KENDRIYA VIDYALAYA TATANAGAR

AUTUMN BREAK HOLIDAY HOME WORK

SUBJECT-SOCIAL SCIENCE

CLASS-IX TH

SESSION-2023-2024

1.Write notes on any four points given below. (About 120 words each)

A . What was the main causes of French revolution &Russian revolution?

B. Write advantages of having healthy population.

C.Write autobiography of Hitler& Lenin

2.Map pointing

National Park-

 Manas, Simlipal, Bandipur, Rajaji, Dachigam, Dudhwa,Corbett,Gir, Kanha&Keoladeo(Ghana)

 Wildlife sanctuary –

 Periyar, Kawal

3.Prepare a project on Disaster management.

4.Prepare 10-10 mcqs following chapters.

 A. Electoral politics

 B. Drainage

 C. Climate

 D. People as resources

 E. Russian revolution

5. Make poster on Citizen Awareness on chart paper (size ¼ of chart paper) and write about citizen awareness including fundamental duties.

Sample Question Paper-1

(Issued by Board on 31st March, 2023)

English Language and Literature

Class- X, Session: 2023-24

SOLVED

Time Allowed: 3 hours   **Maximum Marks: 80**

General Instructions:

i.   *The Question Paper contains THREE sections-READING, GRAMMAR & WRITING and LITERATURE.*

ii. *Attempt questions based on specific instructions for each part.*

Section-A : Reading Skills   20 Marks

Reading Comprehension through Unseen passages

1. Read the following text.   **[10]**

(1) As a high school student, studying poetry can be a rollercoaster ride. This journey is punctuated by moments of profound appreciation for simpler pieces and intermittent frustration with more complex works. Let's be real here - some poems are just plain confusing and no amount of re-reading seems to help decipher the intended meaning. The puzzlement that results from such instances can be both vexing and demotivating. If solving a riddle is what was intended, then playing Sudoku is a better option. One is led to ponder if obscurity was the goal.

(2) Conversely, some pieces resonate with the reader's soul. stirring feelings of warmth, happiness, and connection to the world. Often, these compositions centre on themes that are universally understood, such as love, nature, or faith. Being able to actually understand what the poet is trying to say can feel like a little victory and is a welcome relief after grappling with more perplexing poetry.

(3) Then there are poems that are emotionally charged; the ones that make the reader curl up in a ball and cry or jump up and down with joy. One is left in awe of the poet's ability to convey emotion through words. Let's not forget the downright weird poems. These are the ones that defy categorization and leave the reader to their own devices in attempting to interpret meaning. The author's use of figurative language and unconventional imagery can create a sense of bewilderment that is either intriguing or off-putting. Regardless, the reader can appreciate the uniqueness of the work.

(4) Despite the wide range of emotions and reactions that come with studying poetry, it can be a rewarding pursuit. Not only does reading poetry allow one to appreciate the artistic beauty of the written word but also enables one to develop crucial critical thinking and analytical skills. The process of unlocking a poem's meaning can feel like cracking a code or solving a puzzle but the sense of accomplishment derived from mastering a challenging piece can be deeply gratifying. Finally, impressing an English teacher with a well-analysed poem can be a source of pride and validation.

(5) Overall, studying poetry is like a box of mixed chocolates, you never know what you're going to get. But whether it's complex, emotional, simple, or just downright weird, there's always something to be gained from the experience. So, let's applaud all the poets out there, for making us laugh, cry, scratch our heads, and occasionally feel like a genius.

Answer the following questions, based on the passage above.

(i) Which of the following statements best describes the author's attitude towards studying poetry?   **[1]**

   (A) Finds poetry to be a frustrating and meaningless endeavor.

   (B) Believes that the emotional rollercoaster of studying poetry is not worth the effort.

   (C) Recognizes the challenges of studying poetry but also acknowledges the rewards it offers.

   (D) Feels that poetry is too obscure and abstract for the average person to appreciate.

(ii) What is the tone of the writer in the given lines from paragraph (1)? Rationalise your response in about 40 words.   **[2]**

   If solving a riddle is what was intended, then playing Sudoku is a better option. One is led to ponder if obscurity was the goal.

(iii) Complete the sentence appropriately. [1]
The author's use of vivid imagery in the paragraph (3), such as "curl up in a ball and cry" and "jump up and down with joy", greatly affects the reader because _____.   .

(iv) The passage includes some words that are opposites of each other. From the sets (a)-(e) below, identify two sets of antonyms: [1]

    (a) intriguing and off-putting   (b) deciphering and interpreting
      (c) appreciate and applaud   (d) simple and challenging
           (e) emotions and feelings

(v) Complete the sentence appropriately.
We can say that the author's tone becomes more neutral and objective when discussing weird poems, compared to other types of poetry because _____. [1]

(vi) Based on the reading of the passage, examine, in about 40 words, how studying poetry can be like exploring a new city. [2]

(vii) What is the message conveyed by Hina's experience, in the following case? [1]
Hina spends hours trying to analyze a poem for her assignment and finally feels a sense of accomplishment and pride, once she understands.
    (A) Only those with natural talent for poetry should engage with it.
    (B) Persistence makes studying poetry a rewarding pursuit.
    (C) Study of poetry is guaranteed to impress others.
    (D) The efforts of studying poetry is inversely proportional to the rewards gained.

(viii) State whether the following lines display an example of a simple/complex/emotionally charged/downright weird, poem. [1]

The sun rises in the east,
A new day begins, a fresh start.
Birds chirp, nature wakes up,
A peaceful feeling in my heart.

2. Read the following text. [10]

(1) Reduction in green areas has caused various environmental problems. People squeezed between concrete structures are looking for various ways to meet their longing for green. One of the ways to do so, is vertical gardens and green walls. Vertical gardening is a unique method of gardening where plants are grown in a vertical position or upward, rather than in the traditional method of planting them on the ground.

(2) The purpose of vertical gardens and green walls, which arises from the studies of different disciplines (landscape architects, architects, engineers, etc.), is to close the cold image of concrete and increase the visual value. In these systems, nature and structures are integrated, and thus, urban areas and the desired environment have become intertwined.

(3) Vertical garden case studies often show that , though functionality should be in the foreground, when vertical gardens are planned, they are generally made as aesthetic elements in the city's underpasses and city squares, and decorative elements in residences, without seeking functionality.

(4) Experts support that the visual quality and evaluation of landscape architecture is determined based on the satisfaction of the users. Hence, a survey questionnaire was prepared for residents of varied age groups from of a metropolitan city. The given **Table 1**, displays these responses:

No.	Survey statements	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Table 1 - Total number of participants : 400					
Vertical gardens-						
1	improve quality of life of people in urban areas	191	138	43	9	19
2	reduce noise pollution	128	164	77	25	6
3	increase air quality -indoors and outdoors	172	147	51	28	2
4	reduce energy and water consumption	58	47	125	68	2
5	positively impact global warming	114	144	106	30	6
6	have a relaxing and calming effect	161	177	44	7	11
7	cost too much	86	107	152	42	13
8	make plants look beautiful	195	139	44	6	16
9	add naturalness to the environs	135	173	55	25	12
10	are among the determining factor to visiting a place	59	133	141	54	13
11	are inconvenient indoors	9	84	123	126	48

12	can be applied in every place	71	132	97	77	23
13	have a functional feature	81	207	100	10	2
14	distract drivers	34	101	106	131	28
15	funds are best used for social issues	57	72	100	130	41

(5) The study acknowledged that vertical gardening has the potential to transform urban spaces into green, sustainable areas, and further research should explore the impact of vertical gardening on the environment and human well-being.

Answer the following questions, based on the passage above.

(i) Complete the following analogy appropriately, based on your understanding of paragraphs 1 & 2.   **[1]**
We can say that the situation of people living in concrete structures is comparable with a fish living in a fishbowl, and the need for vertical gardens to the need for decorations in the fishbowl because _____.

(ii) Fill the blanks with the appropriate option from those given in brackets, based on your understanding of paragraph 2.   **[1]**
The statement that , urban spaces have become more closely connected with the desired natural surroundings through the incorporation of nature and structures in vertical gardens and green walls, is an _____ (fact/ opinion) because it is a _____ (subjective judgement/ objective detail).

(iii) Justify the following, in about 40 words.   **[2]**
While the survey results suggest that vertical gardens may be effective in improving the quality of life in urban areas, further research and evaluation may be necessary to fully understand their effectiveness and potential drawbacks.

(iv) Based on the survey results, which two concerns should a city government, looking to install vertical gardens, address?   **[1]**

(v) In Table 1, the statement 3, "Vertical gardens increase air quality - indoors and outdoors," received the most neutral responses from participants, with 51 respondents indicating a neutral stance. State any one inference that can be drawn from this.   **[1]**

(vi) Select the option that correctly displays what 'intertwined' signifies. (Reference-Paragraph 2)   **[1]**

    (i)   (ii)   (iii)   (iv)   (v)

(A) (i), (iv) and (v)   (B) Only (ii)
(C) Only (iii)   (D) (ii) and (v)

(vii) Infer one benefit and one drawback of vertical gardening, in comparison to other solutions, such as community gardens or parts. (Answer in about 40 words.)   **[1]**

(viii) Which of the following is the main takeaway from the study mentioned in the passage?
A. Vertical gardening has minimal impact on the environment or human well being.
B. Vertical gardening is a sustainable practice that can transform urban spaces into green areas.
C. The impact of vertical gardening on the environment and human well-being has already been thoroughly explored.
D. The study needs to include experts from horticultural firms to offer any recommendations for further research.   **[1]**

Section-B : Writing Skills & Grammar   20 Marks

Grammar   [1 × 10 = 10]

3. Complete ANY TEN of twelve of the following tasks, as directed.   **[1 × 10]**

(i) Fill in the blank by using the correct form of the word in the bracket, for the given portion of a letter: **[1]**
Dear Sir
This is with reference to committee's letter of recommendation that _____ (highlight) the nominations for 'Safe Residential Area' award for this current year.

(ii) Read the given sentence from a recipe review article. Identify the error and supply the correction in the sentence.   **[1]**
This delightful recipe must keep your hunger pangs at bay with its balanced spices and oriental flavour.
Use the given format for your response.

Error	Correction

(iii) Abhilash and Neha had a conversation about the inauguration of Neha's Dance Academy. Report Abhilash's question. [1]

Is your best friend helping you in this venture?

(iv) Read the dialogue between Shabnam and her mentor, Sara, regarding her summer internship programme.
Sara: Why did you choose to participate in this internship programme? [1]
Shabnam: Ah! I am convinced this programme has the potential to enhance my abilities.

