Partner's Current A/c. (3+3)

20. Ram and Shyam were partners in a firm. After adjusting the profits of the year ₹2,00,000 and drawings in their Capital Accounts, the balances of their capital were Ram ₹4,00,000 and Shyam ₹3,00,000. During the year Ram withdrew ₹80,000 and Shyam ₹1,00,000. It was found that interest on Capital and Drawings @ 10% p.a. as provided in the partnership agreement had not been allowed and charged to the partners' capital accounts. Pass the necessary adjustment entry. 3

21. Radha, Mary and Fatima are parters sharing profits in the ratio of 5 : 4 : 1. Fatima is given a guarantee that her share of profit, in any year will not be less than ₹5,000. The profits for the year ending March 31, 2023 amounts to ₹35,000. Shortfall if any, in the profits guaranteed to Fatima is to be borne by Radha and Mary in the ratio of 3 : 2. Record necessary journal entry to show distribution of profit among partner. 3

22. Ankur and Bobby were into the business of providing software solutions in India. They were sharing profits and losses in the ratio 3 : 2. They admitted Rohit for a 1/5 share in the firm. Rohit, an alumni of IIT, Chennai would help them to expand their business to various South African countries where he had been working earlier. Rohit is guaranteed a minimum profit of ₹2,00,000 for the year. Any deficiency in Rohit's share is to be borne by Ankur and Bobby in the ratio 4 : 1. Losses for the year ₹10,00,000. Pass the necessary journal entries. 3

23. Deepti, Tanuja and Renu were partners in a firm trading in hand sanitizer. They were sharing profits in the ratio of 3 : 3 : 2. Their Fixed capitals on 1st April, 2022 were ₹ 2,00,000, ₹ 3,00,000 and ₹ 6,00,000 respectively.

During the COVID pandemic, all partners decided to help the poor daily workers personally. For this, Deepti withdrew ₹ 20,000 from the firm on 15th September, 2022. Tanuja instead of withdrawing cash from the firm took hand sanitizer amounting to ₹ 24,000 from the firm and distributed those to the worker's families. On the other hand, Renu withdrew ₹ 1,00,000 from her capital on 1st January, 2023 and provided a mobile medical van in the containment Zone.

The partnership deed provides for charging interest on drawings @ 6% p.a and allowing interest on capital @ 9% p.a. The net profit of the firm for the year ended on 31st March, 2023 before providing for any of the above adjustments was ₹ 1,57,500. Partners also decided to donate 10% of net profit to Chief Minister relief fund. Based on the above information you are required to answer the following question 3

I. Interest on Tanuja's Drawing will be:

(a) ₹ 1,440 (b) ₹ 720

(c) NIL (d) ₹ 240

II. Interest on Partners drawing will be debited to :

(a) Profit and Loss A/c

(b) Partners' Capital A/c

(c) Profit and Loss Appropriation A/c

(d) Partner's Current A/c

III. Interest on Renu's Capital will be_____.

24. Puneet and Raju are partners in a clay toys making firm. Their capitals were ₹ 5,00,000 and ₹10,00,000 respectively. The firm allowed Puneet to get a commission of 10% on the net profit before charging any commission and Raju to get a commission of 10% on the net profit after charging all commission. Following is the Profit and Loss Appropriation Account for the year ended 31st March 2023.

Dr. Profit and Loss Appropriation Account for the year ended 31st March 2023 Cr.

Particulars	Amount (₹)	Particulars	Amount (₹)
To Puneet's Capital A/c (Commission)	44,000	By Profit and Loss A/c	....
(..... × 10/100)	.....		
To Raju's Capital A/c (Commission)	...		
To Profit share transferred to :			
Puneet's Capital A/c	.....		
Raju's Capital A/c	...		
	....		

	....		....

I. Raju Commission will be: 1

(a) ₹ 40,000 (b) ₹ 44,000

(c) 36,000 (d) ₹ 36,440

II. Puneet's share of profit will be: 1

(a) ₹ 1,80,000 (b) ₹ 1,44,000

(c) ₹ 2,16,000 (d) ₹ 1,60,00

III. What Journal entries are passed for Commission payable to Raju. 1

CBSE SAMPLE PAPER 1 (2023-4)

1. Assertion: Batman, a partner in a firm with four partners has advanced a loan of ₹ 50,000 to the firm for last six months of the financial year without any agreement. He claims an interest on loan of ₹ 3,000 despite the firm being in loss for the year.

Reasoning: In the absence of any agreement / provision in the partnership deed, provisions of Indian Partnership Act, 1932 would apply. 1

(a) Both A and R are correct, and R is the correct explanation of A.

(b) Both A and R are correct, but R is not the correct explanation of A.

(c) A is correct but R is incorrect.

(d) A is incorrect but R is correct.

2. A, B and C are in partnership business. A used ₹ 2,00,000 belonging to the firm without the information to other partners and made a profit of ₹ 35,000 by using this amount. Which decision should be taken by the firm to rectify this situation?

(a) A need to return only ₹ 2,00,000 to the firm.

(b) A is required to return ₹ 35,000 to the firm.

(c) A is required to pay back ₹ 35,000 only equally to B and C.

(d) A need to return ₹ 2,35,000 to the firm.

3. Interest on Partner's loan is credited to: 1

(a) Partner's Fixed capital account.

(b) Partner's Current account.

(c) Partner's Loan Account.

(d) Partner's Drawings Account.

4. Annu, Banu and Chanu are partners, Chanu has been given a guarantee of minimum profit of ₹ 8,000 by the firm. Firm suffered a loss of ₹ 5,000 during the year. Capital account of Banu will be _____ by ₹_.

(a) Credited, ₹ 6,500 (b) Debited, ₹ 6,500

(c) Credited, ₹ 1,500 (d) Debited, ₹ 1,500

Read the following hypothetical situation, answer question no. 5 and 6.

Richa and Anmol are partners sharing profits in the ratio of 3 : 2 with capitals of ₹ 2,50,000 and ₹ 1,50,000 respectively. Interest on capital is agreed @ 6% p.a. Anmol is to be allowed an annual salary of ₹12,500. During the year ended 31st March 2023, the profits of the year prior to calculation of interest on capital but after charging Anmol's salary amounted to ₹ 62,000. A provision of 5% of this profit is to be made in respect of manager's commission. Following is their Profit & Loss Appropriation Account.

Particulars	**Amount ₹**	**Particulars**	**Amount ₹**
To Interest on Capital Richa Anmol To Anmol's Salary A/c To Profit transferred to: Richa's Capital A/c Anmol's Capital A/c	 …… …… 12,500 ……(1)…… ……	By Profit and loss account (After manager's commission)	……(2)……
	……		……

5. The amount to be reflected in blank (1) will be: 1

(a) ₹ 37,200 ₹ 44,700

(c) ₹ 22,800 ₹ 20,940

6. The amount to be reflected in blank (2) will be: 1

(a) ₹ 62,000 ₹ 74,500

(c) ₹ 71,400 ₹ 70,775

7. In the absence of an agreement, partners are entitled to: 1

(i) Profit share in capital ratio.

(ii) Commission for making additional sale.

(iii) Interest on Loan & Advances by them to the firm.

(iv) Salary for working extra hours.

(v) Interest on Capital.

Choose the correct option:

(a) Only (i), (iv) and (v)

(b) Only (ii) and (iii)

(c) Only (iii)

(d) Only (i) and (iii)

8. A and B are partners. B draws a fixed amount at the end of every quarter. Interest on drawings is charged @ 15% p.a. At the end of the year interest on B's drawings amounted to ₹ 9,000. Drawings of B were: 1

(a) ₹ 24,000 per quarter.

(b) ₹ 40,000 per quarter.

(c) ₹ 30,000 per quarter.

(d) ₹ 80,000 per quarter.

9. Shyam, Gopal & Arjun are partners carrying on garment business. Shyam withdrew ₹ 10,000 in the beginning of each quarter. Gopal, withdrew garments amounting to ₹ 15,000 to distribute it to flood victims, and Arjun withdrew ₹ 20,000 from his capital account. The partnership deed provides for interest on drawings @ 10% p.a. The interest on drawing charged from Shyam, Gopal & Arjun at the end of the year will be 3

(a) Shyam ₹ 4,800; Gopal ₹ 1,000; Arjun ₹ 2,000.

(b) Shyam ₹ 4,800; Gopal ₹ 1,000; Arjun ₹ 2,000.

(c) Shyam ₹ 2,500; Gopal ₹ 750; Arjun Nil.

(d) Shyam ₹ 4,800; Gopal Nil; Arjun Nil.

10. P, Q and R were partners with fixed capital of ₹ 40,000, ₹ 32,000 and ₹ 24,000. After distributing the profit of ₹ 48,000 for the year ended 31st March 2022 in their agreed ratio of 3 : 1 : 1 it was observed that:

(a) Interest on capital was provided at 10% p.a. instead of 8% p.a.

(b) Salary of ₹ 12,000 was credited to P instead of Q.

You are required to pass a single journal entry in the beginning of the next year to rectify the above omissions. 3

11. Cheese and Slice are equal partners. Their capitals as on April 01, 2022 were ₹ 50,000 and ₹ 1,00,000 respectively. After the accounts for the financial year ending March 31, 2023 have been prepared, it is observed that interest on capital @ 6% per annum and salary to Cheese @ ₹ 5,000 per annum, as provided in the partnership deed has not been credited to the partners' capital accounts before distribution of profits.

You are required to give necessary rectifying entries using P & L adjustment account. 3

CBSE SAMPLE PAPER 2 (2023-4)

1. Read the following statements: Assertion (A) and Reason (R). Choose the correct alternative from those given below.

Assertion: Michael, Mike and Stephen were partners sharing profits and losses in the ratio 3:2:1. Stephen being a partner wants that he should be exempted from sharing the losses in the firm.

Reasoning: According to Partnership Act 1932,"It may be agreed between the partners that one or more of them shall not be liable for losses."

Alternatives: 1

(a) Both A and R are correct, and R is the correct explanation of A.

(b) Both A and R are correct, but R is not the correct explanation of A.

(c) A is correct but R is incorrect.

(d) A is incorrect but R is correct.

2. Mike and Ken were two partners sharing profits and losses in the ratio 4:3. Ken was in need of funds so he took a loan of ₹50, 000 from the firm at an agreed rate of interest being 10% p.a. If Interest is charged on loan to the partner it will be: 1

(a) Debited to Profit and Loss A/c

(b) Credited to Profit and Loss A/c

(c) Debited to Profit and Loss Appropriation A/c

(d) Credited to Profit and Loss Appropriation A/c

3. Stella, Grace and Carol were partners in the firm sharing profits and losses in the ratio 3:2:1. Carol was guaranteed a profit of 15,000 after making all adjustments. Any deficiency is to be borne by Grace. The net profit for the year 31st March 2023 was ₹60,000. Grace will be

_____by ₹_____. 1

(a) Credited, ₹6,500.

(b) Debited, ₹5,000.

(c) Credited, ₹7,500.

(d) Debited, ₹ 2,500.

Read the following hypothetical situation and answer question no. 4 and 5.

Ana and Anne started a partnership business on 1st April, 2022. Their capital contributions were ₹ 3, 00,000 and ₹ 1, 00,000 respectively. Ana rented her property to carry on business for ₹2, 500 p.m. Interest on capitals @12% p.a. Ana, to get a salary of ₹ 4,000 p.m. Anne to get a commission of 2% of the net profit. Profits are to be shared in the ratio of 3:2. The profits for the year ended 31st March, 2023 before providing for rent was ₹ 2, 00,000.

Dr. Profit and Loss Appropriation Account Cr.

for the year ended 31st March, 2023

Particulars	**₹**		**Particulars**	**₹**
To Interest on capital: Ana Anne		_____	By Profit and Loss A/c	_____*(2)*
To Partner's Salary: Ana To				
Anne's commission To Profit		_____		
transferred to Ana's Capital	48,000			
A/c Anne's Capital A/c		_____	(	
			1	
		_____	)	

4. The amount to be reflected in blank (1) will be: 1

(a) ₹3,720 (b) ₹3,400

(c) ₹ 2,800 (d) ₹2,940

5. The amount to be reflected in blank (2) will be:(a) 1

₹1,62,000 (b) ₹ 1,74,500

(c) ₹ 1,71,400 (d) ₹1,70,000

6. Which of the following is a right of a partner? 1

(a) sharing profits and losses with other partners in the agreed ratio

(b) inspecting and having a copy of the books of accounts

(c) retiring from the firm without giving proper notice

(d) taking part in the misconduct of the business

Choose the correct option:

(i) Only (b) and (c)

(ii) Only (c)

(iii) Only (a) and (b)

(iv) Only (a) and (d)

7. Edward and Hayward are partner Edward draws a fixed amount at the beginning of every quarter. Interest on drawings is charged @10% p.a. At the end of the year, interest on Edward's drawings amounted to ₹7,500. Drawings of Edward were: 1

(a) ₹ 34,000 per quarter.

(b) ₹ 44,000 per quarter

(c) ₹ 30,000 per quarter

(d) ₹ 60,000 per quarter

8. Ayan, Azan and Aqib are partners carrying on furniture business. Ayan withdrew ₹ 5,000 at the end ofeach month. Azan withdrew ₹10,000 at end of each quarter. Aqib withdrew ₹40,000 at the end of eachmonth for six months. The partnership deed provides for interest on drawings @ 12% p.a. The intereston drawing charged from Ayan, Azan and Aqib at the end of the year will be: 1

(a) Ayan- ₹ 1,800, Azan- ₹3,300, Aqib- ₹ 6,000

(b) Ayan- ₹ 2,400, Azan- ₹ 1,200,

Aqib- ₹ 5,000(c) Ayan- ₹ 1,400, Azan- ₹ 3,200,

Aqib- ₹ 2,000(d) Ayan- ₹ 3,200,

Azan- ₹ 2,300, Aqib- ₹ 8,000

9. Viraf, Virat and Vaibhav were partners with capitals of ₹2,30,000, ₹1,20,000and ₹2,40,000. After distributing the profit of 5,20,000 for the year ended 31st March 2023 in their agreed ratio

of 3:2:1 it was observed that: Interest on capital was provided at 14% p.a. instead of 10% p.a. You are required topass adjustment entry. 3

10. Eden and Ivon were partners in a firm sharing profits and losses in the ratio of 5:4. Their capitals were
₹75,000 and ₹ 90,000 respectively. After the accounts for the financial year ending March 31, 2023 have been prepared, it is observed that interest on capital @ 10% per annum and salary to Eden @ ₹9,000 per annum, as provided in the partnership deed has not been credited to the partners' capital accounts before distribution of profits. You are required to give necessary rectifying entries using Profit and Loss Adjustment Account

BIOLOGY (044)

Art Integration Project(1.1.1).

1.Sheezal- Project on Bevrages of Arunachal Pradesh
2.Prince-Project on Fruits and vegetables of Arunachal Pradesh
3.Riya- Project on Rivers of Arunachal Pradesh
4.Azeem- Project on Man made forms of Arunachal Pradesh
5.Pooja-Project on Rivers of Arunachal Pradesh
6.Himanshu- Project on Bevrages of Arunachal Pradesh

Investigatory project

Sheezal- Cancer
Prince- Thalassemia/ Sewage treatment
Riya – Infertility
Azeem- Heart diseases and Blood pressure
Pooja- Mendalian disorders
Himanshu- Recombinant DNA technology in today's medicine
The project file must contain
Front page
Acknowledgement
Certificate
Aim
Index
Theory
Bibliography
Thank you page with science/Biology quote

Working Models

1.Represent DNA and genetic coding using embroidery block printing or beadwork.
2.Infographic poster or model showing genetically modified crop, insulin production, cloning.
3.Create eco art installation or upcycled model showing food chain, pyramid, biological cycle.
4.Animated video or puppet showing the immune system fighting pathogen
Working model: You can choose anyone according to your convenience.Everyone has to prepare one working model individually.

CHEMISTRY (043)

Instruction : Following work to be done in notebook.

Q1. Write down the electronic configuration of:

Cr^{3+}

Pm^{3+}

Cu^{+}

Ce^{4+}

Co^{2+}

Lu^{2+}

Mn^{2+}

Th^{4+}

Q 2 Why are Mn^{2+} compounds more stable than Fe^{2+} towards oxidation to their +3 state?

Q3 Explain briefly how +2 state becomes more and more stable in the first half of the first row transition elements with increasing atomic number?

Q4 To what extent do the electronic configurations decide the stability of oxidation states in the first series of the transition elements? Illustrate your answer with examples.

Q5 What may be the stable oxidation state of the transition element with the following d electron configurations in the ground state of their atoms:$3d^3$, $3d^5$, $3d^8$ and $3d^4$

Q6 Name the oxometal anions of the first series of the transition metals in which the metal exhibits the oxidation state equal to its group number.

Q7 What is lanthanoid contraction? What are the consequences of lanthanoid contraction?

Q8 What are the characteristics of the transition elements and why are they called transition elements? Which of the d-block elements may not be regarded as the transition elements?

Q9 In what way is the electronic configuration of the transition elements different from that of the non transition elements?

Q10 What are the different oxidation states exhibited by the lanthanoids?