Select the correct option to complete the reporting of the above dialogue.
Sara asked Shabnam _____ in that internship programme. Shabnam sighed and exclaimed that she was convinced that programme had the potential to enhance her abilities.
(A) why to choose to participate   (B) to choose participation
(C) about her choice to participate   (D) with her choice in participating

(v) Fill the blank by choosing the correct option, to complete the concluding line of an issued circular by an Organisation, to its Managers. [1]
A copy of the plan is enclosed and _____ (that/ then/ this) may be communicated to all Team Leaders for compliance.

(vi) Identify the error and supply correction for the given sentence from a commercial company's current marketing strategy. [1]
The company aimed at increasing authority in areas frequently visited by the clients.
Use the given format for your response.

Error	Correction

(vii) Select the option that identifies the error and supplies the correction for the closing line, from an analytical report. [1]
In conclusion, this study explores the association among short-sleep pattern and overweight youngsters.

Option No.	error	correction
A	explores	explore
B	and	or
C	among	between
D	In	for

(viii) Complete the given narrative, by filling the blank with the correct option. [1]
The experience of nursing an injured bird left me _____ grateful for knowing the importance of being kind and compassionate to all creatures.
(A) feeling   (B) having felt
(C) felt   (D) feels

(ix) Report the dialogue between a vendor and his customer, by completing the sentence: [1]
Vendor: It is nice to see you, Sir!
Customer: Yes, indeed! Unlike last month, I have been away for quite some time this month.
The vendor greeted his customer respectfully and mentioned that he was pleased to see him. The customer answered in the affirmative and explained that _____.

(x) Fill the blank by choosing the correct option to complete the live feed on a school news channel. [1]
Congratulations Change Makers!
The regional competition awards have been announced and our school music club _____ the first prize.
(A) had been won   (B) will win
(C) was winning   (D) has won

(xi) Complete the line from a self- awareness song, by filling the blank with the correct option. [1]
The river runs through your veins
The trees and mountains _____ your name
The moon and stars watch over
You're guiding your way back home
To dream the night away.
(A) will call   (B) call
(C) had called   (D) calls

(xii) Identify the error and supply correction for the following note in a passengers' flight instruction manual: **[1]**

> **NOTE:** Passengers will not reach the airport late in order to avoid a fine equivalent to 5% of the basic fare.

Use the given format for your response.

Error	Correction

Writing   [10 marks]

Note : All details presented in the questions are imaginary and created for assessment purpose.

4. **(a)** As Vaishali Nathani of 214, Indrayani Apartments, Vaishali Street, Daipur, you believe that forming Ecology clubs and appointing Eco-minders in your city can aid in the preservation and conservation of nature. Write a letter to the MLA of your city area, in about 120 words, suggesting the need to form such clubs. Share their importance and implications. Recommend the involvement of resident volunteers for implementation of eco-club activities that nurture and protect the local ecosystem. **[5]**

OR

   (b) As Armaan Khan, the School Literary Captain of Ujjwal Academy, Old City, Kiladerabad, you believe that languages can help bridge regional divides and promote unity. Write a letter to the Editor of a national daily, in about 120 words, suggesting the introduction of an online regional language learning programme managed and run by student councils and language clubs in the city. The programme aims to help residents who have recently relocated to a new region in picking up the local language organically. Share the importance and credibility of such a programme and suggest a feasible way to execute it along with possible activities. **[5]**

5. **(a)** Tsering, of class X, is contesting for the post of the Junior School Captain, in the upcoming student council elections. Given below is her character traits' graphic, shared in the public domain, by the school counsellor, for the awareness of student voters, at school. **[5]**
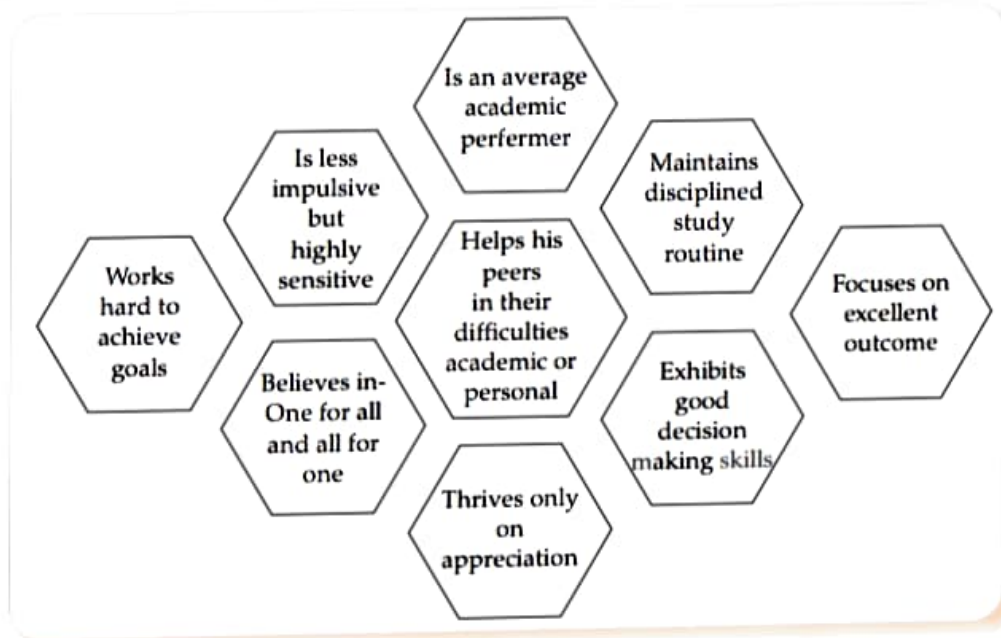
All Tsering's peers have been asked to write a paragraph in about 120 words, analysing these traits, to either support or oppose her candidature. As one of her peers, write this analytical paragraph, by selecting some of the traits that support your analysis.

You may begin like this :
As a responsible student voter, I believe Tsering possesses / does not possess the necessary traits to be a School Captain.

You may end like this:
For these reasons, I believe she has / does not have the potential to be a good School Captain and I support / oppose her candidature.

OR

(b) As the Captain of the school's Cultural Club, you have been asked to study the given itinerary provided by a tour-organizing vendor.

A 3N/2D Educational Tour for the Senior School Students:
Jabalpur and Kanha National Park (Vandhya Pradesh)

- Tour Travel & sightseeing by bus.
- Accommodation on quad sharing basis.
- One staff complimentary for every 20 students.
- Bottled mineral water throughout the tour.
- Dance Party on 22 November.
- Insurance policy of ₹ 20,000/- per head.
- Provision of Tour Manager's assistance to all places.

Day	Estimated time of departure from	Estimated time of arrival	Sight-seeing Destination/Activity	Time spent at the destination
22 Nov. 2023	8:49 am (Nagpur Junction)- 8 hrs. 30 min	5:23 pm	Reporting at the hotel	
23 Nov. 2023	9:00am (hotel)	10:00 am	Bhawartal Garden	1 hr.
	11:00 am (garden)	11:40 am	Bhedaghat Dhuandhar Falls	1hr.
	12:40 pm (falls)	1:00 pm	Lunch (nearby restaurant)	1 hr.
	2:00 pm (restaurant)	2:15 pm	Marble Rocks Cable car tour	1hr. 30 mins
	3:45 pm (Marble Rocks)	4:45 pm	Rani Durgavati Museum	1 hr. 30 mins
	6:15 pm (museum)	7:00pm	Back to the hotel	
24 Nov., 2023	5:30 am (hotel)- 170 kms- 4 hrs. drive	9:30am	Kanha Tiger Reserve	7hrs.
	4:30 pm (Tiger Reserve)	9:00pm	Back to the hotel	
25 Nov., 2023	7:54 am (Jabalpur Railway station)- 8 hrs. 45 min	4:21 pm	Nagpur Railway Junction	

Analyse this itinerary to either <u>approve or reject</u> the tour proposal, while focusing on the students' safety, interest, and physical wellness. Write this analytical paragraph in about 120 words, by selecting features that support your analysis.

You may begin like this :

A thorough analysis of the itinerary provided by the tour organizing vendor reveals that the tour proposal should be accepted / rejected.

You may end like this:

Therefore, the tour proposal for the educational trip should be approved / rejected.

Section-C : Literature Textbook and
Supplementary Reading Text
40 Marks

6. Read the given extracts and answer the questions for ANY ONE of the two, given. **[5]**

(A) The question he tried to answer was simple: What is the purpose of the twelve tiny gold spots on a monarch pupa?

"Everyone assumed the spots were just ornamental," Ebright said. "But Dr Urquhart didn't believe it."

To find the answer, Ebright and another excellent science student first had to build a device that showed that the spots were producing a hormone necessary for the butterfly's full development. This project won Ebright first place in the county fair and entry into the International Science and Engineering Fair. There he won third place for zoology. He also got a chance to work during the summer at the entomology laboratory of the Walter Reed Army Institute of Research. *(The Making of a Scientist)*

(i) State any one inference about Dr Urquhart from the given context: **[1]**

Everyone assumed the spots were just ornamental," Ebright said.
"But Dr Urquhart didn't believe it."

(ii) State TRUE or FALSE.   [1]

None of the terms (a) -(d) below, can be applied to the question - What is the purpose of the twelve tiny gold spots on a monarch pupa?

(a) A hypothesis - a proposed explanation for a phenomenon

(b) An assumption - something that is taken for granted or assumed to be true without proof

(c) A premise - a proposition that forms the basis of an argument

(d) A theory - a well-substantiated explanation for a natural phenomenon

(iii) Ebright's approach towards finding the purpose of the gold spots on a monarch pupa was highly effective. Elaborate in about 40 words, with reference to the extract.   [2]

(iv) Which phrase would correctly substitute 'a chance' , in the given sentence from the extract.   [1]

He also got a chance to work during the summer at the entomology laboratory of the Walter Reed Army Institute of Research.

OR

(B) **LOMOV** : It's cold... I'm trembling all over, just as if I'd got an examination before me. The great thing is , I must have my mind made up. If I give myself time to think, to hesitate, to talk a lot, to look for an ideal, or for real love, then I'll never get married. Brr...It's cold! Natalya Stepanovna is an excellent housekeeper, not bad-looking, well-educated. What more do I want? But I'm getting a noise in my ears from excitement. (Drinks) And it's impossible for me not to marry. In the first place, I'm already 35— a critical age, so to speak. In the second place, I ought to lead a quiet and regular life. I suffer from palpitations, I'm excitable and always getting awfully upset; at this very moment my lips are trembling, and there's a twitch in my right eyebrow.

(The Proposal)

(i) Which of the following is NOT a reason why Lomov thinks he must marry?   [1]

(a) He is already 35 years old.   (b) He suffers from palpitations.

(c) He is excitable and easily upset.   (d) He is in love with Natalya.

(ii) Why is it fair to say that Lomov's tone, when he says "What more do I want?", is uncertain and questioning? Answer in about 40 words.   [2]

(iii) Read the following descriptions (a)-(c) and identify which one correctly corresponds to the extract.   [1]

(a) A debate is a formal discussion on a particular topic, usually with two or more people presenting different viewpoints and arguments.

(b) A soliloquy is a speech given by a character alone on stage, which reveals their innermost thoughts and feelings to the audience.

(c) An aside is a brief comment or remark made by a character directly to the audience, which is not intended to be heard by other characters on stage.

(iv) If an actor were to enact this extract, what would he be required to focus on, while modulating his voice?   [1]

7. Read the given extracts and answer the questions for ANY ONE of the two, given.   [5]

(A) But if it had to perish twice,
I think I know enough of hate
To say that for destruction ice
Is also great
And would suffice.
(Fire and Ice)

(i) Fill the blank with one word.

When the speaker says that ice could also bring about the end of the world, he refers to _____ , as the means for destruction.   [1]

(ii) What does the speaker's alignment with those who favour ice, suggest?   [1]

(iii) Which of the following best describes the speaker's attitude towards destruction caused by ice?   [1]

(a) Indifferent   (b) Fearful

(c) Dismissive   (d) Respectful

(iv) Comment on the poet's use of language in these lines.   [2]

OR

(B) The fog comes
on little cat feet.
It sits looking
over harbour and city
on silent haunches
and then moves on.
(Fog)

(i) In what way does the language used in this poem challenge traditional ideas of what poetry should be?[1]

(ii) What is the significance of the use of the word "little" to describe the fog in the poem and how does this word choice contribute to the overall mood and tone of the poem? Answer in about 40 words.   [2]

(iii) Complete the sentence with the appropriate option. The lines from the poem tell us that the city is
_____.

(A) hilly   (B) coastal
(C) industrial   (D) under-developed   [1]

(iv) Identify the type of imagery used in the lines of the poem.   [1]

8. **Answer ANY FOUR of the following five questions, in about 40-50 words.**   4 × 3 = 12
   (i) Justify the opinion that the traditional baker and his bread play a significant role in the cultural and social
   fabric of Goan society. (*Glimpses of India-I*)   [3]
   (ii) How does Leslie Norris use vivid imagery and metaphorical language in *A Tiger in the Zoo*, to effectively
   depict the confinement and oppression, experienced by the captive tiger.   [3]
   (iii) Explain how the description of the devastation caused by the hailstorm reflects the sadness within Lencho,
   in A Letter to God?   [3]
   Refer to the given lines, from the text-
   *Not a leaf remained on the trees. The corn was totally destroyed. The flowers were gone from the plants. Lencho's soul
   was filled with sadness.*
   (iv) Kitty was a trusted friend to Anne. Elaborate.   [3]
   (From the Diary of Anne Frank)
   (v) How does Ogden Nash's *The Tale of Custard the Dragon*, challenge the notion that individuals should conform
   to societal expectations?   [3]

9. **Answer ANY TWO of the following three questions, in about 40-50 words.**   2 × 3 = 6
   (i) The story, A Triumph of Surgery is a powerful example of the importance of saying "no". Explain.   [3]
   (ii) How does education play a transformative role in Bholi's life? (Bholi)   [3]
   (iii) The various elements of Robert Arthur's writing style work together to create a sense of tension, uncertainty,
   and suspense, well-suited to the mystery and suspense genre of the story, The Midnight Visitor. Comment,
   with reference to any one element.   [3]

10. **Answer ANY ONE of the following two questions, in about 100-120 words.**   1 × 6 = 6
   (A) You have been asked to present an evaluation of the approaches of the mothers of both, the baby seagull and
   Amanda, towards helping their children. Write this presentation draft including your insights, in about 120
   words, comparing the approaches of both parents.
   You may begin this way:
   One acknowledges that both parents, Amanda's mother and the baby seagull's mother both....however, ...
   (**Reference:** *Amanda! & His First Flight*)

   OR

   (B) You have been chosen to address a student gathering from the neighbourhood schools, to speak on the
   resilience of human spirit required to transcend discrimination. Prepare the speech draft in not more than
   120 words, with reference to the commonality of themes in Nelson Mandela: Long Walk to Freedom and
   The Trees by Adrienne Rich.
   You may begin this way:
   *Good morning, everyone. Today, I'd like to discuss two pieces of literature that offer a powerful insight into the resilience
   of the human spirit required to transcend discrimination.*

   You may end this way:
   To conclude, I'd like to say that ...
   Thank you

11. **Answer ANY ONE of the following two questions, in about 100-120 words.**   1 × 6 = 6
   (A) Imagine that M. Loisel, from *The Necklace* by Guy de Maupassant, writes a diary entry, exploring the theme
   of class and social status, and the nature of social mobility, in the context of his own experience.
   Write this diary entry , as M. Loisel, in about 120 words.

   OR

   (B) A character arc is the transformation or development of a character throughout a story and refers to the
   changes a character undergoes as a result of their experiences, challenges, and interactions with other
   characters.
   In the light of the above information, trace the character arc of the thief in Ruskin Bond's *The Thief's Story*,
   in about 120 words.

KENDRIYA VIDYALAYA TATANAGAR
HOLIDAY HOMEWORK (Autumn Break)
SESSION-2023-24
SOCIAL SCIENCE
CLASS - X

1. Map work-locate following places Chapter wise on the map of India:
   Agriculture: Major areas of Rice and Wheat, largest/Major producer of Sugarcane, Tea, Coffee, Rubber, cotton and Jute
   Mineral and Energy Resources
   I.Iron ore mines. II. Coal fields. III. Oil fields. IV. Thermal power plants V. Nuclear power plants
   Manufacturing Industries

   i.   **Cotton Textile Industries:** a. Mumbai   b. Indore c. Surat d. Kanpur   e. Coimbatore

   ii. **Iron and Steel Plants:**

       a. Durgapur
       b. Bokaro
       c. Jamshedpur
       d. Bhilai
       e. Vijaynagar
       f. Salem
   iii. **Software Technology Parks**:

       a. Noida
       b. Gandhinagar
       c. Mumbai
       d. Pune
       e. Hyderabad
       f. Bengaluru
       g. Chennai
       h. Thiruvananthapuram

3. Revision of the chapters taught from April to October. Prepare 10 Multiple choice questions from each chapter.

4. Prepare a project on Disaster management.

Note: Project to be done separately in file paper.

AUTUMN BREAK HOMEWORK

CLASS – VI

MATHS

1. Learn AND Write tables from 1-20 in your fair notebook.
2. Revise any five examples of Chapter – 7 Fractions and Chapter – 8 Decimals each in your fair notebook.
3. Complete your Learner's Diary. (Format is already in your class group). This Learner's diary is of second term and it will be done in the learner's diary of first term.
4. Complete your Multi Disciplinary Project in a folder of ruled A4 size sheets.

MULTI DISCIPLINARY PROJECT TOPIC : TREES

FRAME WORK

● THE COVER PAGE

● CERTIFICATE

● ACKNOWLEDGEMENT

● INDEX

● CONTENTS- ACTIVITY-WISE (WITH PAGE NO:)

ACTIVITIES

●COLLECT INFORMATION REGARDING NUMBER OF TREES (COCONUT TREE,

MANGO TREE, JACKFRUIT TREE, PEEPAL TREE, BANYAN TREE,NEEM TREE ETC.)

FOUND IN YOUR LOCALITY (SCHOOL,HOUSING COLONY ETC.)

●PRESENT THE COLLECTED DATA IN A TABULAR FORM FOLLOWED BY SUITABLE

GRAPHICAL REPRESENTATION (BAR GRAPH, PICTOGRAPH ETC.)

●ANALYSE THE DATA TO ANSWER THE FOLLOWING QUESTIONS :

1. WHICH TREE IS FOUND MOST ABUNDANTLY?

2.WHICH TREE IS FOUND SCARCELY ?

● PASTE THE PICTURES OF DIFFERENT TYPES OF PLANTS OR TREES GROWN IN YOUR AREA.

(DAY -1 :- 20/10/2023)
RELATIONS & FUNCTIONS

1. Let A and B be two finite sets with n (A) = m and n (B) = n with m = n then find the number of bijective functions from A to B.

2. Let A = {1,2,3}. Find the number of equivalence relations containing (1,2) .

3. If A = {1,2,3}, B = {4,6,9} and R is a relation from A to B defined by ' x is smaller than y'. Write the range of R.

4. *State whether* The relation R = { (1,1),(2,2),(3,3)} on {1,2,3} is equivalence relation or not.

5. Let A = **R** – {3} and B = **R** – {1}. Consider the function f : A →B defined by

   f (x) = $\left(\dfrac{x-2}{x-3}\right)$ Is f one-one and onto? Justify your answer

6. Consider a function f : R₊⟶[-5, ∞) defined f(x) = 9x² +6x – 5. Show that f is one- one and onto function, Where R₊ is the set of all non-negative real numbers.

7. Show that the function f: R ⟶ {x∈R :-1 < x < 1} defined by f(x) = $\dfrac{x}{1+|x|}$, x ∈R is one-one and onto function.

8. Show that the relation R in the set A = {1, 2, 3, 4, 5} given by R = {(a, b) : |a – b| is even}, is an equivalence relation. Show that all the elements of {1, 3, 5} are related to each other and all the elements of {2, 4} are related to each other. But no element of {1, 3, 5} is related to any element of {2, 4}.

9. Show that each of the relation R in the set A = {x ∈**Z** : 0 ≤ x ≤ 12}, given by R = {(a, b) : |a – b| is a multiple of 4} is an equivalence relation. Find the set of all elements related to 1.

10. Let N denote the set of all natural numbers and R be the relation on N×N defined by $(a,b)\,R\,(c,d) \Leftrightarrow ad(b+c) = bc(a+d)$ prove that R is an equivalence relation on N×N.

(DAY -2 :- 21/10/2023)
INVERSE TRIGONOMETRIC FUNCTIONS

* Domain & Range of the Inverse Trigonometric Function :

	Functions	Domain	Range (Principal value Branch)
I.	$\sin^{-1}$:	$[-1,1]$	$[-\pi/2, \pi/2]$
II.	$\cos^{-1}$:	$[-1,1]$	$[0, \pi]$
III.	$\csc^{-1}$:	$R-(-1,1)$	$[-\pi/2, \pi/2]-\{0\}$
IV.	$\sec^{-1}$:	$R-(-1,1)$	$[0, \pi]-\{\pi/2\}$
V.	$\tan^{-1}$:	R	$(-\pi/2, \pi/2)$
VI.	$\cot^{-1}$:	R	$(0, \pi)$

1). Find the principal value of $\sec^{-1}(-2)$.

2) Find the principal value of $\sin^{-1}\left(\cos\dfrac{2\pi}{3}\right)$.

3) Find the principal value of $\cot^{-1}\left(\tan\dfrac{3\pi}{4}\right)$.