Art integrated activity (1.1.8)

☐ Below activity to be done as investigatory project report as per the roll numbers.

a) Study of the presence of oxalate ions in guava fruit at different stages of ripening.

b) Study of quantity of casein present in different samples of milk.

c) Preparation of soybean milk and its comparison with the natural milk with respect to curd formation, effect of temperature, etc.

d) Study of the effect of Potassium Bisulphate as food preservative under various conditions (temperature, concentration, time, etc.)

e) Study of digestion of starch by salivary amylase and effect of pH and temperature on it.

f) Comparative study of the rate of fermentation of following materials: wheat flour, gram flour, potato juice, carrot juice, etc.

g) Extraction of essential oils present in Saunf (aniseed), Ajwain (carom), Illaichi (cardamom).

h) Study of common food adulterants in fat, oil, butter, sugar, turmeric powder, chili powder and pepper.

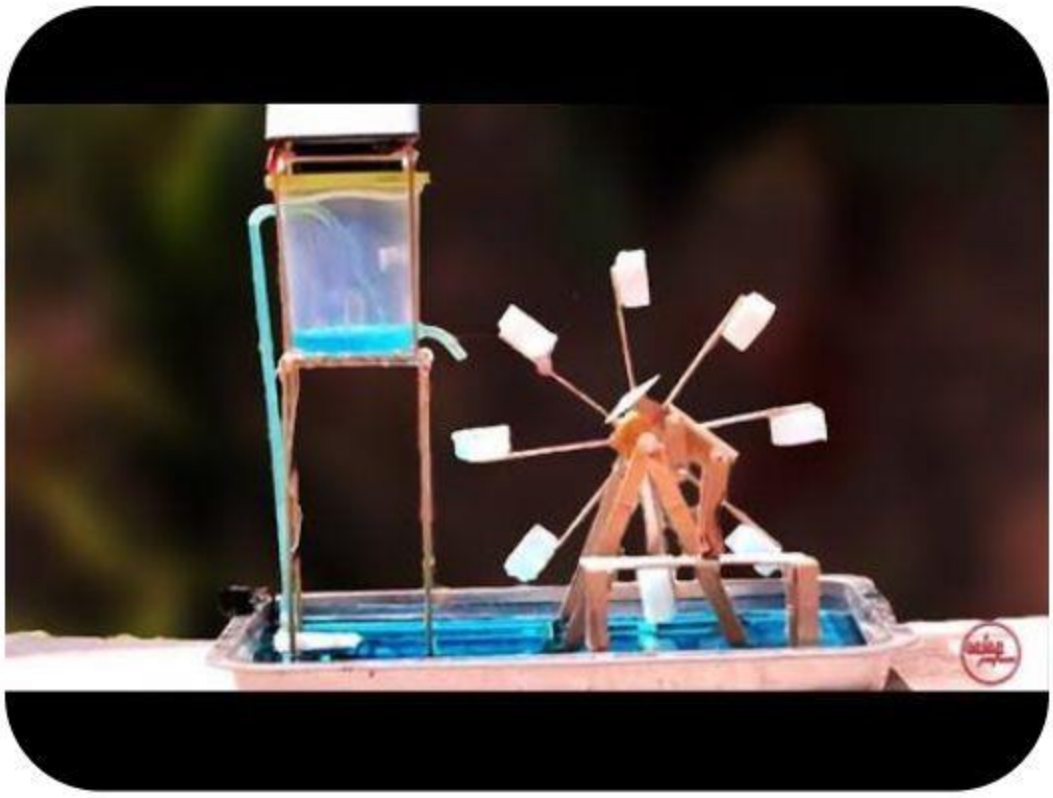
Note:

Any other investigatory project, which involves about 10 periods of work, can be chosen with the approval of the teacher.*

Following content should be covered in the project
COVER PAGE:
TITLE,
ACKNOWLEDGMENT,
CERTIFICATE,
OVERVIEW,
INDEX,
DESCRIPTION WITH PHOTOGRAPHS & DIAGRAMS,
BIBLIOGRAPHY,
THANK YOU PAGE WITH A RELATED SCIENCE QUOTE

- ☐ Project (choose any one
- ☐ Make a working model or 3D model of periodic table in abacus style.
- ☐ Make working model or 3D model of atoms or molecules.
- ☐ Make a working model or 3D model of hydro energy project.

Here are some examples given for you project work



BUSINESS STUDIES (054)

Case Studies –(Chapter -2)

Principles of Management

Q. 1. In your school, you observe that books are kept in office, chalks in the library and office records in the staff room.

1. Which principle of management is violated here and why?

2. How will that affect the achievement of school objectives?

3. As a manager, what steps will you take to rectify the shortcomings? (3 marks)

Q. 2. The production manager of an automobile company asked the foreman to achieve a target production of 200 scooters per day. But he did not give him the authority of requisition tools and materials from the stores department. Can the production manger blame the foreman if he is not able to achieve the desired target? Explain briefly the principle relating to the situation.
(3 marks)

Q. 3. Soniya Ltd. was engaged in the business of manufacturing auto components. Lately, its business was expanding due to increased demand for cars. The competition was also increasing. In order to keep its market share intact, the company directed its workforce to work overtime. But this resulted in many problems.

Due to increased pressure of work the efficiency of workers declined. Sometimes, the subordinates had to work for more than one superiors. The workers were becoming indisciplined. The spirit of teamwork, which had characterized the company previously, had begun to wane.

Identify any three principles of management (as given by Henry Fayol) which were begin violated, quoting the lines from the above case. (3 marks)

Q. 4. The production manager of Harsh Ltd. instructs a salesman to go slow in selling the product, where the marketing manager is insisting on fast selling to achieve the target. Which principle of management is being violated in this case? (1 mark)

Q. 5. Kanika and Priyanka are typists in a company having same educational qualifications. Kanika is getting Rs. 16000 per month and Priyanka Rs. 10000 per month as salary for the same working hours. Which principle of management is violated in this case. (1 mark)

Q. 6. Rishabh, a manager, very often speaks to people at all levels, passing on instructions regarding his department and also the other departments. Which principle of management is being overlooked? (1 mark)

Q. 7. The management and workers have entered into an agreement that workers will do overtime to cover up looses of the company. In return, the manager will increase the wages. But management later refused to increase the wages. Name the principle violated in this situation. (1 mark)

Q. 8. In Simran Ltd., an employee has the objective of maximizing his salary, but the organizational objective is to maximize output at competitive cost. There was some dispute on this for a while. Eventually, the organization's interest was given priority over employees' interest. Name the principle related to this situation. (1 marks)

Q. 9. Radhika opens a jewelry showroom in Jaipur after completing a course in jewelry designing. She has employed eleven persons in her showroom. For greater productivity, she divides the work into small tasks and each employee is trained to perform his/her specialized job. The sales persons are allowed to close a deal with a buyer by giving a maximum of 10% discount, whereas the decision to given any further discount rests with Radhika as the final authority. In the earlier days of starting of the business, five of her employees were asked to put in extra hours of work. In return she had promised to give them a special incentive within a year. Therefore, after six months when the business was doing well, she awarded a cash bonus to each of these employees to honour her commitment. However, when it comes to setting the conflicts among her employees, she tends to b e more biased towards her female employees.

In context of the above case:

1. Identify and explain the various principles of management that are being applied by Radhika by quoting lines from the paragraph.

2. Identify and explain the principle of management which is being violated by Radhika by quoting lines from the paragraph.

3. State any one effect of the violation of the principle of management by Radhika as identified in part (b) of the question.

Q. 10. Neeraj is selected for the post of software developer in an IT Company. On the first day of his joining Mehul, his project manager tells Neeraj that during the course of his work he will come across many such opportunities which may temp him to misuse his powers for individual or family's benefit at the cost of larger general interest of the company. In such situations, he should rather exhibit exemplary behavior as it will raise his stature in the eyes of the company. Also, for interacting

with anyone in the company on official matters, he should adopt the formal chain of authority and communication.

In context of the above case:

1. Identify and explain the various principles of management that Mehul is advising Neeraj to follow while doing his job.

2. List any two values that Mehul wants to communicate to Neraj.

Q. 11. Davinder is a class twelfth commerce student in a reputed school in Punjab. Satinder is his elder brother who is doing his Masters in Hospital administration from Delhi after completing his B. Sc course. During vacations when Satinder comes home, Davinder shows him the business studies project that he is preparing on the topic 'Principles of Management'. Satinder tells him that these principles are also a part of MBA course curriculum at the beginner's level as they form the core of management in practice. But he finds these principle different from those of pure science.

In context of the above case:

1. Outline the concept of principles of management.

2. Why does Satinder find the principle of management different from those of pure science?

3. Why do the principles of management form the core of management in practice? Explain by

giving any two points highlighting the importance of principles of management.

Q. 12. Nutan Tiffin Box service was started in Mumbai by Mumbai dabbawalas. The Dabbawalas who are the soul of entire Mumbai aim to provide prompt and efficient services by providing tasty homemade tiffin to all office goers at right time and place. The service is uninterrupted even on the days of bad weather, political unrest and social disturbances. Recently they have started online booking system through their website' mydabbawals.com'. owing to their tremendous popularity amongst the happy and satisfied customers and members, the dabbawalas were invited as guest lecturers by top business schools. The Dabbawals operate in a group of 25-30 people along with a group pleader. Each group teams up with other groups in order to deliver the tiffin on time. They are not transferred on frequent basis as they have to remember the addresses of their customers. They follow certain rules while doing trade-No alcohol during working hours; No leave without permission; Wearing of white cap & carrying ID cards during business hours.

Recently on the suggestion of a few self motivated fellow men, the dabbawalas thought out and executed a plan of providing food left in tiffins by customers to slum children. They have instructed their customers to place red sticker if food is left in the tiffin, to be fed to poor children later.

1. State any one principle of management given by Fayol & one characteristic of management mentioned in the above case.

2. Given any two values which the Dabbawalas want to communicate to the society.(4 marks)

Q. 13. 'Aapka vidyalaya' believes in holistic development of students and encourages team building through a mix of curricular, co-curricular and sports activities. On its founders day a stage performance had to be put up. A committee of ten prefects was constituted to plan different aspect of the function. They all

decided to use recycled paper for decoration. There was a spirit of unit and harmony and all members supported each other. With mutual trust and belongingness the programme was systematically planned and executed. Kartik, one of the prefects realized that unknowingly the group had applied one of the principles of management while planning and executing the programme. He was so inspired by the success of the function that he asked his father to apply to same principle in his business. His father replied that he was already using this principle.

1. Identify the principle of management applied for the success of the programme.

2. State any two features of management highlighted in the above para.

3. Identify any two values which 'Aapka Vidyalaya' communicated to the society. (4 marks)

Q. 14. Nikita and Salman completed the MBA and started working in a multinational company at the same level. Both are working hard and are happy with their employer. Salman had the habit of backbiting and wrong reporting about his colleagues to impress his boss. All the employees in the organization knew about it. At the time of performance appraisal the performance of Nikita was judged better than Salman. Even then their boss, Mohammed Sharif decided to promote Salman stating that being a female Nikita will not be able to handle the complications of a higher post.

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

2. Identify the values which are being ignored quoting the liens the above para. (5 marks)

Q. 15. Sigma Ltd. is a large company manufacturing electric motors. The company has several departments – Production, Marketing, Finance and HR. Mr. Shashank, CEO of the company set the target sale of 10 crore in a month. To increase the sales, the marketing manager, Mr. Ishaan insists on offering 10% discount to customers. But the finance manager, Mr. Mohak does not approve such discount as it would mean loss of revenue. Because of dual subordination, the sales manager, Mr. Anshik could not achieve the sales target.

1. Which concept of management Sigman Ltd. is lacking? State it.

2. Which principle of management has been overlooked by this company? State it.

3. Which principle of management has been overlooked by this company? State it. (6 marks)

Q. 16. ABC Ltd. is engaged in producing electricity from domestic garbage. There is almost equal division of work and responsibility between workers and management. The management even takes workers into confidence before taking important decisions.

All the workers are satisfied as the behavior of the management is very good.

1. State the principle of management described in the above para.

2. Identify any two values which the company wants to communicate to the society. (3 marks)

Q. 17. Voltech India Ltd. is manufacturing LED bulbs to save electricity and running under heavy losses.

To revive from the losses, the management thought of shifting the unit to a backward area where labour is available at a low cost. The management also asked the workers to work overtime without any additional payment and promised to increased to wages of the workers after achieving its mission. Within a short period the company started earning profits because both the management and the workers honoured their commitments.

1. State the principle of management described in the above para.

2. Identify any two values that the company wants to communicate to the society. (3 marks)

Q. 18. Kushal Ltd. is a leading automobile company in which the various departments are setting up their own objectives without paying any interest to the organizational objectives.

1. Which aspect of management the company is lacking? What will be its impact on the organization?

2. Identify the principle of management which has been overlooked by this organization.

3. State any two values neglected by the people of this organization. (5 marks)

Q. 19. Telco Ltd. is manufacturing files and folders from old clothes to discourage use of plastic fields and folders. For this, they employ people from nearby villages where very less job opportunities are available. An employee, Harish, designed a plan for cost reduction but it was not welcomed by the production manager. Another employee gave some suggestion for improvement in design, but it was also not appreciated by the production manager.

1. State the principle of management described in the above para.

2. Identify any two values that the company wants to communicate to the society. (3 marks)

Q. 20. Khandelwal Ltd., a tyre manufacturing concern has been established for more than ten years. Having made good profits in the past, company wanted to expand further and hence did not declare bonus for the previous year. The workers got agitated and trade union declared strike and demanded bonus and other facilities. The management decided not to give into their demands.

1. Which principle of scientific management is overlooked in the given case?

2. State any two values overlooked/ignored by the management in the above case.(3 marks)

Q. 21. Hritik is desirous of setting up a small factory to manufacture different kinds of eco-friendly packaging materials. He proposes to adopt to logical approach to his business rather than hit and trial method as he knows that this can result in tremendous saving of human energy as well as

wastage of time and materials. He plans to adopt paternalistic style of management in practice in order to avoid any kind of class-conflict that may emerge between him and the workers. Moreover, he plans to seek the opinion of his workers before taking any important decisions and also offers incentives to them for providing valuable suggestions for the business.

In context of the above case:

1. Identify and explain the various principle of scientific management that Hritik plans to apply in his

business.

2. List any two values that he wants to communicate to the society by offering eco-friendly packaging material.

Q. 22. Gaurika has been appointed as the chief organizer of a weeklong cultural event. Being a staunch follower of scientific management, she decides to execute her work by putting into practice the various techniques of scientific management. On the basis of several observations, she is able to determine that the standard time taken by the security officer at the gat to check the credentials of each visitor is 30 seconds. So she decides to employ two persons on this job for every function along with the other necessary support staff. She considers the fact that every day, the functions will take place in three shifts of four hours each, therefore it is important to give breaks to the support staff even in a single shift to take her/his lunch etc. moreover, on introspection, she determines that the best way to distribute refreshment boxes to the visitors will be to hand it over to them at the exit gate as it would help to save time and eliminate any kind of confusion.

In the context of the above case:

1. Identify and explain the various techniques of work study which have been put into practice by Gaurika.

2. List any two values that Gaurika wants to communicate to the society.

Q. 23. 'Study Buddy Pvt.' Is company dealing in stationery items. In order to establish standards of excellence and quality in materials and in the performance of men and machines, the company adheres to benchmarks during production. Moreover, its products are available in limited varieties, sizes and dimensions thereby eliminating superfluous diversity of products.

Identify the technique of scientific management which has been adopted by 'Study Buddy Pvt. Ltd.'

Q. 24. Tina and Anshu completed their MBA and started working in a multinational company at the same level. Both are working hard. Anshu has the habit of backbiting and wrong reporting about his colleagues to impress the boss. All the employees in the organization know about it. At the time of performance appraisal also Tina's performance was rated better than Anshu. Even then their boss decided to promote Anshu stating that being a female, Tina will not be able to handle the complications of higher post.

1. Identify and explain the principle of management that was not followed by this company.

2. Identify the values being ignore.

Q. 25. In one of his principles, Taylor suggested that job performance should be based on scientific enquiry and not on will/wish or personal intuition of manager?

1. Name that principle.

2. What values can be followed by using this principle?

Q. 26. The production department of Alpha Ltd. was not performing well on detailed analysis, it was observed that the workers of that department were overburdened. They were forced to work for longer hours without any break. So the management planned to replace the production manager. They appointed Mr. Hari as the new Production Manager. He observed the average

worker and note down their times. He noted down the time they worked and the time they required to be fresh to join back the work. Based on this observation, he set the break intervals for workers. He gave small breaks to workers to recharge their energy.

1. Name and explain the technique of scientific management used by Mr. Hari.

2. State the value which Mr. Hari wants to communicate to the society by allowing rest intervals to workers.

Q. 27. In the staff meeting the principal of the school raised objection that teachers start the teacher after 5 to 10 minutes in third floor classes. He warned them as students are complaining about this. The teachers explained the principal that when we climb steps from ground to third floor. We get some tiredness and need 5 to 10 minutes rest before starting the lecture. The principal planned to install a lift in school so that teachers do not waste their energy on wasteful activity of climbing steps.

1. State the techniques of scientific management used by principal.

2. State any other technique of scientific management.

Q. 28. In a factory the toolbox was kept under the table of every worker, whenever worker needs tools he had to bend tape out tool from tool box and keep it back after use. The newly appointed supervisor observed it and suggested to keep a stool near every worker's chain where toolbox can he placed so that workers do not waste their energy in bending again and again.