4). Find the value of $\sin^{-1}\left\{\cos(\sin^{-1}\dfrac{\sqrt{3}}{2})\right\}$.

5). Find the value of $\cot\left[\sin^{-1}\left\{\cos\left(\tan^{-1}1\right)\right\}\right]$.

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

7) Evaluate :- $\cos^{-1}\left(\cos\dfrac{2\pi}{3}\right)+\sin^{-1}\left(\sin\dfrac{2\pi}{3}\right)$ 8) Evaluate :- $\cos^{-1}\left(\cos\dfrac{7\pi}{6}\right)$

9) Write the principal value of $\tan^{-1}\left(\sqrt{3}\right)-\cot^{-1}\left(-\sqrt{3}\right)$.

10) Write the value of $\tan^{-1}\left[2\sin\left(2\cos^{-1}\dfrac{\sqrt{3}}{2}\right)\right]$

ANSWERS

1). $\dfrac{2\pi}{3}$	2). $-\dfrac{\pi}{6}$	3) $-\dfrac{\pi}{4}$	4) $\dfrac{3\pi}{4}$	5) $\dfrac{\pi}{6}$

6) $\dfrac{5\pi}{6}$	7) $\dfrac{5\pi}{3}$	8) $\dfrac{5\pi}{6}$	9) $\dfrac{\pi}{2}$	10 $-\dfrac{\pi}{3}$

(DAY -3 :- 22/10/2023)
MATRICES

1) If $[2x\ 3\ ][\ 1\ 2\ -3\ 0\ ][x\ 8\ ] = O$, find x.

2) Find the matrix P satisfying the matrix equation $\begin{bmatrix} 2 & 1 \\ 3 & 2 \end{bmatrix} P \begin{bmatrix} -3 & 2 \\ 5 & -3 \end{bmatrix} = \begin{bmatrix} 1 & 2 \\ 2 & -1 \end{bmatrix}$. Also find a matrix Q such that P + Q = O, where O is a zero matrix

3) If $A = \begin{bmatrix} 0 & -\tan\dfrac{\alpha}{2} \\ \tan\dfrac{\alpha}{2} & 0 \end{bmatrix}$ and $I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$. Prove that $I + A = (I - A)\begin{bmatrix} \cos\alpha & -\sin\alpha \\ \sin\alpha & \cos\alpha \end{bmatrix}$

4) If $A = \begin{bmatrix} 3 & 1 \\ 7 & 5 \end{bmatrix}$, find x and y such that $A^2 + xI = yA$. Also find the value of $(x - y)$.

5) For what value of x: $[1\ 2\ 1\ ][1\ 2\ 0\ 2\ 0\ 1\ 1\ 0\ 2\ ][0\ 2\ x\ ] = O$. Use the value of x to find A^2, if
$A = [\ x\ -x\ -x\ x\ ]$.

6) If $A = [3\ -5\ -4\ 2\ ]$, show that $A^2 - 5A - 14I = O$.

7) Let $A = [2\ -1\ 3\ 4\ ]$, $B = [5\ 2\ 7\ 4\ ]$, $C = [2\ 5\ 7\ 4\ ]$. Find a matrix D such that
CD − AB = O.

8) Express $A = \begin{bmatrix} 3 & 2 & 3 \\ 4 & 5 & 3 \\ 2 & 4 & 5 \end{bmatrix}$ as the sum of a symmetric(P) and a skew-symmetric (Q) matrix. Also find $P^T + Q^T$.

9) If $A = [1\ 2\ 2\ 2\ 1\ 2\ 2\ 2\ 1\ ]$, then prove that $A^2 - 4A - 5I = 0$ and, hence find A^{-1}.

10) Let $A = [2\ 3\ -1\ 2\ ]$ and $f(x) = x^2 - 4x + 7$. Show that $f(A) = O$. Use this result to find A^5.

ANSWERS

1) $x = 0, x = \dfrac{-23}{2}$ 2) P= $[\ 25\ \ 15\ -37\ -22\ ]$, $Q = [\,-25\ -15\ \ 37\ \ 22\ ]$ 4) . x = 8, y = 8; 0

5) $x = -1$, $A^2 = \begin{bmatrix} 2 & -2 & -2 & 2 \end{bmatrix}$ 7. $D = \begin{bmatrix} -191 & -110 & 77 & 44 \end{bmatrix}$ 8)

$$\begin{bmatrix} 3 & 3 & 5/2 \\ 3 & 5 & 7/2 \\ 5/2 & 7/2 & 5 \end{bmatrix} + \begin{bmatrix} 0 & -1 & 1/2 \\ 1 & 0 & 1/2 \\ -1/2 & 1/2 & 0 \end{bmatrix}$$; $[3\ 4\ 2\ 2\ 5\ 4\ 3\ 3\ 5]$

9) $A^{-1} = \begin{bmatrix} -3 & 2 & 2 & 2 & -3 & 2 & 2 & 2 & -3 \end{bmatrix}$ 10. $\begin{bmatrix} -118 & -93 & 31 & -118 \end{bmatrix}$

(DAY -4 :- 23/10/2023)
Determinants

1. Using matrix method, solve: $x + y + z = 6$; $y + 3z = 11$; $x - 2y + z = 0$
2. Using matrix method, solve: $3x - 2y +3z = 8$; $2x + y - z = 1$; $4x - 3y + 2z = 4$
3. Solve the system using matrices: $\frac{2}{x} + \frac{3}{y} + \frac{10}{z} = 4$; $\frac{4}{x} - \frac{6}{y} + \frac{5}{z} = 1$; $\frac{6}{x} + \frac{9}{y} - \frac{20}{z} = 2$
4. If $A = \begin{bmatrix} 2 & 3 & 1 & -3 & 2 & 1 & 5 & -4 & -2 \end{bmatrix}$, find A^{-1} and use it to solve the system of equations:

    $2x - 3y + 5z = 11$, $3x + 2y - 4z = -5$, $x + y - 2z = -3$

5. Using matrices, solve the following system of equations:
    (i) $x + 2y - 3z\ \ = -4$
          $2x + 3y + 2z\ = 2$
          $3x - 3y - 4z\ = 11$
    (ii) $4x + 3y + 2z\ = 60$
          $x + 2y + 3z\ \ = 45$
          $6x + 2y + 3z\ = 70$
6. Find the product AB, where $A = \begin{bmatrix} -4 & 4 & 4 & -7 & 1 & 3 & 5 & -3 & -1 \end{bmatrix} \begin{bmatrix} 1 & -1 & 1 & 1 & -2 & -2 & 2 & 1 & 3 \end{bmatrix}$ and use it to
    solve the equations: $x - y + z = 4$, $x - 2y - 2z = 9$, $2x + y + 3z = 1$

7. Using matrices, solve the following system of equations:
    $$\frac{1}{x} - \frac{1}{y} + \frac{1}{z} = 4; \qquad \frac{2}{x} + \frac{1}{y} - \frac{3}{z} = 0, \qquad \frac{1}{x} + \frac{1}{y} + \frac{1}{z} = 2$$

8. Find the product AB, where $A = \begin{bmatrix} 1 & -1 & 2 \\ 0 & 2 & -3 \\ 3 & -2 & 4 \end{bmatrix}$ and B $= \begin{bmatrix} -2 & 0 & 1 \\ 9 & 2 & -3 \\ 6 & 1 & -2 \end{bmatrix}$ and
    use it to solve: $x - y + 2z = 1$, $2y - 3z = 1$, $3x - 2y + 4z = 2$.
9. Find A^{-1} if $A = \begin{bmatrix} 0 & 1 & 1 & 1 & 0 & 1 & 1 & 1 & 0 \end{bmatrix}$ and show that $A^{-1} = \frac{A^2 - 3I}{2}$.
10. Given $A = \begin{bmatrix} 2 & 2 & -4 & -4 & 2 & -4 & 2 & -1 & 5 \end{bmatrix}$, $B = \begin{bmatrix} 1 & -1 & 0 & 2 & 3 & 4 & 0 & 1 & 2 \end{bmatrix}$, find BA and use this to solve the system of equations: $y + 2z = 7, x - y = 3, 2x + 3y + 4z = 17$.

ANSWERS
1. $x = 1$, $y = 2$, $z = 3$ 2. $x = 1$, $y = 2$, $z = 3$ 3. $x = 2$, $y = 3$, $z = 5$
4. $x = 1$, $y = 2$, $z = 3$ 5. (i) $x = 3$, $y = -2$, $z = 1$ (ii) $x = 5$, $y = 8$, $z = 8$
6. $AB = 8I$, $x = 3$, $y = -2$, $z = -1$ 7. $x = \frac{1}{2}$, $y = -1$, $z = 1$
8. $x = 0$, $y = 5$, $z = 3$ 9. $A^{-1} = \begin{bmatrix} -1 & 1 & 1 & 1 & -1 & 1 & 1 & 1 & -1 \end{bmatrix}$ 10. $x = 2$, $y = -1$, $z = 4$

CONTINUITY AND DIFFERENTIABILITY

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

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

3. If $f(x) = \begin{cases} \dfrac{1 - \sin^3 x}{3\cos^2 x}, & \text{if } x < \dfrac{\pi}{2} \\ a & \text{if } x = \dfrac{\pi}{2} \\ \dfrac{b(1 - \sin x)}{(\pi - 2x)^2} & \text{if } x > \dfrac{\pi}{2} \end{cases}$ is continuous at $x = \dfrac{\pi}{2}$, find a, b.

4. If $y = (\log_e x)^x + x^{\log_e x}$ find $\dfrac{dy}{dx}$.

5. If $x = a(\theta - \sin\theta)$, $y = a(1 + \cos\theta)$, find $\dfrac{d^2 y}{dx^2}$ at $\theta = \dfrac{\pi}{2}$

6 If $x = a\left(\cos\theta + \log\tan\dfrac{\theta}{2}\right)$ and $y = a\sin\theta$ find $\dfrac{dy}{dx}$ at $\theta = \dfrac{\pi}{4}$.

7. If $y = \sin(m\sin^{-1} x)$, prove that $(1 - x^2)\dfrac{d^2 y}{dx^2} - x\dfrac{dy}{dx} + m^2 y = 0$

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

9. If $x\sqrt{1+y} + y\sqrt{1+x} = 0$, $-1 < x < 1$, prove that $\dfrac{dy}{dx} = -\dfrac{1}{(1+x)^2}$

10. If $y = \sqrt{x + \sqrt{x + \sqrt{x + \ldots \ldots \infty}}}$, then find $\dfrac{dy}{dx}$.

11. If $(\cos x)^y = (\sin y)^x$, then find $\dfrac{dy}{dx}$.

ANSWERS

1. $k = -1$	**2** $a = 3, b = 2$	$a = \dfrac{1}{2}$, **3.** $b = 4$

(DAY -6 :- 25/10/2023)
APPLICATION OF DERIVATIVES

1. Find the intervals in which function $f(x) = 2x^3 - 15x^2 + 36x + 1$ is strictly increasing or strictly decreasing.

2. Find the intervals in which function $f(x) = \sin x - \cos x, \ 0 \le x \le 2\pi,$ is strictly increasing or strictly decreasing.

3. . Find the absolute maximum and minimum values of a function f given by $f(x) = 2x^3 - 15x^2 + 36x + 1$ on the interval [1, 5].

4. A man whose height is 2 m walks at a uniform speed of 6 m/minutes away from a lamp post 5 m high. Find the rate at which the length of his shadow increases.

5. Water is leaking from a conical funnel at the rate of 5 cm^2/s. If the radius of the base of the funnel is 5 cm and the altitude is 10 cm, find the rate at which the water level is dropping when it is 2.5 cm from the top.

6. The length x of a rectangle is decreasing at the rate of 3 cm/minute and the width y is increasing at the rate of 2cm/minute. When x =10cm and y = 6cm, find the rates of change of (a) the perimeter and (b) the area of the rectangle.

7. The volume of a cube is increasing at the rate of 8 cm^3/s. How fast is the surface area increasing when the length of an edge is 12 cm?

8. Show that the volume of the largest cone that can be inscribed in a sphere of radius R is 8/27 of the volume of the sphere.

9. 17. Show that semi-vertical angle of right circular cone of given surface area and maximum volume is Sin^{-1}(1/3).

10. An open box with a square base in to be made out of a given quantity of sheet of area c^2. Show that the maximum volume of the box is $\frac{c^3}{6\sqrt{3}}$.

11. A rectangular sheet of tin 45 cm by 24 cm is to be made into a box without top by cutting off squares from each corner and folding up the flaps. What should be the side of the square to be cut off so that the volume of the box is the maximum possible?

12. Find the interval in which the function f given by $f(x) = x^2 e^{-x}$ *is* strictly increasing.

1. 1. $\int \dfrac{1}{\sqrt{x}+x}dx$ 2. *Evluate*: $\int \sqrt{\tan\tan x}\ dx$

    3. $\int \dfrac{1}{\sin(x-a).\cos(x-b)}dx$ 4. $\int \tan x.\tan 2x.\tan 3x\ dx$

5. $\int \dfrac{\sin x-x\cos x}{x(x+\sin x)}dx$ 6. $\int \dfrac{1}{(\sqrt{x}+\sqrt[3]{x})}dx$ 7. $\int \dfrac{x^4+1}{x^2+1}dx$ 8. $\int \dfrac{xx}{\sqrt{1-x^2}}dx$

9. $\left(\int e^{2x}\dfrac{1+\sin 2x}{1+\cos 2x}\right)dx$ 10. $\int \dfrac{\sec^4 x}{\sqrt{\tan x}}dx$ 11. $\int_{\frac{\pi}{4}}^{\frac{\pi}{2}}\sqrt{1+\sin 2x}\ dx$

12. If $\int_a^b x^3 dx = 0$ and if $\int_a^b x^2 dx = \dfrac{2}{3}$ find a and b.

13.

Evaluate: $\int_{\frac{\pi}{4}}^{\frac{\pi}{2}}\cos x.\log(\sin x)dx$

14. *Evaluate*: $\int_1^3 \left(\lceil x-1\rceil + \lceil x-2\rceil + \lceil x-3\rceil\right)dx$

15.

$$\int_0^{\pi/4}\log(1+\tan\tan x)\ dx \quad 16.\ Prove\ that:\ \int_0^{\frac{\pi}{2}}\sin 2x.\log(\tan x)dx = 0$$

17. Evaluate:

$\int_0^{\frac{\pi}{2}}\dfrac{x\sin x}{1+\cos^2 x}dx$

18. *Evaiuate*: $\int_{-2}^{2}\dfrac{x^2}{1+5^x}dx$

19.

$\int_0^{\frac{\pi}{2}}2\sin x.\cos x.(\sin x)\ dx$

20. $\int_0^1 \dfrac{\log(1+x)}{1+x^2}dx$

Answer

1. $2\log_e\left|1+\sqrt{x}\right|+C$ 2. $\dfrac{1}{\sqrt{2}}(\dfrac{\tan x-1}{\sqrt{2\tan x}}+\dfrac{1}{2\sqrt{2}}\log/\dfrac{\tan x-\sqrt{2\tan x}+1}{\tan x+\sqrt{2\tan x}+1}/+c$

3. $\dfrac{1}{\cos(x-b)}[\log\sin(x-a)-\cos(x-b)]+c$

4. $\dfrac{1}{3}\log\cos 3x+\dfrac{1}{2}\log\cos 2x+\log\cos x+c$ 5. log x- log(x+sinx)+c

6. $2\sqrt{x}-3\sqrt[3]{x}+6x^{\frac{1}{6}}-6\log(x^{\frac{1}{6}}+1)+c$ 7. $\dfrac{x^3}{3}-x+2x+c$

8. $-\sqrt{1-x^2}x+x+c$ 9. $\dfrac{1}{2}e^{2x}\tan x+c$ 10. $2\sqrt{\tan x}+\dfrac{2}{5}\tan^{\frac{5}{2}}x+c$

11. $\sqrt{2}$ -1 **12.** A=-1, b=1 **13.** $\frac{1}{4}log2 - \frac{\pi}{8} + \frac{1}{4}$ **14.** 5 **15.** $\frac{\pi}{8}$ log 2

17. $\frac{\pi^2}{4}$ **18.** $\frac{8}{3}$ **19.** $\frac{\pi}{2} - 1$ **20.** $\frac{\pi}{8}log2$

(DAY -8 :- 27/10/2023)
APPLICATION OF INTEGRATION

1. Find the area enclosed by the circle $x^2 + y^2 = 2$.
2. Find the area of the region bounded by the curve $y = x^2$ and the line $y = 16$.

3. Find the area of the region bounded by the curve $y = \sqrt{16 - x^2}$ and x-axis.

4. Find Area of the region bounded by $y^2 = 4x$, y-axis, and the line y = 3.

5. Find The area of the region bounded by the curve x = 2y + 3 and the y lines,
   $y = 1$ and $y = -1$

6. Sketch the region of the ellipse $\frac{x^2}{25} + \frac{y^2}{16} = 1$ and find its area, using integration.

7. Sketch the graph of y = $|x + 3|$ and evaluate the area under the curve y = $|x + 3|$ above x-axis and between x = -6 to x = 0. using integration.

8. Find the area of the region bounded by x² = 4y, y = 2, y = 4 and the y-axis in the first quadrant using integration

9. Find the Area of Triangle having vertices A (2 , 3) , B (4 , 7) C (6 , 2)

10. Find the Area of Triangle bounded by lines :- 3x +3 - 2y = 0 , x + 2y -7 = 0 , x-2y+1=0

Answers:
1. 2π sq units
2. $\frac{256}{3}$ sq units
3. 8π sq units
4. $\frac{9}{4}$ sq units
5. 6 sq units
6. 20π sq units
7. 9 Sq. units
8. $16 - 4\sqrt{2}$ sq. units
9. 9 sq units
10. 4 sq units

1. Find the particular solution of the differential equation

   $\left(1+e^{2x}\right)dy+\left(1+y^2\right)e^x=0$; given that y=1 and x=0

2. Find the particular solution of the differential equation

   $\log\left(\dfrac{dy}{dx}\right)=3x+4y,$ given that y=0 when x=0

3. Solve the following differential equation :

   $\left(x\sin^2\dfrac{y}{x}-y\right)dx+xdy=0$

4. Solve the following differential equation :

   $xdy-ydx=\sqrt{x^2+y^2}\,dx$

5. Find the solution of the differential equation

   $(xdy-ydx)y\sin\left(\dfrac{y}{x}\right)=(ydx+xdy)x\cos\left(\dfrac{y}{x}\right)$

6. Solve the following differential equation:

   $x\log x\dfrac{dy}{dx}+y=\dfrac{2}{x}\log x$

7. Solve the differential equation:

   $x\dfrac{dy}{dx}+y-x+xy\cot x=0, x\neq 0$

8. Find the particular solution of the differential equation

   $\dfrac{dy}{dx}+y\cot x=2x+x^2\cot x, x\neq 0$ given that y= 0 and x = pie / 2

9. Find the general solution of the differential equation

   $ydx-(x+2y^2)dx=0$

10.. solve the differential equation

   $\left(\tan^{-1}y-x\right)dy=(1+y^2)dx$

Answer

1. $\tan^{-1} y + \tan^{-1} e^{x} = \dfrac{\pi}{2}$
   2. $4e^{3x} + 3e^{-4y} = 7$
   3. $\cot\left(\dfrac{y}{x}\right) = \log|x| + c$

(b) $y + \sqrt{x^2 + y^2} = cx^2$
   5. $\sec\left(\dfrac{y}{x}\right) = cxy$

6. $y \log x = -\dfrac{2}{x}(1 + \log x) + c$
   7. $y = \dfrac{1}{x} - \cot x + \dfrac{c}{x \sin x}$

8. $y = x^2 - \dfrac{\pi^2}{4 \sin x}, \sin x \neq 0$
   9. $x = 2y^2 + cy$

10. $x = (\tan^{-1} y - 1) + ce^{-\tan^{-1} y}$

(DAY -10 :- 29/10/2023)
VECTOR ALGEBRA

1. Write a vector of magnitude 15 units in the direction of vector $\hat{i} - 2\hat{j} + 2\hat{k}$.

2. Find $\vec{a} \cdot \vec{b}$ if $\vec{a} = 3\hat{i} - \hat{j} + 2\hat{k}$ and $\vec{b} = 2\hat{i} + 3\hat{j} + 3\hat{k}$.

3. If $\vec{a}$ and $\vec{b}$ are two vectors such that $| \vec{a} \cdot \vec{b} | = | \vec{a} \times \vec{b} |$, then what is the angle between $\vec{a}$ and $\vec{b}$

4. If $|\vec{a}| = 3$, $|\vec{b}| = 5$ and $\vec{a} \cdot \vec{b} = 9$. Find $| \vec{a} \times \vec{b} |$

5. The dot products of a vector with the vectors $\hat{i} - 3\hat{k}$, $\hat{i} - 2\hat{k}$ and $\hat{i} + \hat{j} + 4\hat{k}$ are 0 , 5 and 8 respectively. Find the vector.

6. If $\vec{a} = 2\hat{i} + 2\hat{j} + 3\hat{k}$, $\vec{b} = -\hat{i} + 2\hat{j} + \hat{k}$ and $\vec{c} = 3\hat{i} + \hat{j}$ are such that $\vec{a} + \lambda\vec{b}$ is

   perpendicular to $\vec{c}$, find the value of λ.