1. Which technique of scientific management is used by New Supervisor.

2. State the objective of motion study.

Q. 29. Mr. Mukesh used to manufacture shoes by employing labour who were easily available. When his son after completing his MBA joined the business, he analysed that if we use capital intensive method by using a machine it will reduce the cost and the quality of shoes will also improve.

1. Which technique of Scientific management is used by his son.

2. What is the objective of that technique.

Q. 30. Mr. Kapoor, Finance manager of ABC Ltd. applied for leave to attend a family function in Amritsar. The director of the company requested him to cancel his leave as there is an important meeting schedule on that date. Mr. Kapoor immediately agreed and cancelled his trip as he thought attending meeting is more important for company's benefit.

1. Which principle of Fayol is applied by Mr. Kapoor?

2. Explain that principle.

Q. 31. The manager of ABC Ltd. asked his workers to work overtime to increase the production and earn more but he did not paid extra wages to workers for extra time worked. The workers started feeling dissatisfied and stop contributing maximum.

1. Which principle of Fayol is violated in the above case.

2. Explain that principles.

Q. 32. Mr. Rajiv is the owner of 'Laxmi Dairy.' He is producing various milk products. He always tests various ways of producing different products and chooses the best and most economical way of production. He is also very particular about fixing a place for everything and he makes sure that all the employees are given a fixed place so that there is no wastage of time and delay in production.

1. Which technique of scientific management is applied by Mr. Rajiv?

2. Which principle of Henry Fayol is followed by him?Q. 33. Mr. Rajiv the senior manager of Unique enterprise considered himself very wise and used to take all the decisions himself without consulting the employees, he never used to help any one nor he used to take help of anyone. The employees of unique enterprise were not working efficiently and company's profit margin started declining to tackle the problem, the company appointed a new manager from IIM Bangalore. The new manager after joining made a policy that all the decisions will be taken after consulting employees in the meeting. All employees must give some suggestions and best suggestions will be rewarded with financial and nonfinancial incentives. This policy had a very positive effects on company.

1. State the principle of Hencry Fayol used by new manager.

2. State the technique of scientific management related to above case.

Q. 34. In a school principal makes sure that every instruction, order or information given by him must be passed to vice-principal then Head of the department and then to teachers and students must be informed by respective teachers only. He never allows teachers to directly communicate with him.

1. Stat the Principle of Henry Fayol followed by the school principal.

2. In case of emergency which concept of Scalar Chain can be used by teacher to pass urgent message directly to principal.

Q. 35. Pawan is working as a Production Manager in CFL Ltd. which manufactures CFL bulbs. There is no class-conflict between the management and workers. The working conditions are very good. The company is earning huge profits. As a policy, the management shares the profits earned with the workers because they believe in the prosperity of the employees.

1. State the principle of management described in the above paragraph.

2. Identify any two values which the company wants to communicate to society.

Q. 36. The principles of Taylor and Fayol are mutually complementary. On believed that management should share the gains with the workers while the other suggested that employees' compensation should depend on the earning capacity of the company and should give them a reasonable standard of living.

Identify and explain the principles of Fayol and Taylor referred to in the above paragraph.

Q. 37. The principles of Taylor and Fayol are mutually complementary. One believed that management should not close its ears to constructive suggestions made by the employees while the other suggested that a good company should have an employee suggestion system whereby suggestions which result in substantial time or cost reduction should be rewarded.

Identify and explain the principles of Taylor and Fayol referred to in the above paragraph.

Q. 38. Hina and Harish are typists in a company having the same educational qualifications. Hina gets Rs. 3,000 per month and Harish gets Rs. 4,000 per month as salaries for the same working hours. Which principle of management is being violated in this case? Name and explain the principle.

Q. 39. Rajveer works as a plant superintendent in a carpet making factory. In order to complete the export orders on time, the production manager asks him to make the workers work over time whereas the finance manager is strictly against this practice because it will increase the cost of production. Moreover, Rajveer feels that since the company is manufacturing handmade carpets as well as machine made carpets there is a lot of overlapping of activities. Therefore, there should be two separate divisions for both of them wherein each division should have its own in charge, plans and execution resources.

In context of the above case:

1. Identify and explain the principle of management which is being violated.

2. Also identify the principle of management that Rajveer feels should be implemented in the factory.

3. Give any two differences between the principle of management as identified in part (a) and part (b) respectively.

Q. 40. Gurpreet is running a retail mart in Varanasi to provide various types of products of daily use under one roof to the buyers. The employee turnover in his business is very high and he is perpetually on a look out for new staff. The fact of the matter is that he lacks managerial skills and

assigns work to his employees on adhoc basis without letting them settle down in a specific work. This approach of his creates a sense of insecurity among the employees and they tend to leave the job very quickly. However, he is a very god fearing person and offers fair wages to his employees so they can afford a reasonable standard of living.

In context of the above case:

1. Identify and explain the principle of management which Gurpreet is unable to apply and is perpetually ona look out for new staff.

2. "He is a very god fearing person and offers fair wages to his employees so they can afford a reasonable standard of living." Name and explain the relevant principle of management will have been brought into effect by Gurpreet.

Q. 41. After finishing her BBA degree course, Tanya gets a job of Assistant Manager in a retail company through the reference of her cousin Taruna who works in the same company as a Senior Manager. Taruna decides to guide Tanya through her experience by making her aware of the important facts about management in practice. She tells her that neither the principles of management provide any readymade, straitjacket solutions to all managerial problems nor they are not rigid prescriptions, which have to be followed absolutely.

In context of the above case:

1. Identify the two features of principles of management mentioned in the above paragraph by quoting lines from the paragraph.

2. Why do the principles of management not provide readymade, straitjacket solutions to all managerial problems?

Q. 42. Raj and Simran are both qualified eye surgeons and good friends. After obtaining a certificate of practice, they decide to persue a career of their own choice. Raj starts an eye care centre in the city whereas Simran joins a government hospital in a small village. They meet after a long time in a party. Raj invites Simran to visit his eye care centre and she accepts his invitation. She observes at his clinic that there is a fixed place for everything and everyone and it is present there so that there is no hinderance in the activities of the clinic. Also, Raj always tends to replace 'I' will 'We' in all his conversations with the staff members. Later on Raj shares with her that he always deals with lazy staff sternly to send the message that everyone is equal in his eyes.

In context of the above case:

1. Identify and explain the various principles of management that Raj is applying for the successful management of his eye care centre.

2. List any two values that Simran wants to communicate to the society by taking up a job in a village.

Q. 43. Anshul owns a small scale factory where utility items are prepared from waste material like paper mache items, paper and cloth bags, decorative material etc. over the past few weeks, he was observing that the productivity of one of his very efficient worker, Ramdas, is going down. So he decides to probe into the matter and confronts Ramdas one day. On being asked, Ramdas shares with Anshul that he has deliberately slowed down in his work as many of the less efficient workers often pull his leg saying that there is no need for him to be more efficient when everybody is being paid at the same rate. Taking a lesson from this insight, Anshul decides to implement an incentive bonus plan so

as differentiate between efficient and inefficient workers.

In context of the above case:

1. Name and explain the incentive bonus plan that Anshul may implement so as differentiate between efficient and inefficient workers.

2. State any two values that Anshul wants to communicate to the society by setting up a special type of business.

Q. 44. Swaraj is running an office furniture showroom. Most of his clients are businessmen and they prefer to buy goods on credit. Keeping this in mind, he has given the power to the sales manager, Mr. Bhardwaj, to offer a credit period of only 20 days, while negotiating a deal with a buyer. On a specific day, Mr. Bhardwaj finds that if he can offer a credit period of 30 days as an exception to a prospective buyer, he is likely to finalize a highly profitable deal for the business. So Mr. Bhardwaj requests Swaraj to grant him additional authority for offering a credit period of 30 days in the interest of the business. But swaraj refuses to extend his authority and as a result, the deal is not finalized.

In context of the above case:

1. Can Mr. Bhardwaj be held responsible for loss of the deal? Why or why not? Give a suitable reason in support of your answer.

2. Also, explain the related principle.

MATHEMATICS (041)

MCQ & Assertion Reason & Case Study (Matrices and Determinants)

MCQ (1 Marks)

1. If a matrix has 6 elements, then number of possible orders of the matrix can be

(a) 2
(b) 4
(c) 3
(d) 6

2. Total number of possible matrices of order 2 × 3 with each entry 1 or 0 is

(a) 6
(b) 36
(c) 32
(d) 64

3. If A is a square matrix such that $A^2=A$, then $(I + A)^2 - 3A$ is

(a) I
(b) 2A
(c) 3I
(d) A

4. If matrices A and B are inverse of each other then

(a) AB = BA

(b) AB = BA = I
(c) AB = BA = 0
(d) AB = 0, BA = I

5. The diagonal elements of a skew symmetric matrix are
(a) all zeroes
(b) are all equal to some scalar k(≠ 0)
(c) can be any number
(d) none of these

6. If a matrix A is both symmetric and skew symmetric then matrix A is
(a) a scalar matrix
(b) a diagonal matrix
(c) a zero matrix of order n × n
(d) a rectangular matrix

7. A = [aij]m × n is a square matrix, if

(A) $m < n$ (B) $m > n$ (C) $m = n$ (D) None of these .

8. The number of all possible matrices of order 3x3 with each entry 0 or 1 is:

(a) 27 (b) 18 (c) 81 (d) 512

9. The restriction on n, k and p so that PY + WY will be defined are:

(A) $k = 3, p = n$ (B) k is arbitrary, $p = 2$
(C) p is arbitrary, $k = 3$ (D) $k = 2, p = 3$

10. If $n = p$, then the order of the matrix 7X – 5Z is:

(A) p × 2 (B) 2 × n

(C) n × 3 (D) p × n

11. If A, B are symmetric matrices of same order, then AB – BA is a

(A) Skew symmetric matrix (B) Symmetric matrix

(C) Zero matrix (D) Identity matrix

12. If A= , then A+A'= I, if the value of θ is: $\begin{bmatrix} Cos\theta & -Sin\theta \\ Sin\theta & Cos\theta \end{bmatrix}$

(A) $\frac{\pi}{6}$ (B) $\frac{\pi}{3}$

(C) π (D) $\frac{3\pi}{2}$

13. If the matrix A is both symmetric and skew symmetric, then

(A) A is a diagonal matrix (B) A is a zero matrix

(C) A is a square matrix (D) None of these

14. If A is square matrix such that A2 = A, then $(I + A)^3 - 7A$ is equal to

(A)A (B) I – A (C) I (D) 3A

Question 15.
Assertion(A) : Only square Matrices can be multiplied
Reason(R) : Square matrices have the same order

a) Assertion is true and Reason is true . Reason is correct explanation for Assertion.
b) Assertion is true and Reason is true . Reason is not the correct explanation for Assertion.
c) Assertion is true and Reason is false.
d) Assertion is false but Reason is true.

Question 16.
Assertion(A) : A Square matrix can be expressed as sum of two different Matrix
Reason(R) : These matrices essentially are symmetric and skew symmetric

a) Assertion is true and Reason is true . Reason is correct explanation for Assertion.
b) Assertion is true and Reason is true . Reason is not the correct explanation for Assertion.
c) Assertion is true and Reason is false.

d) Assertion is false but Reason is true.

Continuity & Differentiability

MCQ (12 x 1 = 12)

1. *The derivative of function f(x) = $\sin^{-1}(\cos x)$ at x =0 is* _____

(a) 1 (b) 0 (c) -1 (d)not defined

2. *The function f(x) = [x] ,where [x] denotes the greatest integer function is*

(a) Continuous at integer points only

(b) continuous at everywhere

(c)continuous at non-integer points only

(d) differentiable everywhere

3. *The function f(x) = |cos □| is*

(a) differentiable at x = (2n+1) $\pi/2$, nϵ *Z*

(b) *continuous but not differentiable at x = (2n+1) $\pi/2$,n□ □*

(c) differentiable for all x but not continuous at some x

(d) None of these

4. The function $\frac{4-x^2}{4x-x^3}$

(a) continuous at x=0

(b) discontinuous at two point

(c) discontinuous at three points

(d) none of the above

5. The set of points where the function f(x)= mod(2x-1)sin x is differentiable are

(a) R={1/2}

(b) R

(c) (0,∞)

(d) None

6. The function f(x)= $e^{\text{mod } x}$ is

(a) continuos everywhere but not differentiable at 0

(b) continuos and differentiable everywhere

(c) not continuos at 0

(d) None

7. f(x)= mod sin x is

(a) everywhere differentiable

(b) everywhere continuos but not differentiable x=nπ where n∈Z

(c) not continuos at 0

(d) None

8. The function f(x) = x-[x], where [x] denotes the greatest integer function is

(a) continuous at integer points only *(b) continuous at everywhere*

(c)continuous at non integer points only (d) differentiable at everywhere

9. The derivative of function f(x) = $\sin^{-1}(\cos x)$ at x =0 is ----------

(a)1 (b) 0 (c) -1 (d)not defined

10. y= a sin x + b cos x, then prove that $y'' + y =$

(a) 0 (b) 0 (c) -1 (d)not defined

Q11. Assertion(A) : A continuous function is differentiable at all points

Reason(R) : $\lim_{x\to a^+} f(a) = f(a) = \lim_{x\to a^-} f(a)$ x=a

a) Assertion is true and Reason is true .

Reason is correct explanation for Assertion.

b) Assertion is true and Reason is true .
Reason is not the correct explanation for Assertion.

c) Assertion is true and Reason is false.

d) Assertion is false but Reason is true.

Q12. Assertion(A) : Limits and Continuity are same

Reason(R) : We check for limits for determining continuity

a) Assertion is true and Reason is true .
Reason is correct explanation for Assertion.

b) Assertion is true and Reason is true .
Reason is not the correct explanation for Assertion.

c) Assertion is true and Reason is false.

d) Assertion is false but Reason is true.

CASE STUDY (4 marks)

Matrices and Determinants

Q1.Two schools P and Q want to award their selected students on the values of Tolerance, Kindness, and Leadership. The school P wants to award Rs x each, Rs y each and Rs z each for the three respective values to 3, 2 and 1 students respectively with total award money of Rs.
2200.

School Q wants to spend Rs 3100 to award its 4, 1 and 3 students on the respective values (by giving the same award money to the three values as school P). If the total amount of award for one prize on each value is Rs1200, using matrices, find the following:

1. What is award money for Tolerance?
    1. 350
    2. 300
    3. 500
    4. 400
2. What is the award money for Leadership?
    1. 300
    2. 280
    3. 450
    4. 500
3. What is the award money for Kindness?
    1. 500
    2. 400
    3. 300
    4. 550
4. If a matrix A is both symmetric and skew-symmetric, then
    1. A is a diagonal matrix
    2. A is a scalar matrix
    3. A is a zero matrix
    4. A is a square matrix
5. If A and B are two matrices such that AB = B and BA = A, then B^2 is equal to
    1. B
    2. A
    3. 1
    4. 0

Q2.Read the case study carefully and answer any four out of the following questions: Three friends Ravi, Raju and Rohit were buying and selling stationery items in a market. The price of per dozen of Pen, notebooks and toys are Rupees x, y and z respectively.

Ravi purchases 4 dozen of notebooks and sells 2 dozen pens and 5 dozen toys. Raju purchases 2 dozen toys and sells 3 dozen pens and 1 dozen of notebooks. Rohit purchases one dozen of pens and sells 3 dozen notebooks and one dozen toys.

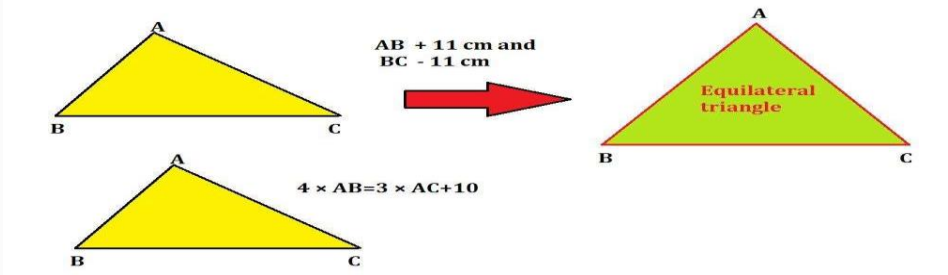
In the process, Ravi, Raju and Rohit earn ₹ 1500, ₹ 100 and ₹400 respectively.

1. What is the price of one dozen of pens?
   1. ₹ 100
   2. ₹ 200
   3. ₹ 300
   4. ₹ 400

2. What is the total price of one dozen of pens and one dozen of notebooks?
   1. ₹ 100
   2. ₹ 200
   3. ₹ 300
   4. ₹ 400
3. What is the sale amount of Ravi?
   1. ₹ 1000
   2. ₹ 1100
   3. ₹ 1300
   4. ₹ 1200
4. What is the amount of purchases made by all three friends?
   1. ₹ 1200
   2. ₹ 1500
   3. ₹ 1300
   4. ₹ 1400

5. What is the price of sales made by all three friends?
   1. ₹ 3000
   2. ₹ 2500
   3. ₹ 2700
   4. ₹ 2400

Q3.Read the case study carefully and answer any four out of the following questions: Once a mathematics teacher drew a triangle ABC on the blackboard. Now he asked Jose," If I increase AB by 11 cm and decrease the side BC by 11 cm, then what type of triangle it would be?"
Jose said, "It will become an equilateral triangle."