7. If $| \vec{a} + \vec{b} | = | \vec{a} - \vec{b} |$, then find the angle between $\vec{a}$ and $\vec{b}$.

8. Let $\vec{a}$, $\vec{b}$, $\vec{c}$ be three vectors such that $\left|\vec{a}\right| = 3, \left|\vec{b}\right| = 4, \left|\vec{c}\right| = 5$ and each of them being perpendicular to the sum of the other two, find $\left|\vec{a} + \vec{b} + \vec{c}\right|$.

9. If with reference to the right handed system of mutually perpendicular unit vectors $\hat{i}$, $\hat{j}$ and $\hat{k}$, $\vec{a} = 3\hat{i} - \hat{j}$, $\vec{\beta} = 2\hat{i} + \hat{j} - 3\hat{k}$ then express $\vec{\beta}$ in the form of $\vec{\beta}_1 + \vec{\beta}_2$, where $\vec{\beta}_1$ is parallel to $\vec{a}$ and $\vec{\beta}_2$ is perpendicular to $\vec{\alpha}$.

10. If $\vec{a} = 4\hat{i} + 5\hat{j} - \widehat{k}$, $\vec{b} = \hat{i} - 4\hat{j} + 4\widehat{k}$, $\vec{c} = 3\hat{i} + 4\hat{j} - \widehat{k}$, then find a vector $\vec{d}$ perpendicular to both $\vec{c}$ and $\vec{b}$ and $\vec{d} \cdot \vec{a} = 21$

ANSWERS

1 $5(\hat{i} - 2\hat{j} + 2\hat{k}$

2. $\vec{a}\vec{a} \cdot \vec{b}\vec{b} = 9$ 3. $\dfrac{\pi}{4}$ 4. 12

5. $15\hat{i}\hat{i} + 5\hat{j}\hat{j} - 3\hat{k}\hat{k}$ 6. 8   7. $\dfrac{\pi}{2}$ 8. $5\sqrt{2}$

9. $\vec{\beta}_1 = \frac{1}{2}(3\hat{i} - \hat{j})$, $\vec{\beta} = \frac{1}{2}\hat{i} + \frac{3}{2}\hat{j} - 3\hat{k}$ 10 $-\frac{1}{3}(\hat{i} - 16\hat{j} - 13\hat{k})$.

CLASS : XII

SESSION: 2023-24

CBSE SAMPLE QUESTION PAPER

SUBJECT: PHYSICS (THEORY)

Maximum Marks: 70   **Time Allowed**: 3 hours.

General Instructions:

(1) There are 33 questions in all. All questions are compulsory.
(2) This question paper has five sections: Section A, Section B, Section C, Section D and Section E.
(3) All the sections are compulsory.
(4) **Section A** contains sixteen questions, twelve MCQ and four Assertion Reasoning based of 1 mark each, **Section B** contains five questions of two marks each, **Section C** contains seven questions of three marks each, **Section D** contains two case study based questions of four marks each and **Section E** contains three long answer questions of five marks each.
(5) There is no overall choice. However, an internal choice has been provided in one question in Section B, one question in Section C, one question in each CBQ in Section D and all three questions in Section E. You have to attempt only one of the choices in such questions.
(6) Use of calculators is not allowed.
(7) You may use the following values of physical constants where ever necessary
    i. $c = 3 \times 10^8$ m/s
    ii. $m_e = 9.1 \times 10^{-31}$ kg
    iii. $e = 1.6 \times 10^{-19}$ C
    iv. $\mu_0 = 4\pi \times 10^{-7}$ TmA^{-1}
    v. $h = 6.63 \times 10^{-34}$ Js
    vi. $\varepsilon_0 = 8.854 \times 10^{-12}$ $C^2 N^{-1} m^{-2}$
    vii.   Avogadro's number $= 6.023 \times 10^{23}$ per gram mole

SECTION-A

1.   Which of the following is not the property of an equipotential surface?
    (a) They do not cross each other.
    (b) The work done in carrying a charge from one point to another on an equipotential surface is zero.
    (c) For a uniform electric field, they are concentric spheres.
    (d) They can be imaginary spheres.

2.   An electric dipole placed in an electric field of intensity 2×10^5 N/C at an angle of 30° experiences a torque equal to 4 Nm. The charge on the dipole of dipole length 2 cm is
    (a) 7 µC   (b) 8 mC   (c) 2 mC   (d) 5 mC

3. A metallic plate exposed to white light emits electrons. For which of the following colours of light, the stopping potential will be maximum?

 (a) Blue   (b) Yellow   (c) Red   (d) Violet

4. When alpha particles are sent through a thin gold foil, most of them go straight through the foil, because

(a) alpha particles are positively charged

(b) the mass of an alpha particle is more than the mass of an electron

(c) most of the part of an atom is empty space

(d) alpha particles move with high velocity

5. An electron is moving along positive x-axis in a magnetic field which is parallel to the positive y-axis. In what direction will the magnetic force be acting on the electron?

 (a) Along -x axis   (b) Along -z axis

 (c) Along +z axis   (d) Along -y axis

6. The relative permeability of a substance X is slightly less than unity and that of substance Y is slightly more than unity, then

(a) X is paramagnetic and Y is ferromagnetic

(b) X is diamagnetic and Y is ferromagnetic

(c) X and Y both are paramagnetic

(d) X is diamagnetic and Y is paramagnetic

7. An ammeter of resistance 0.81 ohm reads up to 1 A. The value of the

required shunt to increase the range to 10 A is

(a) 0.9 ohm   (b) 0.09 ohm   (c) 0.03 ohm   (d) 0.3 ohm

8. An electron with angular momentum L moving around the nucleus has a

magnetic moment given by

(a) $e L/2m$ (b) $e L/3m$ (c) $e L/4m$ (d) $e L/m$

9. The large scale transmission of electrical energy over long distances is done with the use of transformers. The voltage output of the generator is stepped-up because of

(a) reduction of current   (b) reduction of current and voltage both

(c) power loss is cut down   (d) a and c both

10. The diagram below shows the electric field (**E**) and magnetic field (**B**) components of an electromagnetic wave at a certain time and location.

$\vec{B}$

$\vec{E}$
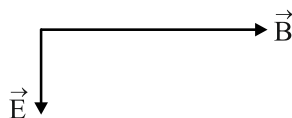
The direction of the propagation of the electromagnetic wave is

(a)   perpendicular to **E** and **B** and out of plane of the paper

(b)   perpendicular to **E** and **B** and into the plane of the paper

(c)   parallel and in the same direction as **E**

(d)   parallel and in the same direction as **B**

11.   In a coil of resistance 100 Ω a current is induced by changing the magnetic flux through it. The variation of current with time is as shown in the figure. The magnitude of change in flux through coil is

10A

I

t →   0.5 s
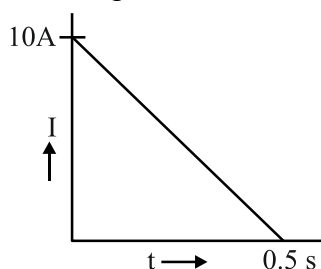
(a)   200 Wb   (b) 275 Wb   (c) 225 Wb   (d) 250 Wb

12.   The energy of an electron in nth orbit of hydrogen atom is $E_n = -13.6/n^2\, eV$. The negative sign of energy indicates that

(a) electron is free to move.

(b) electron is bound to the nucleus.

(c) kinetic energy of electron is equal to potential energy of electron.

(d) atom is radiating energy.

For Questions 13 to 16, two statements are given –one labelled Assertion (A) and other labelled Reason (R). Select the correct answer to these questions from the options as given below.

a)   **If both Assertion and Reason are true and Reason is correct explanation of Assertion.**

b)   **If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.**

c)   **If Assertion is true but Reason is false.**

d)   **If both Assertion and Reason are false.**

13.   **Assertion** (A): For the radiation of a frequency greater than the threshold frequency, photoelectric current is proportional to the intensity of the radiation.

   Reason (R) : Greater the number of energy quanta available, greater is the number of electrons absorbing the energy quanta and greater is number of electrons coming out of the metal.

14.   **Assertion (A)** : Putting p type semiconductor slab directly in physical contact with n type semiconductor slab cannot form the pn junction.

   Reason (R) : The roughness at contact will be much more than inter atomic crystal spacing and continuous flow of charge carriers is not possible.

15. **Assertion (A) :** An electron has a higher potential energy when it is at a location associated with a negative value of potential and has a lower potential energy when at a location associated with a positive potential.

Reason (R) : Electrons move from a region of higher potential to a region of lower potential.

16. **Assertion (A) :** Propagation of light through an optical fibre is due to total internal reflection taking place at the core-cladding interface.

Reason (R): Refractive index of the material of the cladding of the optical fibre is greater than that of the core.

SECTION-B

17. (a) Name the device which utilizes unilateral action of a pn diode to convert ac into dc.

(b) Draw the circuit diagram of full wave rectifier.

18. The wavelength λ of a photon and the de Broglie wavelength of an electron of mass m have the same value. Show that the energy of the photon is 2λmc/h times the kinetic energy of the electron, where c and h have their usual meanings.

19. A ray of monochromatic light passes through an equilateral glass prism in such a way that the angle of incidence is equal to the angle of emergence and each of these angles is 3/4 times the angle of the prism. Determine the angle of deviation and the refractive index of the glass prism.

20. A heating element using nichrome connected to a 230 V supply draws an initial current of 3.2 A which settles after a few seconds to a steady value of 2.8 A. What is the steady temperature of the heating element if the room temperature is 27.0 °C and the temperature coefficient of resistance of nichrome is 1.70×10^{-4} °C^{-1} ?

21. Show that the least possible distance between an object and its real image in a convex lens is 4f, where f is the focal length of the lens.

OR

In an astronomical telescope in normal adjustment a straight black line of length L is drawn on the objective lens. The eyepiece forms a real image of this line whose length is l. What is the angular magnification of the telescope?

SECTION-C

22. A given coin has a mass of 3.0 g. Calculate the nuclear energy that would be required to separate all the neutrons and protons from each other. For simplicity assume that the coin is entirely made of $^{63}_{29}Cu$ atoms (of mass 62.92960 u).

Given m_p = 1.007825u and m_n = 1.008665u.

OR

Draw the graph showing the variation of binding energy per nucleon with mass number. Write two inferences which can be drawn from this graph.

23. Charges (+*q*) and (−*q*) are placed at the points A and B respectively which are a distance 2L apart. C is the midpoint between A and B. What is the work done in moving a charge +Q along the semicircle CRD.
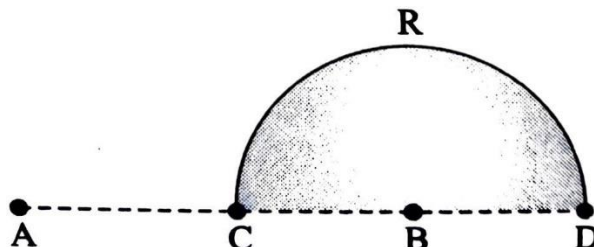

24. The total energy of an electron in the first excited state of the hydrogen atom is about −3.4 eV.
a. What is the kinetic energy of the electron in this state?
b. What is the potential energy of the electron in this state?
c. Which of the answers above would change if the choice of the zero of potential energy is changed?

25. A wire of uniform cross-section and resistance 4 ohm is bent in the shape of square ABCD. Point A is connected to a point P on DC by a wire AP of resistance 1 ohm. When a potential difference is applied between A and C, the points B and P are seen to be at the same potential. What is the resistance of the part DP?
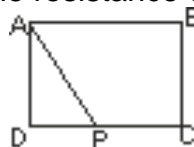
26. The given figure shows a long straight wire of a circular cross-section (radius *a*) carrying steady current *I*. The current *I* is uniformly distributed across this cross-section. Calculate the magnetic field in the region $r < a$ and $r > a$.
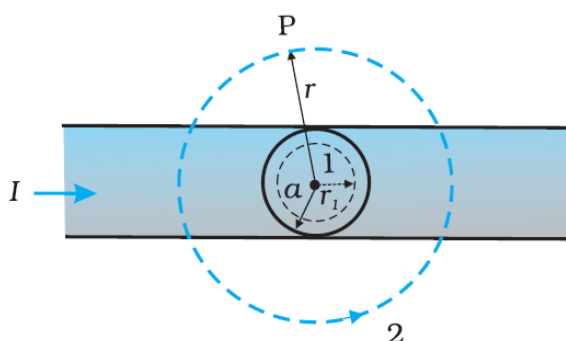
27. Identify the part of the electromagnetic spectrum which:
a)   produces heating effect,
b)   is absorbed by the ozone layer in the atmosphere,
c)   is used for studying crystal structure.

Write any one method of the production of each of the above radiations.

28. a. Define mutual inductance and write its SI unit.
   b. Two circular loops, one of small radius r and other of larger radius R, such that R >> r, are placed coaxially with centres coinciding. Obtain the mutual inductance of the arrangement.

OR

Two long straight parallel current carrying conductors are kept 'a' distant apart in air. The direction of current in both the conductors is same. Find the magnitude of force per unit length and direction of the force between them. Hence define one ampere.

SECTION-D

Case Study Based Questions

29. **Read the following paragraph and answer the questions that follow.**

A semiconductor diode is basically a pn junction with metallic contacts provided at the ends for the application of an external voltage. It is a two terminal device. When an external voltage is applied across a semiconductor diode such that p-side is connected to the positive terminal of the battery and n-side to the negative terminal, it is said to be forward biased. When an external voltage is applied across the diode such that n-side is positive and p-side is negative, it is said to be reverse biased. An ideal diode is one whose resistance in forward biasing is zero and the resistance is infinite in reverse biasing. When the diode is forward biased, it is found that beyond forward voltage called knee voltage, the conductivity is very high. When the biasing voltage is more than the knee voltage the potential barrier is overcome and the current increases rapidly with increase in forward voltage. When the diode is reverse biased, the reverse bias voltage produces a very small current about a few microamperes which almost remains constant with bias. This small current is reverse saturation current.

i. In the given figure, a diode D is connected to an external resistance $R = 100\ \Omega$ and an emf of 3.5 V. If the barrier potential developed across the diode is 0.5 V, the current in the circuit will be:
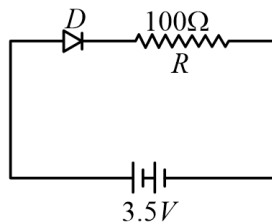
   (a) 40 mA   (b) 20 mA   (c) 35 mA   (d) 30 mA

ii. In which of the following figures, the pn diode is reverse biased?
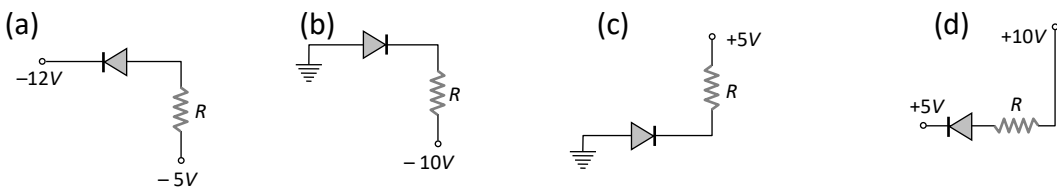
iii. Based on the V-I characteristics of the diode, we can classify diode as
(a) bilateral device   (b) ohmic device
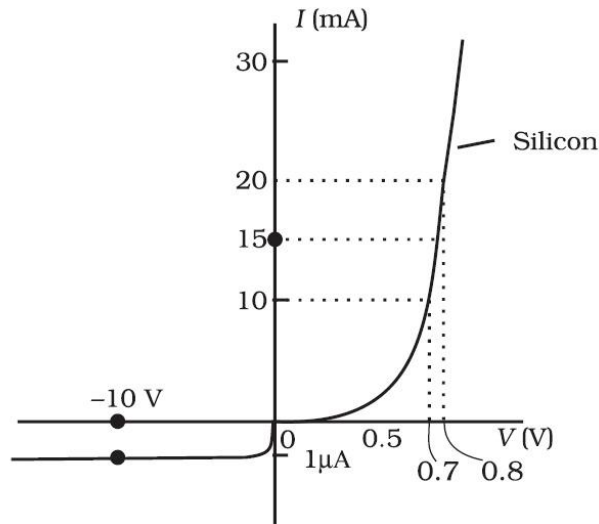(c) non-ohmic device   (d) passive element

OR

Two identical *PN* junctions can be connected in series by three different methods as shown in the figure. If the potential difference in the junctions is the same, then the correct connections will be
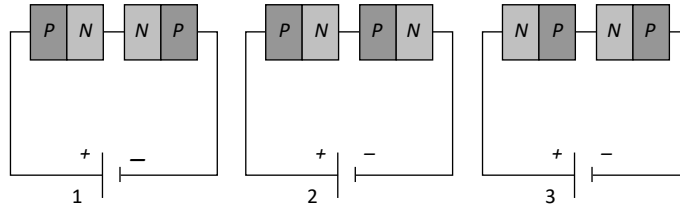
(a) in the circuits (1) and (2)

(b) in the circuits (2) and (3)

(c) in the circuits (1) and (3)

(d) only in the circuit (1)

iv.

The V-I characteristic of a diode is shown in the figure. The ratio of the resistance of the diode at I = 15 mA to the resistance at V = -10 V is

(a) 100   (b) 10^6 (c) 10   (d) 10^{-6}

30. **Read the following paragraph and answer the questions that follow.**

Types of Lenses and their combination

A convex or converging lens is thicker at the centre than at the edges. It converges a beam of light on refraction through it. It has a real focus. Convex lens is of three types: Double convex lens, Plano convex lens and Concavo-convex lens.

Concave lens is thinner at the centre than at the edges. It diverges a beam of light on refraction through it. It has a virtual focus. Concave lenses are of three types: Double concave lens, Plano concave lens and Convexo-concave lens.

When two thin lenses of focal lengths f_1 and f_2 are placed in contact with each other along their common principal axis, then the two lens system is regarded as a single lens of focal length f and

$$\frac{1}{f} = \frac{1}{f_1} + \frac{1}{f_2}$$

If several thin lenses of focal length f_1, f_2, ... f_n are placed in contact, then the effective focal length of the combination is given by

$$\frac{1}{f} = \frac{1}{f_1} + \frac{1}{f_2} + ... + \frac{1}{f_n}$$

and in terms of power, we can write

$$P = P_1 + P_2 + ... + P_n$$

The value of focal length and power of a lens must be used with proper sign consideration.

i. Two thin lenses are kept coaxially in contact with each other and the focal length of the combination is 80 cm. If the focal length of one lens is 20 cm, the focal length of the other would be
(a) -26.7cm (b) 60cm (c) 80cm (d) 30cm

ii. A spherical air bubble is embedded in a piece of glass. For a ray of light passing through the bubble, it behaves like a
(a) converging lens
(b) diverging lens
(c) mirror
(d) thin plane sheet of glass

iii. Lens generally used in magnifying glass is
(a) single concave lens
(b) single convex lens
(c) combination of convex lens of lower power and concave lens of lower focal length
(d) Planoconcave lens

iv. The magnification of an image by a convex lens is positive only when the object is placed
(a) at its focus F
(b) between F and 2F
(c) at 2F
(d) between F and optical centre

OR

A convex lens of 20 cm focal length forms a real image which is three times magnified. The distance of the object from the lens is
(a) 13.33 cm (b) 14 cm (c) 26.66 cm (d) 25 cm

31. i. Draw a ray diagram for the formation of image of a point object by a thin double convex lens having radii of curvature R_1 and R_2. Hence derive lens maker's formula.

ii A converging lens has a focal length of 10 cm in air. It is made of a material of refractive index 1.6. If it is immersed in a liquid of refractive index 1.3, find its new focal length.

OR

i. Define a wavefront. How is it different from a ray?

ii. Using Huygens's construction of secondary wavelets draw a diagram showing the passage of a plane wavefront from a denser to a rarer medium. Using it verify Snell's law.

iii. In a double slit experiment using light of wavelength 600nm and the angular width of the fringe formed on a distant screen is 0.1°. Find the spacing between the two slits.

iv. Write two differences between interference pattern and diffraction pattern.

32. i. Derive an expression for the capacitance of a parallel plate capacitor with air present between the two plates.

ii. Obtain the equivalent capacitance of the network shown in figure. For a 300 V supply, determine the charge on each capacitor.
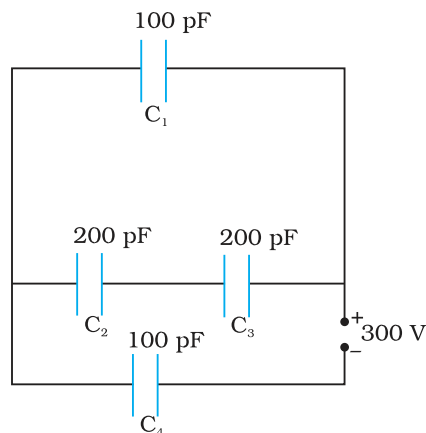
OR

i. A dielectric slab of thickness 't' is kept between the plates of a parallel plate capacitor with plate separation 'd' ($t < d$). Derive the expression for the capacitance of the capacitor.

ii. A capacitor of capacity C_1 is charged to the potential of V_o. On disconnecting with the battery, it is connected with an uncharged capacitor of capacity C_2 as shown in the adjoining figure. Find the ratio of energies before and after the connection of switch S.
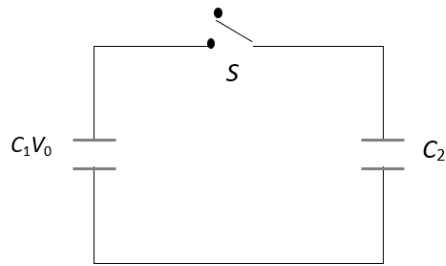
33.a. Draw graphs showing the variations of inductive reactance and capacitive reactance with frequency of applied ac source.

b. Draw the phasor diagram for a series LRC circuit connected to an AC source.

c. When an alternating voltage of 220V is applied across a device X, a current of 0.25A flows which lags behind the applied voltage in phase by $\pi/2$ radian. If the same voltage is applied across another device Y, the same current flows but now it is in phase with the applied voltage.
(i) Name the devices X and Y.
(ii) Calculate the current flowing in the circuit when the same voltage is applied across the series combination of X and Y.