Again teacher asked Suraj," If I multiply the side AB by 4 then what will be the relation of this with side AC?"
Suraj said it will be 10 cm more than the three times AC.

Find the sides of the triangle using the matrix method and answer the following questions

1. What is the length of the smallest side?
    1. 54 cm
    2. 43 cm
    3. 30 cm
    4. 35 cm
2. What is the length of the largest side?
    1. 54 cm
    2. 43 cm
    3. 65 cm
    4. 35 cm
3. What is the perimeter of the triangle?
    1. 150 cm
    2. 160 cm
    3. 165 cm
    4. 162cm
4. What is the side of the equilateral triangle formed?
    1. 54 cm
    2. 43 cm
    3. 30 cm
    4. 35 cm
5. What is the order of the matrix formed?
    1. 3 × 3
    2. 2 × 3
    3. 3 × 2
    4. 2 × 2

Continuity & Differentiability

A potter made a mud vessel, where the shape of the pot is based on $f(x) = |x - 3| + |x-2|$, where f(x) represents the height of the pot.

1. When $x > 4$ What will be the height in terms of x ?

a. $x - 2$

b. $x - 3$

c. $2x - 5$

d. $5 - 2x$

2. Will the slope vary with x value?

a. Yes

b. No

3. What is $\frac{dy}{dx}$ at $x = 3$

a. 2

b. -2

c. Function is not differentiable

d. 1

4. When the x value lies between (2,3) then the function is

a. $2x - 5$

b. $5 - 2x$

c. 1

d. 5

5. If the potter is trying to make a pot using the function f(x) = [x] ,will he get a pot or not? Why?

a. Yes, because it is a continuous function

b. Yes, because it is not continuous

c. No , because it is a continuous function

d. No , because it is not continuous

Continuity & Differentiability

Long Answer Type Questions

1. Find the value of k, so that the function *f* defined below, is continuous at x = 0, where

$$f(x) = \begin{cases} \left(\frac{1-\cos 8x}{x^2}\right), & \text{if } x \neq 0 \\ k, & \text{if } x = 0 \end{cases}$$

All India 2014C

2. If $f(x) = \begin{cases} \left(\frac{1-\cos 4x}{\sqrt{16+\sqrt{x}-4}}\right), & when\ x < 0 \\ a, & when\ x = 0 \\ \frac{\sqrt{x}}{\sqrt{16+\sqrt{x}-4}}, & when\ x > 0 \end{cases}$ and *f* is continuous at x = 0, then find the value of *a*.

Delhi 2013C

3. Find the value of k, for which $f(x) = \begin{cases} \frac{\sqrt{1+kx}-\sqrt{1-kx}}{x}, & \text{if } -1 \leq x < 0 \\ \frac{2x}{x+1}, & \text{if } 0 \leq x < 1 \end{cases}$ is continuous at x = 0.

All India 2013

4. Find the value of k, so that the function *f* defined by

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

HOTS; Delhi 2012C; Foreign 2011

5. Find the value of *a* for which the functions *f* is defined as $f(x) = \begin{cases} a\sin\left(x+1\right), & x \leq 0 \\ \frac{\tan x - \sin x}{x^3}, & x > 0 \end{cases}$

Delhi 2011

6. If the function f (x) given by $f(x) = \begin{cases} 3ax + b, & if\ x > 1 \\ 11, & if\ x = 1 \\ 5ax - 2b, & if\ x < 1 \end{cases}$ is continuous at x = 1, then find the values of a and b.

Delhi 2011; All India 2010

7. Find the values of a and b such that the following function f (x) is a continuous functions.

$f(x) = \begin{cases} 5, & x \le 2 \\ ax + b, & 2 < x < 10 \\ 21, & x \ge 10 \end{cases}$

Delhi 2011

8. Find the relationship between a and b so that the function f defined by $f(x) = \begin{cases} ax + 1, & if\ x \le 3 \\ bx + 3, & if\ x > 3 \end{cases}$ is continuous at x = 3.

All India 2011

9. Find the value of k, so that the function f defined by $f(x) = \begin{cases} kx + 1, if\ x \le \pi \\ \cos x, if\ x > \pi \end{cases}$ is continuous at x = π.

Foreign 2011

10. For what values of λ, is the function $f(x) = \begin{cases} (x^2 - 2x), if\ x \le 0 \\ 4x + 1, if\ x > 0 \end{cases}$ is continuous at x = 0?

Foreign 2011

11. Discus the continuity of the functions f (x) of x = ½, when f (x) is defined as follows:

$f(x) = \begin{cases} 1/2 + x, & 0 \le x < 1/2 \\ 1, & x = 1/2 \\ 3/2 + x, & 1/2 < x \le 1 \end{cases}$

Delhi 2011C

12. Find the value of a if the functions f (x) defined by $f(x) \begin{cases} 2x - 1 & x < 2 \\ a, & x = 2 \\ x + 1, & x > 2 \end{cases}$ is continuous at x = 2.

All India 2011C; Delhi 2009C

13. Find the values of a and b such that the functions defined as follows is continuous.

$f(x) = \begin{cases} x + 2, & x \le 2 \\ ax + b, & 2 < x < 5 \\ 3x - 2, & x \ge 5 \end{cases}$

Delhi 2010, 2010C

14. For what of k, is the functions defined by $f(x) = \begin{cases} k(x^2 + 2), if\ x \le 0 \\ 3x + 1, if\ x > 0 \end{cases}$, continuous at x = 0?

Also, write whether the function is continuous at x = 1.

All India 2010, 2010C

15. Find all points of discontinuity of f, where f is defined as follows:

$$f(x)\begin{cases} |x|+3, & x \le -3 \\ -2x, & -3 < z < 3 \\ 6x+2, & x \ge 3 \end{cases}$$

Delhi 20110

16. Show that the function $f(x)$ defined by $f(x)=\begin{cases} \frac{\sin x}{x}+\cos x, & x>0 \\ \frac{2}{4(1-\sqrt{1-x})}, & x=0 \\ \frac{}{x}, & x<0 \end{cases}$ is continuous at x = 0.

All India 2009C

17. For what value of k, is the following function continuous at x = 2?

$$f(x)=\begin{cases} 2x+1, & x<2 \\ k, & x=2 \\ 3x-1, & x>2 \end{cases}$$

Delhi 2008

18. If $f(x)$ defined by the following, is continuous at x = 0, then find the values of a, b and c

$$f(x)=\begin{cases} \frac{\sin(a+1)x+\sin x}{x}, & if\ x<0 \\ c, & if\ x=0 \\ \frac{\sqrt{x+bx^2}-\sqrt{x}}{bx^{3/2}}, & if\ x>0 \end{cases}$$

HOTS; All India 2008

19. Show that $f(x)=\begin{cases} 5x-4, & when\ 0<x\le 1 \\ 4x^3-3x, & when\ 1<x<2 \end{cases}$ is continuous at x = 1

Delhi 2008C

20. If the following function $f(x)$ is continuous at x = 0, then the value of k.

$$f(x)=\begin{cases} \frac{1-\cos 2x}{2x^2}, & x\ne 0 \\ k, & x=0 \end{cases}.$$

All India 2008C

Short Answer Type Questions

1. Write the derivative of sin x with respect to cos x. **Delhi 2014C**

2. If cos y = x cos (a + y), where cos $a \ne \pm 1$, prove that $\frac{dy}{dx}=\frac{\cos^2(a+y)}{\sin a}$ **Foreign 2014**

3. If $y=\sin^{-1}\{x\sqrt{1-x}-\sqrt{x}\sqrt{1-x^2}\}$ and $0<x<1$, then find $\frac{dy}{dx}$. **All India 2014C**; **Delhi 2010**

4. If $e^x+e^y=e^{x+y}$, prove that $\frac{dy}{dx}+e^{y-x}=0$. **Foreign 2014**

5. Find the value of $\frac{dy}{dx}$ at $\theta=\frac{\pi}{4}$, if $x=ae^{\theta}(\sin\theta-\cos\theta)$ and $=ae^{\theta}(\sin\theta+\cos\theta)$. **All India 2014**

6. If $x=a(cost+\log\tan\frac{t}{2})$, $y=a\sin t$, then evaluate $\frac{d^2y}{dx^2}$ at $t=\frac{\pi}{3}$.

Delhi 2014C

7. If $x^m y^n = (x + y)^{m+n}$, prove that $\frac{dy}{dx} = \frac{y}{x}$.

Foreign 2014

8. If $x = a\cos\theta + b\sin\theta$ and $y = a\sin\theta - b\cos\theta$, show that $y^2\frac{d^2y}{dx^2} - x\frac{dy}{dx} + y = 0$.

Foreign 2014

9. Differentiate $\tan^{-1}\left(\frac{\sqrt{1-x^2}}{x}\right)$ w.r.t $\cos^{-1}(2x\sqrt{1-x^2})$, when $x \neq 0$.

Delhi 2014

10. If $y = x^x$, then prove that $\frac{d^2y}{dx^2} - \frac{1}{y}\left(\frac{dy}{dx}\right)^2 - y = 0$.

Delhi 2014

11. Differentiate $\tan^{-1}\left(\frac{x}{\sqrt{1-x^2}}\right)$ w.r.t $\sin^{-1}(2x\sqrt{1-x^2})$.

Delhi 2014

12. Differentiate $\tan^{-1}\left(\frac{\sqrt{1+x^2}-1}{x}\right)$ w.r.t. $\sin^{-1}\left(\frac{2x}{1+x^2}\right)$, when $x \neq 0$.

Delhi 2014

13. If $y = Pe^{ax} + Qe^{bx}$, then show that $\frac{d^2y}{dx^2} - (a + b)\frac{dy}{dx} + aby = 0$.

All India 2014, 2009C

14. If $x = \cos t\,(3 - 2\cos^2 t)$ and $y = \sin t\,(3 - 2\sin^2 t)$, then find the value of $\frac{dy}{dx}$ at $t = \frac{\pi}{4}$.

All India 2014

15. If $(x - y)e^{x-y} = a$. Prove that $y\frac{dy}{dx} + x = 2y$.

Delhi 2014C

16. If $x = a(\cos t + t\sin t)$ and $y = a(\sin t - t\cos t)$, then find the value of $\frac{d^2y}{dx^2}$ at $t = \frac{\pi}{4}$.

Delhi 2014C

17. If $y = \tan^{-1}\left(\frac{a}{x}\right) + \log\sqrt{\frac{x-a}{x+a}}$, prove that $\frac{dy}{dx} = \frac{2a^3}{x^4 - a^4}$.

All India 2014C

18. If $x = a\sin 2t\,(1 + \cos 2t)$ and $y = b\cos 2t\,(1 - \cos 2t)$, then show that at $t = \frac{\pi}{4}$, $\left(\frac{dy}{dx}\right) = \frac{b}{a}$.

All India 2014

19. If $(\tan^{-1} x)^y + y^{\cot x} = 1$, then find dy/dx.

All India 2014C

Long Answer Type Questions

20. If $x = 2\cos\theta - \cos 2\theta$ and $y = 2\sin\theta - \sin 2\theta$, then prove that $\frac{dy}{dx} = \tan\left(\frac{3\theta}{2}\right)$.

Delhi 2013C

21. If $y = (\sin x)^x + \sin^{-1}\sqrt{x}$, then find $\frac{dy}{dx}$.

Delhi 2013C 2009; All India 2009C

22. If $y = x\log\left(\frac{x}{a+bx}\right)$, then prove that $x^3\frac{d^2y}{dx^2} = \left(x\frac{dy}{dx} - y\right)^2$.

Delhi 2013C

23. Differentiate the following function with respect to x. $(\log x)^x + x^{\log x}$

Delhi 2013

24. If $y = \log\left[x + \sqrt{x^2 + a^2}\right]$ then show that $(x^2 + a^2)\frac{d^2y}{dx^2} + x\frac{dy}{dx} = 0$.

Delhi 2013

25. Show that the function $f(x) = |x - 3|$, $x \in R$, is continuous but not differentiable at x = 3.

Delhi 2013

26. If $x = a\sin t$ and $y = a(\cos t + \log\tan(t/2))$, then find $\frac{d^2y}{dx^2}$.

Delhi 2013

27. Differentiate $\sin^{-1}\left[\frac{2^{x+1}3^x}{1+(36)^x}\right]$ with respect to x

HOTS; All India 2013

28. If $x = a\cos^3\theta$ and $y = a\sin^3\theta$, then find the value of $\frac{d^2y}{dx^2}$ at $\theta = \frac{\pi}{6}$

All India 2013

29. If $x\sin(a + y) + \sin a\cos(a + y) = 0$, then prove that $\frac{dy}{dx} = \frac{\sin^2(a+y)}{\sin a}$

All India 2013, 2011, 2010

30. If $x^y = e^{x-y}$, then prove that $\frac{dy}{dx} = \frac{\log x}{(1+\log x)^2}$ or $\frac{dy}{dx} = \frac{\log x}{\{\log(xe)\}^2}$

All India 2013, 2011, 2010

31. If $y^x = e^{y-x}$, then prove that $\frac{dy}{dx} = \frac{(1+\log y)^2}{\log y}$

All India 2013

32. If $(\cos x)^y = (\cos y)^x$, then find $\frac{dy}{dx}$.

HOTS; Delhi 2012

33. If $\sin y = x\sin(a + y)$, then prove that $\frac{dy}{dx} = \frac{\sin^2(a+y)}{\sin a}$

HOTS; Delhi 2012

34. If $x = \sqrt{a^{\sin^{-1}t}}$ and $y = \sqrt{a^{\cos^{-1}t}}$, then show that $\frac{dy}{dx} = \frac{-y}{x}$.

All India 2012

35. Differentiate $\tan^{-1}\left[\frac{\sqrt{1+x^2}-1}{x}\right]$ w.r.t.x.

HOTS; All India 2012

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

Delhi 2012

37. if $y = x^{\sin x - \cos x} + \frac{x^2-1}{x^2+1}$, then find $\frac{dy}{dx}$

Delhi 2012C

38. If $x = a(\cos t + t\sin t)$ and $y = a(\sin t - t\cos t)$, then find $\frac{d^2y}{dx^2}$ *and* $\frac{d^2y}{dt^2}$

Delhi 2012C

39. Find $\frac{dy}{dx}$, when $y = x^{\cot x} + \frac{2x^2-3}{x^{2+x+2}}$ **All India 2012C**

40. If x = cos$t$ + log tan $\frac{t}{2}$ and y = sin$t$, then find the values of $\frac{d^2y}{dt^2}$ and $\frac{d^2y}{dx^2}$ at $t = \frac{\pi}{4}$.

All India 2012C

41. If $x\sqrt{1+y} + y\sqrt{1+x} = 0$, $(x \neq y)$, then prove that $\frac{dy}{dx} = -\frac{1}{(1+x)^2}$.

HOTS; Foreign 2012; Delhi 2011C

42. If $x = \tan\left(\frac{1}{a}\log y\right)$, then show that $(1+x^2)\frac{d^2y}{dx^2} + (2x-a)\frac{dy}{dx} = 0$.

All India 2011

43. Differentiate $x^{x\cos x} + \frac{x^2+1}{x^2-1}$ w.r.t.x.

Delhi 2011

44. If $x = a(\theta - \sin\theta)$, $y = a(1+\cos\theta)$, then find $\frac{d^2y}{dx^2}$.

Delhi 2011

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

Foreign 2011

46. If $y = \log\left[x + \sqrt{x^2+1}\right]$, then prove that $(x^2+1)\frac{d^2y}{dx^2} + x\frac{dy}{dx} = 0$.

Foreign 2011

47. If $\log\left(\sqrt{1+x^2} - x\right) = y\sqrt{1+x^2}$, then show that $(1+x^2)\frac{dy}{dx} + xy + 1 = 0$.

All India 2011C

48. If $x = a(\theta + \sin\theta)$ and $y = a(1-\cos\theta)$, then find $\frac{d^2y}{dx^2}$.

All India 2011C

49. If $y = a\sin x + b\cos x$, then prove that $y^2 + \left(\frac{dy}{dx}\right)^2 = a^2 + b^2$.

All India 2011C; HOTS

50. if $x = a(\cos\theta + \theta\sin\theta)$ and $y = a(\sin\theta - \theta\cos\theta)$, then find $\frac{d^2y}{dx^2}$

All India 2011C, 2008

51. If $x = a(\theta - \sin\theta)$ and $y = a(1+\cos\theta)$, then find $\frac{dy}{dx}$ at $\theta = \frac{\pi}{3}$

Delhi 2011C

52. If $y = (\sin x - \cos x)^{(\sin x - \cos x)}$, $\frac{\pi}{4} < x < \frac{3\pi}{4}$, then find $\frac{dy}{dx}$

All India 2010C

53. If $y = \cos^{-1}\left[\frac{2x - 3\sqrt{1-x^2}}{\sqrt{13}}\right]$, then find $\frac{dy}{dx}$.

All India 2010C

54. If $y = (\cot^{-1}x)^2$, then show that $(x^2+1)^2\frac{d^2y}{dx^2} + 2x(x^2+1)\frac{dy}{dx} = 2$

Delhi 2010C

55. If $y = \text{cosec}^{-1}x$, $x > 1$, then show that $x(x^2-1)\frac{d^2y}{dx^2} + (2x^2-1)\frac{dy}{dx} = 0$.

All India 2010

56. If $y = \cos^{-1}\left(\frac{3x+4\sqrt{1-x^2}}{5}\right)$, then find $\frac{dy}{dx}$.

All India 2010

57. Show that the function defined as follows, is continuous at x = 1, x = 2 but not differentiable at x = 2 $f(x)\begin{cases} 3x-2, & 0 < x \le 1 \\ 2x^2-2, & 1 < x \le 2. \\ 5x-4, & x > 2 \end{cases}$

Delhi 2010

58. If $y = e^{a\cos^{-1}x}$, $-1 \le x \le 1$, then show that $(1-x^2)\frac{d^2y}{dx^2} - x\frac{dy}{dx} - a^2y = 0$.

All India 2010

59. Find $\frac{dy}{dx}$, if $y = (\cos x)^x + (\sin x)^{1/x}$.

Delhi 2010

60. If $y = e^x \sin x$, then prove that $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + 2y = 0$.

All India 2010C

61. If $y = (x)^x + (\sin x)^x$, then find $\frac{dy}{dx}$.

All India 2010C

62. If $y = 3\cos(\log x) + 4\sin(\log x)$, then show that $x^2\frac{d^2y}{dx^2} + x\frac{dy}{dx} + y = 0$.

All India 2009, 2009C

63. If $y = (x)^{\sin x} + (\log x)^x$, then find $\frac{dy}{dx}$.

Delhi 2009

64. If $x = a\left(\cos\theta + \log\tan\frac{\theta}{2}\right)$ and $y = a\sin\theta$, the find the value of $\frac{d^2y}{dx^2}$ at $\theta = \frac{\pi}{4}$.

Delhi 2009C

65. If $y = (\log x)^x + (x)^{\cos x}$, then find $\frac{dy}{dx}$.

Delhi 2009C

66. If $y = e^x(\sin x + \cos x)$, then show that $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + 2y = 0$.

Delhi 2009

67. If $y = \frac{\sin^{-1}x}{\sqrt{1-x^2}}$, then show that $(1-x^2)\frac{d^2y}{dx^2} - 3x\frac{dy}{dx} - y = 0$.

All India 2009

68. Differentiate the following function w.r.t.x. $(x)^{\cos x} + (\sin x)^{\tan x}$

Delhi 2009

69. Differentiate the following functions w.r.t.x. $x^{\sin x} + (\sin x)^{\cos x}$

Delhi 2009

70. If $y = x^{\cot x} + (\sin x)^x$, then find $\frac{dy}{dx}$.

All India 2008C

71. If $xy + y^2 = \tan x + y$, then find $\frac{dy}{dx}$

All India 2008C

72. If $y = (\log x)^{\cos x} + \frac{x^2+1}{x^2-1}$, then find $\frac{dy}{dx}$

Delhi 2008C

73. If $y = \sin^{-1}\left[\frac{5x+12\sqrt{1-x^2}}{13}\right]$, then find $\frac{dy}{dx}$.

HOTS; All India 2008C

74. If $y = \cot^{-1}\left[\frac{\sqrt{1+\sin x}+\sqrt{1-\sin x}}{\sqrt{1+\sin x}-\sqrt{1-\sin x}}\right]$ $0<x<\frac{\pi}{2}$, then find $\frac{dy}{dx}$

HOTS; Delhi 2008

75. If $y = \sqrt{x^2+1}\,\log\left(\frac{1}{x} + \sqrt{1+\frac{1}{x^2}}\right)$, then find $\frac{dy}{dx}$.

Delhi 2008

76. Differentiate $\tan^{-1}\left(\frac{\sqrt{1+x}-\sqrt{1-x}}{\sqrt{1+x}+\sqrt{1-x}}\right)$ w.r.t.x.

Delhi 2008

ANSWERS (Continuity)

1. k=1 **2.** a = 8 **3.** k= −1 **4.** k=6 **5.** a=1/2 **6.** a=3 and b=2

7. a=2 and b=1 **8.** 3a-3b =2 **9.** $k=-\frac{2}{\pi}$ **10.** No real value of x

11. f(x) is discontinuous at x =1/2 **12.** a = 3 **13.** a=3 and b = −2

14. $k=\frac{1}{2}$, f(x) is continuous at x =1. **15.** x = 3 is the point of discontinuity of f(x). **17.** k=5

18. a=-3/2, c=1/2 and b may take any real value. **20.** k=1

ANSWERS (Differentiability)

1. $-\cot x$ **3.** $\frac{dy}{dx} = \frac{1}{\sqrt{1-x^2}} - \frac{1}{2\sqrt{(x-x^2)}}$ **5.** $\frac{dy}{dx} = 1$ **6.** $\frac{d^2y}{dx^2} = \frac{8\sqrt{3}}{a}$

8. $-\frac{1}{2}$ **11.** $\frac{1}{2}$ **12.** $\frac{1}{4}$ **14.** 0 **16.** $\left(\frac{d^2y}{dx^2}\right) = \frac{8\sqrt{2}}{a\pi}$

19 $\frac{dy}{dx} = -\left[\frac{y}{1+x^2}(\tan^{-1}x)^{y-1} - y^{\cot x}\operatorname{cosec}^2 x \log y\right] \Big/ \left[(\tan^{-1}x)^y \log(\tan^{-1}x) + \cot x \cdot y^{\cot x - 1}\right]$

21. $\frac{dy}{dx} = (\sin x)[x\cot x + \log\sin x]$ **23.** $(\log x)^x\left\{\frac{1}{\log x} + \log(\log x)\right\} + 2\left(\frac{\log x}{x}\right)x^{\log x}$

26. $-\frac{\operatorname{cosec}^2 t}{2a\cos t}$ **27.** $\left[\frac{2^{x+1}.3^x}{1+(36)^x}\right]\log 6$ **32.** $\frac{dy}{dx} = \frac{8.3}{27a}$ **35.** $\frac{dy}{dx} = \frac{\log(\cos y)+y\tan x}{x\tan y + \log(\cos x)}$

$\frac{1}{2(1+x^2)}$ **37.** $x^{\sin x-\cos x}\left[\frac{\sin x-\cos x}{x} + \log x(\cos x+\sin x) + \frac{4x}{(x^2+1)^2}\right]$

38. $\frac{\sec^3 t}{at}$, $a(\sin t + t\cos t)$ **39.** $x^{\cot x}\left(\frac{\cot x}{x} - \operatorname{cosec}^2 . \log x\right) + \frac{2x^2+14x+3}{(x^2+x+2)^2}$ **40.** $\frac{-1}{\sqrt{2}}, 2\sqrt{2}$

43. $\frac{dy}{dx} = x^{x\cos x}[\cos x - x\log x\sin x + \log x\cos x] - \frac{4x}{(x^2-1)^2}$ **44.** $\frac{1}{4a}\operatorname{cosec}^4\frac{\theta}{2}$

48. $\frac{1}{4a}\sec^4\frac{\theta}{2}$ **50.** $\frac{7}{a\theta}\sec^3\theta$ **51.** $-\sqrt{\cdot}$

52. $\frac{dy}{dx} = (\sin x - \cos x)^{(\sin x-\cos x)}(\cos x+\sin x)[1+\log(\sin x-\cos x)]$

53. $\frac{dy}{dx} = \frac{-1}{\sqrt{1-x^2}}$ **56.** $\frac{dy}{dx} = \frac{1}{\sqrt{1-x^2}}$

59. $\frac{dy}{dx} = (cos\ x)^x\ [-x\ tan\ x + log\ cos\ x] + (sin\ x)^{1/x}\ [\frac{\cot x}{x} - \frac{\log(\sin x)}{x^2}]$

61. $\frac{dy}{dx} = x^x(1 + logx) + (sin\ x)^x(x\ cot\ x + log\ sin\ x)$

63. $\frac{dy}{dx} = x^{\sin x-1}[\sin x + x \log x \cos x] + (\log x)^{x-1}[1 + \log x - \log(\log x)]$

65. $(\quad)^{x-1}[1 + log\ x\ .\ (log\ x)] + x\ cos^{x-1}[cos\ x - x\ log\ x\ sin\ x]$

68. $x^{\cos x-1}[\cos x - x \log \sin x] + (\sin x)^{\tan x}[1 + sec^2x \log \sin x]$

69. $x^{\sin x-1}[\sin x + x \log x \cos x] + \sin x^{\cos x}[\cos x \cot x - \sin x \log (\sin x)]$

70. $x^{\cot x-1}[\cot x - x \log x \operatorname{cosec}^2 x] + (\sin x)^x [x \cot x + \log x \sin x]$ **71.** $\frac{dy}{dx} = \frac{\sec^2 x - y}{x+2y-1}$

72. $(\log x)^{\cos x}[\frac{\cos x}{x \log x} - \sin x \log(\log x) - \frac{4x}{(x^2-1)^2}]$ **73.** $\frac{1}{\sqrt{1-x^2}}$ **74.** $\frac{1}{2}$ **75.** $\frac{dy}{dx} = \frac{\sqrt{(1+x^2)}}{x}$

76. $\frac{dy}{dx} = \frac{1}{2\sqrt{(1-x^2)}}$

Matrices

Short Answer Type Questions

1. If $2\begin{bmatrix} 3 & 4 \\ 5 & x \end{bmatrix} + \begin{bmatrix} 1 & y \\ 0 & 1 \end{bmatrix} = \begin{bmatrix} 7 & 0 \\ 10 & 5 \end{bmatrix}$, then find $(x - y)$.
Delhi 2014

2. Solve the following matrix equation for x. $\begin{bmatrix} x & 1 \end{bmatrix} \begin{bmatrix} 1 & 0 \\ -2 & 0 \end{bmatrix} = 0$ **Delhi 2014**

3. If A is a square matrix such that $A^2 = A$, then write the value of $7A - (I + A)^3$, where I is an identity matrix.
All India 2014

4. If $\begin{bmatrix} y & z \\ 2x - y & w \end{bmatrix} = \begin{bmatrix} -1 & 4 \\ 0 & 5 \end{bmatrix}$, then find the value of x + y.
All India 2014

5. If $\begin{bmatrix} a + 4 & 2a + 2 \\ 3b & b + 2 \end{bmatrix} = \begin{bmatrix} 8 & -6 \\ 8 & a - 8b \end{bmatrix}$, write the value of a – 2b.
Foreign 2014

6. If $\begin{bmatrix} y & 4 \\ z + 6 & x + y \end{bmatrix} = \begin{bmatrix} 8 & w \\ 0 & 6 \end{bmatrix}$, write the value of (x + y + z).
Delhi 2014C

7. The elements of a_{ij} of a 3 × 3 matrix are given by $a_{ij} = \frac{1}{2}|-3i + j|$. Write the value of element a_{32}.

All India 2014C

8. If $[2x \quad 4]\begin{bmatrix} -8 \\ x \end{bmatrix} = 0$, find the positive value x.

All India 2014

9. If $2\begin{bmatrix} 1 & 3 \\ 0 & x \end{bmatrix} + \begin{bmatrix} y & 0 \\ 1 & 2 \end{bmatrix} = \begin{bmatrix} 5 & 6 \\ 0 & 18 \end{bmatrix}$, then find the value of (x + y).

Delhi 2013C; All India 2012

10. Find the value of a, if $\begin{bmatrix} a-b & 2a+c \\ 2a-b & 3c+d \end{bmatrix} = \begin{bmatrix} -1 & 5 \\ 0 & 13 \end{bmatrix}$

Delhi 2013

11. If $\begin{bmatrix} 9 & -1 & 4 \\ -2 & 1 & 3 \end{bmatrix} = A + \begin{bmatrix} 1 & 2 & -1 \\ 0 & 4 & 9 \end{bmatrix}$, then find the matrix A.

Delhi 2013

12. If matrix $A = \begin{bmatrix} 1 & -1 \\ -1 & 1 \end{bmatrix}$ and $A^2 = kA$, then write the value of k.

All India 2013

13. If matrix $A = \begin{bmatrix} 2 & -2 \\ -2 & 2 \end{bmatrix}$ and $A^2 = pA$, then write the value of p.

All India 2013

14. If matrix $A = \begin{bmatrix} 3 & -3 \\ -3 & 3 \end{bmatrix}$ and $A^2 = \lambda A$, then write the value of λ.

All India 2013

15. Simply $\cos\theta \begin{bmatrix} \cos\theta & \sin\theta \\ -\sin\theta & \cos\theta \end{bmatrix} + \sin\theta \begin{bmatrix} \sin\theta & -\cos\theta \\ \cos\theta & \sin\theta \end{bmatrix}$.

Delhi 2012; HOTS

16. Find the value of y – x from following equation

$$2\begin{bmatrix} x & 5 \\ 7 & y-3 \end{bmatrix} + \begin{bmatrix} 3 & -4 \\ 1 & 2 \end{bmatrix} = \begin{bmatrix} 7 & 6 \\ 15 & 14 \end{bmatrix}.$$

All India 2012

17. If $x\begin{bmatrix} 2 \\ 3 \end{bmatrix} + y\begin{bmatrix} -1 \\ 1 \end{bmatrix} = \begin{bmatrix} 10 \\ 5 \end{bmatrix}$, then write the value of x.

Foreign 2012

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

Delhi 2012C

19. Write the value of x – y + z from following equation $\begin{bmatrix} x+y+z \\ x+z \\ y+z \end{bmatrix} = \begin{bmatrix} 9 \\ 5 \\ 7 \end{bmatrix}$

Foreign 2011

20. Write the order of product matrix $[2]\ [2 \ 3 \ 4]$

Foreign 2011; HOTS

21. If a matrix has 5 elements, then write all possible orders it can have.

All India 2011

22. For a 2 × 2 matrix, A = $[a_{ij}]$ whose elements are given by $a_{ij} = i/j$, write the value of a_{12}.

Delhi 2011

23. If $\begin{bmatrix} x-y & 3 \\ 2x+y & 7 \end{bmatrix} = \begin{bmatrix} 1 \\ 8 & 7 \end{bmatrix}$, then find the value of y. **Delhi 2011C**

24. From the following matrix equation, find the value of x. $\begin{bmatrix} x+y & 4 \\ -5 & 3y \end{bmatrix} = \begin{bmatrix} 3 & 4 \\ -5 & 6 \end{bmatrix}$

Foreign 2010

25. Find x from the matrix equation $\begin{bmatrix} 1 & 3 \\ 4 & 5 \end{bmatrix} \begin{bmatrix} x \\ 2 \end{bmatrix} = \begin{bmatrix} 5 \\ 6 \end{bmatrix}$.

Foreign 2010; HOTS

26. If $\begin{bmatrix} 3 & 4 \\ 2 & x \end{bmatrix} \begin{bmatrix} x \\ 1 \end{bmatrix} = \begin{bmatrix} 19 \\ 15 \end{bmatrix}$, then find the value of x.

Foreign 2010; HOTS

27. If $A = \begin{bmatrix} \cos\alpha & -\sin\alpha \\ \sin\alpha & \cos\alpha \end{bmatrix}$, then for what value of □, A is an identity matrix?

Delhi 2010; HOTS

28. If $\begin{bmatrix} 1 & 2 \\ 3 & 1 \end{bmatrix} \begin{bmatrix} 7 \\ k \end{bmatrix} = \begin{bmatrix} 1 \\ 1 \end{bmatrix}$, then write the value of k.

Delhi 2010

29. If A is a matrix of order 3 × 4 and B is a matrix of order 4 × 3, then find order of matrix (AB).

Delhi 2010C

30. If $\begin{bmatrix} x+y & 1 \\ 2y & 5 \end{bmatrix} = \begin{bmatrix} 7 & 1 \\ 4 & 5 \end{bmatrix}$, then find the value of x.

Delhi 2010C

31. If $\begin{bmatrix} 2x+y & 0 \\ 3y & 4 \end{bmatrix} = \begin{bmatrix} 6 & 0 \\ 0 & 4 \end{bmatrix}$, then find the value of x.

All India 2010C

32. If $\begin{bmatrix} 3y-x \\ -2x \end{bmatrix} = \begin{bmatrix} 5 \\ 7 \end{bmatrix}$, then find the value of y.

All India 2010C

33. If $\begin{bmatrix} 2x & 1 \\ 5 & x+2y \end{bmatrix} = \begin{bmatrix} 4 & 1 \\ 5 & 0 \end{bmatrix}$, then find the value of y.

All India 2009C

34. If $\begin{bmatrix} y+2x & 5 \\ -x & 3 \end{bmatrix} = \begin{bmatrix} 7 & 5 \\ -2 & 3 \end{bmatrix}$, then find the value of y.

Foreign 2009

35. Find the value of x, if $\begin{bmatrix} 3x+y & -y \\ 2y-x & 3 \end{bmatrix} = \begin{bmatrix} 1 & 2 \\ -5 & 3 \end{bmatrix}$.

All India 2009

36. Find the value of y, if $\begin{bmatrix} x-y & 2 \\ x & 5 \end{bmatrix} = \begin{bmatrix} -1 & 2 \\ 3 & 5 \end{bmatrix}$

All India 2009

37. Find the value of x, if $\begin{bmatrix} 2x-y & 5 \\ 3y & -2 \end{bmatrix} = \begin{bmatrix} 6 & 5 \\ 3 & -2 \end{bmatrix}$.

All India 2009

38. If $\begin{bmatrix} 19 & x+y \\ 2 & y \end{bmatrix} = \begin{bmatrix} 15 & 8 \\ 3 & 3 \end{bmatrix}$, then find the value of x.

Delhi 2009C

$x - y$]

39. If A = [2 4 / 3 2] and B = [1 3 / −2 5], then find A – B.

All India 2009C

40. If [$x + 2y$ / $3y$] = [0 −3 / 8 2], then find x and y.

4

x 2

All India 2008C

41. Find x and y, if $2\begin{bmatrix}1 & 3\\ 0 & x\end{bmatrix} + \begin{bmatrix}y & 0\\ 1 & 2\end{bmatrix} = \begin{bmatrix} & 56\\ 1 & 8\end{bmatrix}$.

Delhi 2008; HOTS

Long Answer Types Questions

42. If $A = \begin{bmatrix}2 & 0 & 1\\ 2 & 1 & 3\\ 1 & -1 & 0\end{bmatrix}$; then find value of $A^2 - 3A + 2I$.

All India 2010

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

Delhi 2008

Short Answer Type Questions

1. Write 2 × 2 matrix which is both symmetric and skew-symmetric matrices.

Delhi 2014C

2. For what value of x, is the matrix $A = \begin{bmatrix}0 & 1 & -2\\ -1 & 0 & 3\\ x & -3 & 0\end{bmatrix}$ a skew –symmetric matrix?

All India 2013; HOTS

3. If $A^T = \begin{bmatrix}3 & 4\\ -1 & 2\\ 1 & 2\end{bmatrix}$ and $B = \begin{bmatrix}-1 & 2 & 1\\ 1 & 2 & 3\end{bmatrix}$, then find $A^T - B^T$.

All India 2012

4. If $A = \begin{bmatrix}1 & 2\\ 3 & 4\end{bmatrix}$, then find A + A'.

All India 2010C

5. If $A = \begin{bmatrix}3 & 4\\ 2 & 3\end{bmatrix}$, then find A + A', where A' is transpose of A.

All India 2009C

6. If matrix A = [1 2 3], then write AA'.

Delhi 2009; HOTS

Long Answer Type Questions

7. For the following matrices A and B, verify that [AB]' = B'A'; $A = \begin{bmatrix}1\\ -4\\ 3\end{bmatrix}$, B = [-1 2 1].

All India 2010

8. Express the following matrix as a sum of a symmetric and a skew-symmetric matrices and verify your result. $\begin{bmatrix} 3 & -2 & -4 \\ 3 & -2 & -5 \\ -1 & 1 & 2 \end{bmatrix}$

All India 2010; HOTs

ANSWERS

1. *10*

2. *x= 2*

3. *-I*

4. *3*

5. *0*

6. *0*

7. $x = \frac{7}{2}$

8. *4*

9. *6*

10. *a = 1*

11. $\begin{bmatrix} 8 & -3 & 5 \\ -2 & -3 & -6 \end{bmatrix}$

12. *k = 2*

13. *p = 4*

14. *6*

15. *I*

16. *7*

17. *x = 3*

18. $\begin{bmatrix} 3 & 1 \\ 1 & 2 \end{bmatrix}$

19. *1*

20. *3* x 3

21. *1* x 5, 5 x 1

22. $\frac{1}{2}$

23. *y = 2*

24. *x = 1*

25. *x = -1*

26. *x = 5*

27. 0^0

28. *k = 17*

29. *3* x 3

30. *x = 5*

31. *x = 3*

32. *y = 2*

33. *y = -1*

34. *y = 3*

35. *x = 1*

36. *y = 1*

37. *x = 2*

38. $\begin{matrix} 1 \\ 5 \end{matrix}$ *x = 5*

39. $\begin{bmatrix} 1 & 1 \\ -3 & \end{bmatrix}$

40. *x= 2,y= -1*

41. *x = 3, y = 3*

42. $\begin{bmatrix} 1 & -1 & -1 \\ 3 & -3 & -4 \\ -3 & 2 & 0 \end{bmatrix}$

ANSWERS

1. $\begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$

2. *x = 2*

3. $\begin{bmatrix} 4 & 3 \\ -3 & 0 \\ -1 & -2 \end{bmatrix}$

4. $\begin{bmatrix} 2 & 5 \\ & 5 \end{bmatrix}$

5. $\begin{bmatrix} 6 & 6 \\ & \\ 8 & 6 & 6 \end{bmatrix}$

6. [14]

8. $\frac{1}{2}\begin{bmatrix} 1 & -5 & 0 \\ 1 & -4 & -4 \\ -5 & -4 & 4 \end{bmatrix} + \frac{1}{2}\begin{bmatrix} 0 & -5 & -3 \\ 5 & 0 & -6 \\ 3 & 6 & 0 \end{bmatrix}$

Determinants

Short Answer Type Questions

1. If $\begin{vmatrix} 2 & 6 & -2 \\ x & 5 & 8 \\ 5 & 7 & x \end{vmatrix} = \begin{vmatrix} 6 & -2 \\ 7 & 3 \end{vmatrix}$, then write the value of x.

Delhi 2014

2. If $\begin{vmatrix} 3x & 7 \\ -2 & 4 \end{vmatrix} = \begin{vmatrix} 8 & 7 \\ 6 & 4 \end{vmatrix}$, then find the value of x.

All India 2014

3. If A is a 3 × 3 matrix, |A| ≠ 0 and |3A|= k|A|. Then write the value of K.

Foreign 2014

4. Find (adj A), if A = $\begin{bmatrix} 5 & 2 \\ 7 & 3 \end{bmatrix}$.

Delhi 2014C

5. Write the value of the determinant $\begin{vmatrix} p & p+1 \\ p-1 & p \end{vmatrix}$.

Delhi 2014C

6. If A is a square matrix of order 3 such that |adj (A)|= 64, then find |A|.

Delhi 2013C

7. If $\begin{vmatrix} 2x & x+3 \\ 2(x+1) & x+1 \end{vmatrix} = \begin{vmatrix} 1 & 5 \\ 3 & 3 \end{vmatrix}$, then find the value of x.

Delhi 2013C

8. If $\begin{vmatrix} x+1 & x-1 \\ x-3 & x+2 \end{vmatrix} = \begin{vmatrix} 4 & -1 \\ 1 & 3 \end{vmatrix}$, then write the value of x.

Delhi 2013

9. If A_{ij} is the cofactor of the element a_{ij} of the determinant $\begin{vmatrix} 2 & -3 & 5 \\ 6 & 0 & 4 \\ 1 & 5 & -7 \end{vmatrix}$, then write the value of $a_{32}.A_{32}$.

All India 2013; HOTS

10. Let A be a square matrix of order 3 × 3. Write the value of |2A|, where |A|=4.

All India 2012

11. If $\Delta = \begin{bmatrix} 5 & 3 & 8 \\ 2 & 0 & 1 \\ 1 & 2 & 3 \end{bmatrix}$, then write the minor of the of element a_{23}.

Delhi 2012

12. If the determinant of matrix A of order 3 × 3 is of value 4, then write the value of |3A|.

All India 2012C

13. For what value of x, $A = \begin{bmatrix} 2(x+1) & 2x \\ x & x-2 \end{bmatrix}$ is a singular matrix?

All India 2011C

14. For what value of x, the matrix $\begin{bmatrix} 2x+4 & 4 \\ x+5 & 3 \end{bmatrix}$ is a singular matrix?

All India 2011C

15. For what value of x, the matrix $\begin{bmatrix} 2x & 4 \\ x+2 & 3 \end{bmatrix}$ is a singular matrix?

Delhi 2011C

16. For what value of x, matrix $\begin{bmatrix} 6-x & 4 \\ 3-x & 1 \end{bmatrix}$ is a singular matrix?

Delhi 2011C

17. For what value of x, the matrix $\begin{bmatrix} 5-x & x+1 \\ 2 & 4 \end{bmatrix}$ is a singular?

Delhi 2011

18. Evaluate $\begin{vmatrix} \cos 15^o & \sin 15^o \\ \sin 75^o & \cos 75^o \end{vmatrix}$

All India 2011; HOTS

19. If $\begin{vmatrix} x & x \\ 1 & x \end{vmatrix} = \begin{vmatrix} 3 & 4 \\ 1 & 2 \end{vmatrix}$, then write the positive value of x.

Foreign 2011; All India 2008C

20. What is the value of determinant $\begin{vmatrix} 0 & 2 & 0 \\ 2 & 3 & 4 \\ 4 & 5 & 6 \end{vmatrix}$?

Delhi 2010

21. Find the minor of the element of second row and third column in the determinant

$$\begin{vmatrix} 5 & \cdot & \cdot \\ 4 & \cdot & \cdot \\ \cdot & \cdot & \cdot \end{vmatrix}$$

Delhi 2010

22. If $A = \begin{bmatrix} 3 & 1 \\ 2 & -3 \end{bmatrix}$, then find |adj A|.

Delhi 2011C: HOTS

23. If |A|=2, where A is a 2 × 2 matrix, then find |adj A|.

All India 2010C

24. What positive value of x makes following pair of determinants equal?

$$\begin{vmatrix} 2x & 3 \\ 5 & x \end{vmatrix} = \begin{vmatrix} 16 & 3 \\ 5 & 2 \end{vmatrix}$$

All India 20110

25. If A is a non-singular matrix of order 3 and $|\text{adj } A| = |A|^k$, then what is the value of K?

All India 2009C; HOTS

26. Evaluate $2\begin{vmatrix} 7 & -2 \\ -10 & 5 \end{vmatrix}$

Delhi 2009C

27. Find x from equation $\begin{vmatrix} x & 4 \\ 2 & 2x \end{vmatrix} = 0$.

All India 2009

28. If $A = \begin{bmatrix} 1 & 2 \\ 4 & 2 \end{bmatrix}$, then find the value of k, if $|2A| = k.|A|$.

Foreign 2009

29. Evaluate $\begin{vmatrix} 2\cos\theta & -2\sin\theta \\ \sin\theta & \cos \end{vmatrix}$.

Delhi 2008C

30. Evaluate $\begin{vmatrix} a+ib & c+id \\ -c+id & a-ib \end{vmatrix}$

Delhi 2008; HOTS

31. For what value of x, is the following matrix singular? $\begin{vmatrix} 3-2x & x+1 \\ 2 & 4 \end{vmatrix}$

Delhi 2008

32. If $\begin{vmatrix} 2x+ & \\ 5 & 3 \\ 5x+ & \\ 2 & 9 \end{vmatrix} = 0$, then find the value of x

Foreign 2008

Long Answer Type Questions

1. Two schools P and Q want to award their selected students on the values of discipline, politeness and punctuality. The school P wants to award Rs. *x* each, Rs. *y* each Rs. *z* each for the three respective values to 3, 2 and 1 students respectively with a total award money of Rs. 1000. School Q wants to spend Rs. 1500 to award its 4, 1 and 3 students on the respective values (by giving the same award money to the three values as before). If the total amount of award for one prize on each value is Rs. 600, using matrices, find the award money for each value. Apart from the above three values, suggest one more value for awards.

Value Based Question; Delhi 2014

2. Two schools A and B want to award their selected students on the values of sincerity, truthfulness and helpfulness. The school A wants to award Rs. *x* each, Rs. *y* each and Rs. *z* each for the three respective values of 3, 2 and 1 students, respectively with a total award money of Rs. 1600. School B wants to spend Rs. 2300 to award its 4, 1 and 3 students on the respective values (by giving the same award money to the three values as before). If the total amount of award for one prize on each value is Rs. 900, using matrices, find the award money for each value. Apart for these three values, suggest one more value which should be considered for award. **All India 2014; Value Based Question**

3. Two schools P and Q want to award their selected students on the values of tolerance, kindness and leadership. The school P wants to award Rs. *x* each, Rs. *y* each and Rs. *z* each for the three respective values to 3, 2 and 1 students respectively with a total award money of Rs. 2200.

School Q wants to spend Rs. 3100 to award its 4, 1 and 3 students on the respective values (by giving the same award money to the three values as school P). If the total amount of award for one prize on each value is Rs. 1200, using matrices, find the award money for each value. Apart from these three values, suggest one more value which should be considered for the award. **Foreign 2014; Value Based Question**

4. A total amount of Rs. 7000 is deposited in three different saving bank accounts with annual interest rates of 5%, 8% and $8\frac{1}{2}$% respectively. The total annual interest from these three accounts is Rs. 550. Equal amounts have been deposited in the 5% and 8% savings accounts. Find the amount deposited in each of the three accounts, with the help of matrices.
Delhi 2014C

5. Two schools, P and Q want to award their selected students for the values of sincerity, truthfulness and hard work at the rate of Rs. *x*, Rs. *y* and Rs. *z* for each respective value per student. School P awards its 2, 3 and 4 students on the above respective values with a total prize money of Rs. 4600. School Q wants to award its 3, 2 and 3 students on the respective values with a total award money of Rs. 4100. If the total amount of award money for one prize on each value is Rs. 1500, using matrices, find the award money for each value. Suggest one other value which the school can consider for awarding the students.

All India 2014C; Value Based Question

6. Two institutions decided to award their employees for the three values of resourcefulness, competence and determination in the form of prizes at the rate of Rs. *x*, Rs. *y* and Rs. *z* respectively per person. The first institution decided to award respectively 4, 3 and 2 employees with a total prize money of Rs. 37000 and the second institution decided to award respectively 5, 3 and 4 employees with a total prize money of Rs. 47000. If all three prizes per person together amount to Rs. 12000, then using matrix method, find the values of *x*, *y* and *z*. What values are described in this question? **Delhi 2014C; Value Based Question**

7. A school wants to award its students for the values of honesty, regularity and hard work with a total cash award of Rs. 6000. Three times the award money for hard work added to that given for honesty, amounts to Rs. 11000. The award money given for honesty and hard work together is double the one given for regularity. Represent the above situation algebraically and find the award money for each value, using matrix method. Apart from these values, namely, honesty, regularity and hard work, suggest one more value which the school must include for award.

Value Based Question; Delhi 2013

8. The management committee of a residential colony decided to award some of its members (say x) for honesty, some (say y) for helping others and some others (say z) for supervising the workers to keep the colony neat and clean. The sum of all the awardees is 12. Three times the

sum of awardees for cooperation and supervision added to two times the number of awardees for honesty is 33. If the sum of the number of awardees for honesty and supervision is twice the number of awardees for helping others, using matrix method, find the number of awardees of each category. Apart from these values, namely, honesty, cooperation and supervision, suggest one more value which the management of the colony must include for awards.

Value Based Question; All India 2013

9. Using matrices, solve the following system of equations.

$x - y + 2z = 7$ $3x + 4y - 5z = -5$ and $2x - y + 3z = 12$

Delhi 2012

10. Using matrices, solve the following system of linear equations.

$x + y - z = 3$ $2x + 3y + z = 10$ and $3x - y - 7z = 1$

All India 2012

11. If $A = \begin{bmatrix} 1 & 2 & 1 \\ -1 & 1 & 1 \\ 1 & -3 & 1 \end{bmatrix}'$ then find A^{-1} and hence solve the system of equations

$x + 2y + z = 4$ $-x + y + z = 0$ and $x - 3y + z = 4$.

Delhi 2012C

12. Determine the product of $\begin{bmatrix} -4 & 4 & 4 \\ -7 & 1 & 3 \\ 5 & -3 & -1 \end{bmatrix} \begin{bmatrix} 1 & -1 & 1 \\ 1 & -2 & -2 \\ 2 & 1 & 3 \end{bmatrix}$ and then use to solve the system of equations

$x - y + z = 4$ $x - 2y - 2z = 9$ and $2x + y + 3z = 1$

Delhi 2012C; HOTS

13. Find A^{-1}, where $A = \begin{bmatrix} 1 & 2 & -3 \\ 2 & 3 & 2 \\ 3 & -3 & -4 \end{bmatrix}$. Hence, solve the system of equations,

$x + 2y - 3z = -4$ $2x + 3y + 2z = 2$ and $3x - 3y - 4z = 11$.

All India 2012C, 2010, 2008

14. Using matrix method, solve the following system of equations.

$\frac{2}{x} + \frac{3}{y} + \frac{10}{z} = 4$ $\frac{4}{x} - \frac{6}{y} + \frac{5}{z} = 1$ and $\frac{6}{x} + \frac{9}{y} - \frac{20}{z} = 2, \; x, y, z \neq 0$

Delhi 2011

15. Using matrices, solve the following system of equations. $4x + 3y + 2z = 60$ $x + 2y + 3z = 45$ and $6x + 2y + 3z = 70$

All India 2011

16. Using matrices, solve the following system of equations.

$x + 2y + z = 7$ $x + 3z = 11$ and $2x - 3y = 1$

All India 2011; Delhi 2008C

17. Using matrices, solve the following system of equations.

$x + 2y - 3z = -4$ $2x + 3y + 2z = 2$ and $3x - 3y - 4z = 11$

All India 2011, 2008

18. Use product $\begin{bmatrix} 1 & -1 & 2 \\ 0 & 2 & -3 \\ 3 & -2 & 4 \end{bmatrix} \begin{bmatrix} -2 & 0 & 1 \\ 9 & 2 & -3 \\ 6 & 1 & -2 \end{bmatrix}$ to solve the system of equations

$x - y + 2z = 1$ $2y - 3z = 1$ and $3x - 2y + 4z = 2$

HOTS; Foreign 2011

19. If $A = \begin{bmatrix} 2 & -1 & 1 \\ 3 & 0 & -1 \\ 2 & 6 & 0 \end{bmatrix}$, then find A^{-1}.

Using A^{-1}, solve the following system of equations

$2x - y + z = -3$ $3x - z = 0$ and $2x + 6y - z = 2$

All India 2011C

20. If $A = \begin{bmatrix} 1 & -2 & 1 \\ 0 & -1 & 1 \\ 2 & 0 & -3 \end{bmatrix}$, then find A^{-1} and hence solve the following system of equations

$x - 2y + z = 0$ $- y + z = -2$ and $2x - 3z = 10$

All India 2011C

21. If $A = \begin{bmatrix} 1 & -2 & 0 \\ 2 & 1 & 3 \\ 0 & -2 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} -2 & 7 & 2 & -6 \\ -2 & 1 & -3 \\ -4 & 2 & 5 \end{bmatrix}'$ then find AB and hence solve system of equations

$x - 2y = 10$ $2x + y + 3z = 8$ $-2y + z = 7$

Delhi 2011C

22. If $A = \begin{bmatrix} 3 & -4 & 2 \\ 2 & 3 & 5 \\ 1 & 0 & 1 \end{bmatrix}$, then find A^{-1} and hence solve the following system of equations

$3x - 4y + 2z = -1$ $2x + 3y + 5z = 7$ and $x + z = 2$

Delhi 2011C

23. If $A = \begin{bmatrix} 8 & -4 & 1 \\ 10 & 0 & 6 \\ 8 & 1 & 6 \end{bmatrix}$, then find A^{-1} and hence solve the following system of equations

$8x - 4y + z = 5$ $10x + 6z = 4$ and $8x + y + 6z = \frac{5}{2}$

All India 2010C

24. If $A = \begin{bmatrix} 1 & -1 & 0 \\ 2 & 3 & 4 \\ 0 & 1 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & -4 \\ 2 & -4 \\ -1 & 5 \end{bmatrix}$, then find AB. Use this to solve the system of equations

$x - y = 3$ $2x + 3y + 4z = 17$ and $y + 2z = 7$

All India 2010C

25. If $A = \begin{bmatrix} 3 & 2 & 1 \\ 4 & -1 & 2 \\ 7 & 3 & -3 \end{bmatrix}$, then find A^{-1}. Hence, solve the following system of equations

$3x + 2y + z = 6$ *$4x - y + 2z = 5$* *and* *$7x + 3y - 3z = 7$*

Delhi 2010C

26. Using matrices, solve system of linear equations

$x + y + z = 6$ $x + 2z = 7$ and $3x + y + z = 12$

All India 2009

27. Solve the following system of equations, by using matrix method.

$3x - 2y + 3z = 8$ $2x + y - z = 1$ and $4x - 3y + 2z = 4$

Foreign 2009

28. Using matrices, solve the following system of equations

$x + y + z = 1$ $x - 2y + 3z = 2$ and $x - 3y + 5z = 3$

All India 2009C

29. Using matrices, solve the following system of equations

$8x + 4y + 3z = 18$ $2x + y + z = 5$ and $x + 2y + z = 5$

All India 2009C

30. Using matrices, solve the following system of equations

$x + y - z = 3$ $2x + 3y + z = 10$ and $3x - y - 7z = 1$

Delhi 2009C

31. Using matrices, solve the following system of equations

$2x + 8y + 5z = 5$ $x + y + z = -2$ and $x + 2y - z = 2$

Delhi 2009C

32. Using matrices, solve the following system of equations

$x - y + 2z = 1$ $2y - 3z = 1$ and $3x - 2y + 4z = 2$

All India 2008C

33. Using matrices, solve the following system of equations

$2x + y + z = 7$ $x - y - z = -4$ and $3x + 2y + z = 10$

All India 2008C

ANSWERS

Short Answer Type Questions

1. $x = \pm 6$	**2.** $x = -2$	**3.** $k = 27$	**4.** 1	**5.** 1
6. ± 8	**7.** $x = 1$	**8.** $x = 2$	**9.** 110	**10.** 32
11. 7	**12.** 108	**13.** $x = -2$	**14.** $x = 4$	**15.** $x = 4$
16. $x = 2$	**17.** $x = 3$	**18.** 0	**19.** 2	**20.** 8
21. 13	**22.** -11	**23.** 2	**24.** 4	**25.** $k = 2$
26. 30	**27.** $x = \pm 2$	**28.** $k = 4$	**29.** 2	**30.** $a^2 + b^2 + c^2 + d^2$
31. $x = 1$	**32.** $x = -13$			

Long Answer Type Questions

1. *x = 100, y = 200, z = 300*

2. *x = 200, y = 300, z = 400*

3. *x = 300, y = 400, z = 500*

4. *Rs.1125, Rs. 1125, Rs. 4750*

5. *x = 500, y = 400, z = 600*

6. 4000, *5000, 3000*

7. *Rs. 500, 2000, 3500*

8. *x = 3, y = 4, z = 5*

9. *x = 2, y = 1, z = 3*

10. *x = 3, y = 1, z = 1*

11. $\frac{1}{10}\begin{bmatrix} 4 & -5 & 1 \\ 2 & 0 & -2 \\ 2 & 5 & 3 \end{bmatrix}$ *and* *x = 2, y = 0, z = 2*

12. *product = 8I*
x = 3, y = -2, z = -1

13. $\frac{1}{67}\begin{bmatrix} -6 & 17 & 13 \\ 14 & 5 & -8 \\ -15 & 9 & -1 \end{bmatrix}$ *and* *x = 3, y = -2, z = 1*

14. *x = 2, y = 3, z = 5*

15. *x = 5, y = 8, z = 8*

16. *x = 2, y = 1, z = 3*
x = 0, y = 5, z = 3

17. *x = 3, y = -2, z = 1*

18. *product = I*

19. $\frac{1}{3^2}\begin{bmatrix} 6 & 6 & 1 \\ -2 & -2 & 5 \\ 18 & -14 & 3 \end{bmatrix}$

20. $\begin{bmatrix} 3 & -6 & -1 \\ 2 & -5 & -1 \\ 2 & -4 & -1 \end{bmatrix}$
x = 2, y = 0, z = -2

21. *AB = 11I*
x = 4, y = -3, z = 1

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

22. $\frac{-1}{9}\begin{bmatrix} 3 & 4 & -26 \\ 3 & 1 & -11 \\ -3 & -4 & 17 \end{bmatrix}$

23. $\frac{1}{10}\begin{bmatrix} -6 & 25 \\ -24 & -38 \\ -12 & 40 \end{bmatrix}$

24. $AB = 6I$

$x = 2, y = -1 \quad z = 4$

$x = 3, y = 2, z = -1$

$x = 1, y = 1/2, z = -1$

25. $\frac{1}{62}\begin{bmatrix} -3 & 9 & 5 \\ 26 & -16 & -2 \\ 5 & 5 & -11 \end{bmatrix}$

26. $x = 3, y = 1, z = 2$

27. $x = 1, y = 2, z = 3$

and $x = 1, y = 1, z = 1$

28. $x = 1, y = 0, z = -\frac{1}{2}$

29. $x = 1, y = 1, z = 2$

30. $x = 3, y = 1, z = 1$

31. $x = -3, y = 2, z = -1$

32. $x = 0, y = 5, z = 3$

33. $x = 1, y = 2, z = 3$

Physics (042)

Art Integration Project(1.1.1)
Solar energy used to generate electricity in Arunachal Pradesh.

Investigatory Project
1. Aiswarya - To study various factors on which the internal resistance/EMF of a cell depends.
2. Anjali - To study the variations in current flowing in a circuit containing an LDR because of a variation in (a) the power of the incandescent lamp, used to 'illuminate' the LDR (keeping all the lamps at a fixed distance). (b) the distance of an incandescent lamp (of fixed power) used to 'illuminate' the LDR.
3.Arshika - To find the refractive indices of (a) water (b) oil (transparent) using a plane mirror, an equiconvex lens (made from a glass of known refractive index) and an adjustable object needle.
4. Muskan - To investigate the relation between the ratio of (i) output and input voltage and (ii) number of turns in the secondary coil and primary coil of a self-designed transformer.
5. Nitesh - To investigate the dependence of the angle of deviation on the angle of incidence using a hollow prism filled one by one, with different transparent fluids.
6.Siddarth - To estimate the charge induced on each one of the two identical Styrofoam (or pith) balls suspended in a vertical plane by making use of Coulomb's law.
7. Utkarsh - To study the factor on which the self-inductance of a coil depends by observing the effect of this coil, when put in series with a resistor/(bulb) in a circuit fed up by an A.C. source of adjustable frequency.
8.Himanshu - To study the earth's magnetic field using a compass needle -bar magnet by plotting magnetic field lines and tangent galvanometer
9.Pooja - To study various factors on which the internal resistance/EMF of a cell depends.
10. Prince - To study the variations in current flowing in a circuit containing an LDR because of a variation in (a) the power of the incandescent lamp, used to 'illuminate' the LDR (keeping all the lamps at a fixed distance). (b) the distance of an incandescent lamp (of fixed power) used to 'illuminate' the LDR.
11.Azeem - To find the refractive indices of (a) water (b) oil (transparent) using a plane mirror, an equiconvex lens (made from a glass of known refractive index) and an adjustable object needle.
12.Sheejal - To investigate the dependence of the angle of deviation on the angle of incidence using a hollow prism filled one by one, with different transparent fluids.
13. Riya Sharma - - To investigate the relation between the ratio of (i) output and input voltage and (ii) number of turns in the secondary coil and primary coil of a self-designed transformer.

The project file must contain
Front page
Acknowledgement
Certificate
Aim
Index
Requirements
Theory
Procedure
Observation Table
Result
Bibliography
Thank You page with Science Quote

Working Model
1. Charging and Discharging of capacitor working model
2. Electromagnetic Induction Working Model

3. DC Motor Working Model
4. Eddy Current Working Model

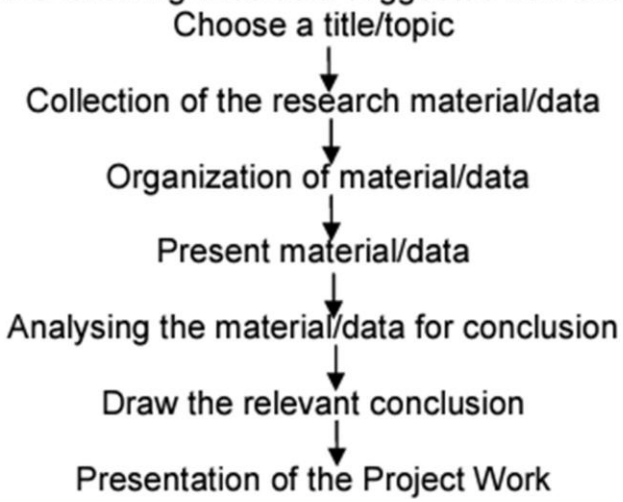
Note: These are for reference only you can choose anyone or any other working model according to your convenience. Everyone has to prepare one working model individually.

ECONOMICS (030) PROJECT WORK

As per the suggestive list of topics given in the CBSE curriculum, each student has to complete the Economics Project file on any one of the chosen topics.

Scope of the project:

Learners may work upon the following lines as a suggested flow chart:



Marking Scheme :

Marks are suggested to be given as –

S. No.	Heading	Marks Allotted
1.	Relevance of the topic	3
2.	Knowledge Content/Research Work	6
3.	Presentation Technique	3
4.	Viva-voce	8
	Total	20 Marks

Answer the following questions as per weightage provided in Economics register:

Q1. Giving reasons, classify the following into intermediate and final products: 2

i) Furniture purchased by a school.

ii) Chalks and dusters purchased by a school.

Q2. Distinguish between real and nominal gross domestic product. 3

Q3. Explain how externalities are a limitation in taking Gross Domestic Product as an index of welfare.
3

Q4. India can add value to its growth by resorting to a circular economy emphasizing maximum utility of products, components and materials, a study by a United Nations body said. - The Economic Times, 5 December, 2016

In light of the above statement, what is the significance of the circular flow of

income? 3 Q5. The Government of India has recently launched ' Jan - Dhan

Yojana' aimed at every
household in the country to have at least one bank account. Explain how deposits made under the plan are going to affect the national income of the country.
3

Q6. Explain the components of Legal Reserve Ratio.
3

Q7. Distinguish between Repo Rate and Reverse Repo Rate.
3

Q8. Critically evaluate Industrial and Trade policies implemented in India between 1950 - 1990.
3

Q9. Give the advantages of privatization and disinvestment in India.
3

Q10. How is India performing in agriculture after the implementation of NEP 1991?
3

Worksheet - 1

SET-1

Fill in the Blanks
Choose appropriate word/term and fill in the blank:
1. ____ studies problems of scarcity and choice at the level of an economy as a whole.
2. ____ equilibrium is the method of study in microeconomics.
3. Theory of employment is studied under ____ economics.
4. Allocation of resources is the central issue in ____.
5. In macroeconomics, micro variables ____ assumed to be constant.
6. ____ is an example of institutional economic agent in India.

SET-2

Multiple Choice
Choose the correct option:

1. Study of macroeconomics is concerned with:
(a) theory of demand (b) determination of aggregate output
(c) general price level (d) both (b) and (c)

2. Which of the following is an example of macroeconomics?
(a) Saving of an individual (b) Consumption of a household
(c) Price level of a firm (d) Aggregate demand of an economy
3. Which of the following is not a macro variable?
(a) Wholesale price index (b) Output of the firm
(c) Aggregate demand (d) Aggregate supply
4. Partial equilibrium relates to:
(a) microeconomics (b) macroeconomics
(c) both (a) and (b) (d) none of these
5. Study of price level is a subject matter of:
(a) microeconomics (b) macroeconomics
(c) both (a) and (b) (d) none of these
6. Which of the following is the main feature of macroeconomics?
(a) Study of an individual (b) Sub-normal equilibrium
(c) Partial equilibrium (d) None of these
7. Which of the following is correct?
(a) Microeconomics studies equilibrium of an industry
(b) There is a smaller degree of aggregation in microeconomics
(c) Fiscal policy of the government is a part of microeconomic analysis
(d) Both (a) and (b)
8. In the context of macroeconomics, which one of the following statements is correct?
(a) Partial equilibrium is the method of study in macroeconomics
(b) There is no aggregation in macroeconomics
(c) Determination of overall level of output is the central issue in macroeconomics
(d) All of these
9. Which of the following is a macroeconomic variable?
(a) National income
(b) Consumption expenditure in the economy
(c) Investment expenditure in the economy
(d) All of these
10. Which of the following statements is associated with partial equilibrium analysis?
(a) Equilibrium in the market of silver ornaments
(b) Equilibrium across all markets in the economy
(c) Equilibrium price of the goods across all markets in the economy
(d) None of these

SET-3: True or False

State whether the following statements are True or False:
1. Microeconomics is concerned with the economy as a whole.
2. Individual economic agents include consumers and producers.
3. In macroeconomics, there is a limited degree of aggregation.
4. What is true of microeconomics is also true of macroeconomics.
5. Microeconomic agents focus on the maximisation of personal gains.
6. Method of study in macroeconomics is often described as general equilibrium analysis.

SET-4: True-False Alternatives

In the following questions (1–5), two statements are given. Read the statements carefully and choose the correct alternative among those given below:

Alternatives:

(a) Both the statements are true

(b) Both the statements are false

(c) Statement 1 is true and Statement 2 is false

(d) Statement 2 is true and Statement 1 is false

Statement 1: Determination of national income is the central issue in microeconomics.

Statement 2: Economic decisions are not taken by the institutional economic agents at micro level.

Statement 1: Institutional agents include consumers and producers.

Statement 2: Individual economic agents focus on the maximisation of social welfare.

Statement 1: Macroeconomics studies such economics issues that concern the welfare of all residents of a country.

Statement 2: Macroeconomics studies how government can improve the state of economy of a country.

Statement 1: Theory of money comes under the scope of microeconomics.

Statement 2: Study of depression is a subject matter of macroeconomics.

Statement 1: Credit creation is an important function of the central bank.

Statement 2: Commercial banks regulate the supply of money in the economy.

SET-5

Choose the Correct Pair of Statements/Identify the Correct Sequence of Alternatives

1. From the set of statements given in Column I and Column II, choose the correct pair of statements.

Column I

A. Allocation of resources

B. Problem of inflation in India

C. Solving a future economic problem

D. Research on reduction of social gains from the viewpoint of the economy

Column II

(i) Macroeconomics studies issues that concern the satisfaction of social welfare.

(ii) Theory of money comes under the scope of microeconomics.

(iii) Credit creation is a subject matter of microeconomics.

(iv) Commercial banks regulate the supply of money in the economy.

Alternatives:

(a) A – (i) (b) B – (ii)

(c) C – (iii) (d) D – (iv)

2. Identify the correct sequence of alternatives given in Column II by matching them with respective items in Column I.

Column I

A. Macroeconomics
B. General equilibrium analysis
C. Equilibrium of an industry
D. A macroeconomic agent

Column II

(i) Related to all the firms producing a particular good
(ii) Studies problems at an individual level
(iii) Related to economy as a whole
(iv) Method of study in macroeconomics

Alternatives:

(a) A – (iii), B – (iv), C – (i), D – (ii)
(b) A – (ii), B – (iii), C – (i), D – (iv)
(c) A – (iii), B – (ii), C – (iv), D – (i)
(d) A – (i), B – (iv), C – (ii), D – (iii)

3. Identify the correct sequence of alternatives given in Column II by matching them with respective items in Column I:

Column I

A. Macroeconomics
B. General equilibrium
C. Aggregate demand
D. Investment expenditure

Column II

(i) Capital formation
(ii) Demand for all the goods and services in the economy
(iii) Simultaneous equilibrium across all markets in the economy
(iv) Studies equilibrium level of GDP

Alternatives:

(a) A – (iii), B – (ii), C – (iv), D – (i)
(b) A – (iv), B – (iii), C – (ii), D – (i)
(c) A – (iii), B – (iv), C – (i), D – (ii)
(d) A – (ii), B – (iv), C – (i), D – (iii)

SET-6: Assertion and Reasoning

In the following questions (1–5), a statement of Assertion (A) is followed by a statement of Reason (R).

Choose the correct alternative among those given below:

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A)

(b) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A)
(c) Assertion (A) is true but Reason (R) is false
(d) Assertion (A) is false but Reason (R) is true

1. Assertion (A): Microeconomics is an aggregation of all the firms producing a particular commodity in the market.
Reason (R): Macroeconomics is an aggregation of all economic units in the economy.
2. Assertion (A): From the viewpoint of an individual, saving is a vice.
Reason (R): 'Save more' is not always a virtue.
3. Assertion (A): Budgetary policy of the government is a part of macroeconomic analysis.
Reason (R): This policy is related to the issues of growth and development at the level of the economy as a whole.
4. Assertion (A): Economic agents refer to the individuals and institutions who take economic decisions.
Reason (R): National income is a microeconomic variable.
5. Assertion (A): General equilibrium relates to simultaneous equilibrium in all the markets in the economy.
Reason (R): Partial equilibrium relates to equilibrium in only one market.

Worksheet - 2

SET-1: Fill in the Blanks

1. ____ goods are purchased by one firm from the other for use as a raw material.
2. Consumption goods are also called ____ goods.
3. Change in inventory stock during the year is called ____ investment of producers.
4. Expenditure on Final Goods = Consumption Expenditure + ____
5. ____ includes replacement investment.
6. ____ is an example of stock variable.
7. ____ flow refers to the flow of money across different sectors of the economy.
8. Money flows are the reciprocal of ____.
9. A hundred rupee note is an example of ____.
10. ₹2,000 note lying in wallet of Rohini, a student is an example of ____ variable.

SET-2: Multiple Choice Questions

1. Intermediate goods are those goods
(a) which have not yet crossed the boundary line of production
(b) which are purchased by one firm from the other firm for resale
(c) which are not included in the estimation of national product
(d) all of these
2. Goods that are used by the producers for several years and are of high value are called:
(a) intermediate goods (b) final goods
(c) capital goods (d) both (b) and (c)

3. Electric goods like tubelights and bulbs are examples of:
(a) durable consumption goods (b) semi-durable consumption goods
(c) non-durable consumption goods (d) all of these
4. A car purchased by a household is a:
(a) single use capital good (b) single use consumer good
(c) durable consumer good (d) semi-durable consumer good
5. Expenditure of the producers on the purchase of capital goods causes:
(a) fixed investment (b) inventory investment
(c) gross investment (d) net investment
6. Depreciation is the:
(a) loss of value of fixed assets in use due to normal wear and tear
(b) loss of value of fixed assets in use due to normal rate of accidental damages
(c) loss of value of fixed assets in use due to foreseen obsolescence
(d) all of these
7. Which of the following is the cause of unexpected obsolescence?
(a) Natural calamities (b) Change in demand
(c) Change in technology (d) Both (b) and (c)
8. Loss of value of fixed assets owing to unexpected obsolescence is called:
(a) capital formation (b) capital loss
(c) unexpected loss (d) depreciation
9. Which of the following are the final users of consumer goods?
(a) Households (b) Non-profit private institutions
(c) Government (d) All of these
10. Quantity measured at a particular point of time is called:
(a) flow variable (b) stock variable
(c) fixed inventory (d) none of these
11. The non-stop continuity of intersectoral flows is called:
(a) circular flows (b) real flows
(c) money flows (d) none of these
12. Flow of goods and services across different sectors of the economy is called:
(a) real flow (b) circular flow
(c) monetary flow (d) inventory flow
13. The producer sector depends on the household sector for the supply of:
(a) goods and services (b) factors of production
(c) both (a) and (b) (d) none of these
14. Money flows are the reciprocal of:
(a) monetary flows (b) real flows
(c) circular flows (d) inventory flows
15. Which of the following is not a flow variable?
(a) Income (b) Capital formation
(c) Supply of money in a country (d) Leakage of water from the overhead tank

True or False

1. Purchase of machinery by a producer is an intermediate good.
2. Intermediate goods are included in the estimation of national income.

3. All producer goods are capital goods.
4. Services are tangible in nature.
5. Capital goods are used in the production process only once.
6. Gross Investment = Net Investment – Depreciation.
7. TV is an example of durable consumer good.
8. Households are the owners of the factors of production.
9. A stock variable has no time dimension.
10. Capital formation is a stock variable.

SET-4: True-False Alternatives

Instructions: In the following questions (1–5), two statements are given. Choose the correct alternative:

(a) Both the statements are true
(b) Both the statements are false
(c) Statement 1 is true and Statement 2 is false
(d) Statement 2 is true and Statement 1 is false
1. Statement 1: Expenditure on final goods includes consumption expenditure and investment expenditure.
Statement 2: Expenditure on intermediate goods leads to intermediate consumption.
2. Statement 1: Depreciation reserve fund helps to maintain the existing stock of capital.
Statement 2: Unexpected obsolescence occurs owing to change in demand in the market.
3. Statement 1: Fixed investment raises production capacity of the producers.
Statement 2: Inventory investment primarily consists of investment in terms of the stock of material only.
4. Statement 1: Capital goods lead to direct satisfaction of human wants.
Statement 2: Higher production of consumption goods leads to higher production capacity in the economy.
5. Statement 1: All capital goods are producer goods.
Statement 2: All producer goods are capital goods.

SET-5: Choose the Correct Pair of Statements

1. Instructions: From the set of statements given in Column I and Column II, choose the correct pairs:

Column I Column II

A. Value of intermediate goods (i) A part of the value of final goods
B. Capital goods (ii) Consumed by the households when purchased
C. Inventory investment (iii) Fixed investment
D. Net investment (iv) Gross investment + Depreciation
Alternatives:
(a) A – (i)
(b) B – (ii)

(c) C – (iii)
(d) D – (iv)

2. Identify the correct sequence of alternatives given in Column II by matching them with respect to the items in Column I:

Column I	Column II
A. Bread and butter	(*i*) Change in the stock of capital
B. Furniture	(*ii*) Considered for the estimation of depreciation
C. Capital formation	(*iii*) Final consumer goods
D. Expected obsolescence	(*iv*) A semi-durable consumption good

Alternatives:

(*a*) A—(*ii*), B—(*iii*), C—(*iv*), D—(*i*)
(*b*) A—(*iii*), B—(*iv*), C—(*i*), D—(*ii*)
(*c*) A—(*iv*), B—(*iii*), C—(*i*), D—(*ii*)
(*d*) A—(*ii*), B—(*iv*), C—(*i*), D—(*iii*)

SET-6

Assertion and Reasoning

In the following questions (1-5), a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct alternative among those given below:

Alternatives:

(*a*) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A)

(*b*) Both Assertion (A) and Reason (R) are true and Reason (R) is not the correct explanation of Assertion (A)

(*c*) Assertion (A) is true but Reason (R) is false

(*d*) Assertion (A) is false but Reason (R) is true

1. Assertion (A) : Domestic income is less than national income when net factor income from abroad is positive.
   Reason (R) : National income is an earned income.
2. Assertion (A) : A foreigner working in Indian embassy in Japan is a normal resident of India.
   Reason (R) : An Indian working in Asian Development Bank in Russia is a normal resident of India.
3. Assertion (A) : Real GDP is a better index of economic growth than the nominal GDP.
   Reason (R) : The index of real GDP always reflects a change in the level of output.
4. Assertion (A) : Net indirect tax is the basis of difference between market price and factor cost.
   Reason (R) : By adding net exports to domestic income, we estimate national income.
5. Assertion (A) : Constant year prices are the prices prevailing during the year of estimation.
   Reason (R) : Nominal GDP is the GDP estimated at current year prices.

WORKSHEET-3

SET-1

Fill in the Blanks

Choose appropriate word/ term and fill in the blank:

By adding _____ to domestic income, we estimate national income.

_____ income is an unearned income.

GDP at Market Price = NDP at Market Price + _____

_____ lower the market price of the goods.

_____ includes factor incomes only.

Real GDP refers to GDP at _____ prices.

Current year prices are the prices prevailing during the _____

_____ is an appropriate index of economic growth.

When Nominal Gross Domestic Product (GDP) is ₹840 crore and price index is 120, the Real Gross Domestic Product (GDP) will be _____

_____ the growth of GDP, greater is the flow of goods and services.

SET-2

Multiple Choice

Choose the correct option.

Economic territory of a country in which economic activities of the country generate domestic income is called

(*a*) national territory
(*b*) domestic territory
(*c*) political territory
(*d*) geographical territory

Domestic income:

(*a*) is the sum total of factor incomes generated within the domestic territory of a country
(*b*) is generated by the normal residents as well as non-residents within the domestic territory of a nation
(*c*) is equal to national income when net factor income from abroad is zero
(*d*) all of these

Factor payment received by the households for rendering their services as employees to producing units is called _____

(*a*) compensation of employees
(*b*) rent
(*c*) interest
(*d*) profit

Net Indirect Taxes =

(*a*) Indirect taxes + Subsidies
(*b*) Direct taxes + Subsidies
(*c*) Indirect taxes – Subsidies
(*d*) Direct taxes – Subsidies

5. **Which of the following statement is incorrect?** [CBSE 2020 (58/5/2)]

(a) Gross Domestic Product (GDP) at market price = GDP at factor cost + Net indirect taxes

(b) Net National Product (NNP) at market price = NNP at factor cost

(c) Gross National Product (GNP) at market price = GDP at market price plus Net factor income from abroad

(d) Net National Product (NNP) at factor cost = National Income

6. **Net Factor Income from Abroad =**

(a) National income – Net indirect taxes (b) National income – Indirect taxes

(c) National income – Domestic income (d) Domestic income – National income

7. **Factor incomes are:**

(a) earned incomes (b) unearned incomes

(c) both earned as well as unearned incomes (d) neither earned nor unearned incomes

8. **Which of the following is not a transfer payment?**

(a) Gifts from abroad (b) Retirement pensions

(c) Donations (d) Grants

9. **Nominal GDP refers to _____.**

(a) GDP at constant prices (b) GDP at base year prices

(c) GDP at current prices (d) none of these

10. **Real GDP is considered as an index of _____.**

(a) price level in the economy (b) welfare of the people

(c) profit maximisation (d) none of these

11. **Which of the following makes GDP an inappropriate index of welfare?**

(a) Non-monetary transactions (b) Externalities

(c) Composition and distribution of GDP (d) All of these

12. **Smoke emitted by a chemical factory and causing air pollution is an example of _____.**

(a) positive externalities (b) negative externalities

(c) either of the two (d) neither of the two

13. **Which of the following is an example of normal residents of India?**

(a) Foreign worker working in WHO located in India

(b) The German working as Director in IMF office located in India

(c) Ambassador in India from rest of the world

(d) Ambassador of India in rest of the world

14. **Which of the following leads to market price?**

(a) Factor cost – Indirect taxes (b) Factor cost – Net indirect taxes

(c) Factor cost + Indirect taxes (d) Factor cost + Net indirect taxes

15. **Which of the following is correct?**

(a) GDP_{FC} = Compensation of employees + Rent + Interest + Profit

(b) GDP_{FC} = Compensation of employees + Rent + Interest + Profit + Depreciation

(c) GDP_{FC} = Compensation of employees + Rent + Interest + Profit – Depreciation

(d) GDP_{FC} = NDP_{FC} – Depreciation

16. **Find domestic income when GNP_{MP} = ₹ 1,20,000, indirect taxes = ₹ 20,000, consumption of fixed capital = ₹ 5,000, net exports = ₹ 5,000 and factor income from rest of the world = ₹ 3,000.**

(a) ₹ 92,000 (b) ₹ 98,000

(c) ₹ 1,03,000 (d) ₹ 1,28,000

17. **If NDP_{FC} = ₹ 4,300, depreciation = ₹ 1,350, subsidies = ₹ 250, net factor income fr abroad = ₹ 330, GDP_{MP} will be:**
(a) ₹ 2,370
(b) ₹ 2,700
(c) ₹ 5,400
(d) ₹ 6,230

18. **When NNP_{MP} = ₹ 5,330, indirect taxes = ₹ 1,770 and consumption of fixed capital ₹ 1,550, then: GNP_{FC} =**
(a) ₹ 2,010
(b) ₹ 3,560
(c) ₹ 5,110
(d) ₹ 8,650

19. **If in an economy the value of net factor income from abroad is ₹ 200 crore and the value factor income to abroad is ₹ 40 crore, the value of factor income from abroad is:**
(a) ₹ 200 crore
(b) ₹ 160 crore
(c) ₹ 240 crore
(d) ₹ 180 crore

20. **When nominal GDP is 840 and price index is 120, real GDP will be:**
(a) 7
(b) 700
(c) 720
(d) 960

SET-3

True or False

State whether the following statements are True or False:

1. GDP at Factor Cost = NDP at Factor Cost – Depreciation.
2. National income is the sum total of factor incomes.
3. Ambassador from India in Japan is a non-resident of India.
4. GNP at Market Price = GDP at Market Price + Net Factor Income from Abroad.
5. Domestic income includes net factor income from abroad.
6. Monetary GDP is estimated using the base year prices.
7. Real GDP is a good measure of welfare of people.
8. Nominal GDP = Real GDP $\times \frac{\text{Price Index}}{100}$.
9. Environmental pollution causes a loss of social welfare.
10. Externalities are only the good impact of an activity without paying the price for that.

SET-4

True-False Alternatives

In the following questions (1-5), two statements are given. Read the statements carefully and choose the correct alternative among those given below:

Alternatives:

(a) Both the statements are true
(b) Both the statements are false
(c) Statement 1 is true and Statement 2 is false
(d) Statement 2 is true and Statement 1 is false

1. Statement 1 : Foreigner working in International labour organisation located in India is normal resident of India.
Statement 2 : Increase in national income does not always imply increase in domestic income as well.

GNP at market price is the sum total of gross domestic product at market price and net indirect taxes.

GNP at factor cost is the sum total of net domestic product at factor cost and net factor income from abroad.

Transfer incomes are not included in the estimation of national income.

Factor incomes are not earned as rewards for rendering factor services.

National income does not include net factor income from abroad.

Domestic income is generated within the domestic territory of a country.

Real GDP increases only when there is increase in the quantum of output in the economy.

Real GDP is estimated by using the base year prices.

-5

Statements/Identify the Correct Sequence of Alternatives

From the set of statements given in Column I and Column II, choose the correct pair of statements:

Column I	Column II
A. National income	(*i*) Includes factor incomes as well as transfer incomes
B. Domestic income	(*ii*) Sum total of factor incomes generated within the domestic territory of a country
C. GDP_{MP}	(*iii*) NDP_{MP} – Depreciation
D. NDP_{FC}	(*iv*) Compensation of employees + Rent + Interest + Profit + Net factor income from abroad

Alternatives:

(a) A—(*i*) (*b*) B—(*ii*)

(c) C—(*iii*) (*d*) D—(*iv*)

Identify the correct sequence of alternatives given in Column II by matching them with respective items in Column I:

Column I	Column II
A. Nominal GDP	(*i*) Year of comparison
B. Base year	(*ii*) $\frac{\text{Nominal GDP}}{\text{Price index}} \times 100$
C. Real GDP	(*iii*) Shows change in price level over time
D. Price Index	(*iv*) GDP at current prices

Alternatives:

(a) A—(*ii*), B—(*iii*), C—(*iv*), D—(*i*) (*b*) A—(*iii*), B—(*i*), C—(*iv*), D—(*ii*)

(c) A—(*iv*), B—(*i*), C—(*ii*), D—(*iii*) (d) A—(*ii*), B—(*iv*), C—(*i*), D—(*iii*)

INTERNSHIP

All students must try to enrol themselves for an internship programme or summer School programme which will allow experiential learning with a realistic approach. The internship can be done in any corporate office/ Shop /NGO which will allow the students to observe the management and financial aspects of the organization. A brief report of 250-300 words to be prepared and presented in the month of July.

Physical Education (048)

1. Draw a knock – out fixture for 25 teams with all step involved.
2. What do you mean by community sports programmes? Explain any three.
3. What do you understand by the female athlete triad? Explain the symptoms and it's causes.
4. Discuss the physical exercise as corrective measure for kyphosis , lordosis and Scoliosis.
5. Explain flat foot and knock me and also suggest for both postural deformities .
6. Write SAI khelo fitness test in practical file.