OR

a. A series LCR circuit is connected to an ac source. Using the phasor diagram, derive the expression for the impedance of the circuit.

b. Plot a graph to show the variation of current with frequency of the ac source , explaining the nature of its variation for two different resistances R_1 and R_2 ($R_1 < R_2$) at resonance.

KENDRIYA VIDYALAYA SANGATHAN [RANCHI REGION]
HALF – YEARLY EXAMINATION (2023-24)

Class- XI   Sub.- Physics Theory (042)

Max. Marks- 70   Time- 3 Hrs.

General Instructions:
(1) There are 33 questions in all. All questions are compulsory.
(2) This question paper has five sections: All the sections are compulsory.
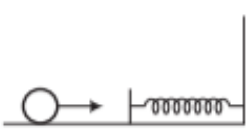*(3) Section A contains 12 MCQ and 4 assertion reasoning questions of 1 mark each, Section B contains five questions of two marks each, Section C contains seven questions of three marks each, and Section D contains two case study based questions of 4 marks each and section E contains three long questions of five marks each .*
(4) There is no overall choice. However, an internal choice has been provided in section B, C, D and E. You have to attempt only one of the choices in such questions.
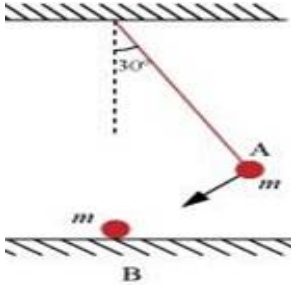*(5) Use of calculators is not allowed.*

Section A

1	Which one of the following is a fundamental physical quantity (a) Luminous Intensity (b) Impulse (c) Energy (d) Force	1
2.	Which of the following physical quantity has the dimensions of $[ML^2T^{-3}]$? (a) work (b) power (c) pressure (d) impulse	1
3	An object is thrown vertically upward then which of these statements is correct. (a) Acceleration and the velocity both are in upward direction. (b) Acceleration is in upward direction and velocity is in downward direction. (c) Acceleration and the velocity both are in downward direction. (d) Acceleration is in downward direction and velocity is in upward direction.	1
4	If a_c and **v** be centripetal acceleration and tangential velocity respectively in uniform circular motion then the angle between a_c and **v** will be (a) 0 ° (b) 180 ° (c) 90 ° (d) 270 °	1
5	A bullet (1) is dropped from the cliff when another bullet (2) is fired horizontally from same cliff. They will hit the ground a) Simultaneously b) Depends on the observer c) bullet 1 first d) bullet 2 first	1
6	A force vector, applied on a mass is represented as $\vec{F} = (8\hat{\imath} - 10\hat{\jmath} + 6\hat{k})$ and accelerates with 1 m/s². What will be the mass of the body? (a) 2√(10)kg (b) 10√2kg (c) 10 kg (d) 20 kg	1

7	A mass of 0.5 kg moving with a speed of 1.5 ms^{-1} on a horizontal smooth surface, collides with a nearly weightless spring of spring constant k =50Nm^{-1}. The maximum compression of the spring would be (a) 0.15 m (b) 0.12 m (c) 1.5 (d) 0.5 m	1
8	A particle of mass m moving with velocity v collides with another particle at rest of equal mass. The velocity of first particle after the elastic collision is (a) 2v (b) v (c) – v (d) 0	1
9	If mass of the body is also varying then which of the following will be the correct formulation for the second law of motion? a) F = m(dx/dt) b) F = ma c) F = v(dm/dt) + ma d) F = mv^2	1
10	The SI unit of Angular Momentum is: (a) Nm (b) kg m^2/s (c) kg m s^{-1} (d) kg m s^{-2}	1
11	A disc having a child is rotating with an angular velocity of ω. If child starts moving on it, which of the following should be conserved? (a) kinetic energy (b) potential energy (c) linear momentum (d) angular momentum	1
12	Which of the following is a self adjusting force? (a) Limiting friction (b) Dynamic friction (c) Sliding friction (d) Static friction	1
	In questions 16 to 18 two statements are given-one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below. *a) Both A and R are true and R is the correct explanation of A* *b) Both A and R are true and R is NOT the correct explanation of A* *c) A is true but R is false* *d) A is false but R is true.*	
13	**Assertion :** On a rainy day, it is difficult to drive a car or bus at high speed. **Reason :** The value of coefficient of friction is lowered due to wetting of the surface.	1
14	**Assertion :** A force applied on the body always does work on the body. **Reason :** If a force applied on a body displaces the body along the direction of force work done will be maximum.	1
15	**ASSERTION**: At highest point of a projectile, dot product of velocity and acceleration is zero. **REASON:** At highest point of projectile, velocity and acceleration are mutually perpendicular.	1

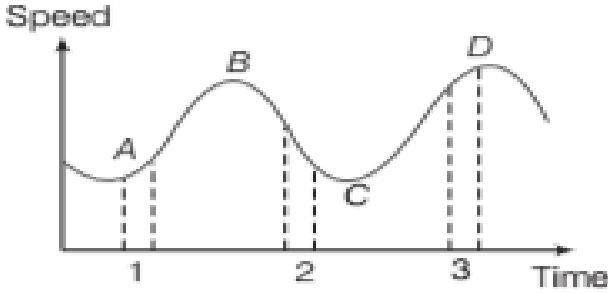| 16 | **ASSERTION**: The whole mass of any body can be supposed to be at the centre of mass of the body.
REASON: Centre of mass and centre of gravity of anybody represents the same point. | |

Section B [2x5=10]

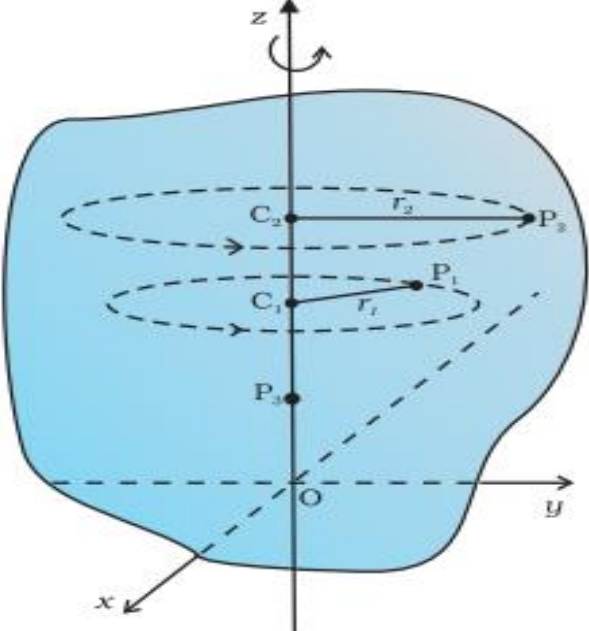| 17	The rotational kinetic energy of a body is given by $E = \left(\frac{1}{2}\right) I\omega^2$ where ω is the angular velocity and I is the moment of inertia of the body. Use the equation to obtain dimensional formula for moment of inertia I.	2
18	The velocity of a particle is given by the equation, $v = 3t^2 + 5t + 3$. Find the average acceleration during the time interval between $t_1 = 2$ s and $t_2 = 4$ sec .	2
19	The bob A of a pendulum released from 30° to the vertical hits another bob B of the same mass at rest on a table as shown in Fig. How high does the bob A rise after the collision? Neglect the size of the bobs and assume the collision to be elastic. Explain your answer. 	2
20	A person of mass 90 kg stands on a weighing scale on a lift. If the lift is (a) descending downwards with constant velocity of 2 m/s (b) moving upward with constant velocity of 2m/s. what would be the readings of the weighing scale? (Take g=10m/s²)	2
21	A person is standing on a rotating table with metal spheres in his hands. If he withdraws his hands to his chest, what will be the effect on his angular velocity and why? OR Two point masses of 1 kg and 2 kg lies at (1,2) , (0,-1). Find coordinates of the Centre of mass.	2

Section -C [3x7=21]

22	The orbital velocity ' v' of a satellite may depend on its mass' m', distance ' r' from the centre of earth and acceleration due to gravity 'g'. Using dimensional analysis obtain an expression for its orbital velocity.	3
23	Plot graph between velocity and time for uniformly accelerated motion and Derive the relation s = ut+1/2 at² (Symbols have usual meaning).	3
24	a) Briefly explain static friction, limiting friction and kinetic friction. Show the variation of friction force with applied force by a graph. b) A body of mass 2 kg is being dragged with a uniform velocity of 2 ms⁻¹ on a rough horizontal plane. The magnitude of friction between the body and the surface is 4 N .Calculate the amount of force required to pull the object.	2+1

25	a) Show that potential energy of spring system with spring constant k and displacement x from mean position is given by ½ k x². b) Show graphically the variation of potential, kinetic and mechanical energy with displacement from mean position.	2+1
26	(a) Write the relation between torque and angular acceleration of a body rotating about a fixed axis of rotation and constant angular acceleration. (b) A fly wheel (in the shape of ring) of mass 0.2 kg and radius 10 cm is rotating with $5/\pi$ rev/s about an axis perpendicular to its plane passing through its centre. Calculate the angular momentum and kinetic energy of the flywheel.	1+2
27	Define Torque and Angular momentum. Derive relation between torque and angular momentum. Or (i) State the law of conservation of angular momentum. (ii) A ring of diameter 0.4 m of mass 10 kg is rotating about its axis at the rate of 2100 rpm [rotation per minute]. Find the (a) moment of inertia about an axis passing through the centre and perpendicular to the plane and (b) angular momentum	3
28	(a) Write down the dimensional formula of following quantity (i) Surface tension (ii) Young's modulus (iii) Gravitational Constant (iv) Impulse (b)Solve 3.84+ 0.0239 - 0.568 and express result to appropriate number of significant figure	2+1

<div align="center">

Section D [CASE STUDY QUESTIONS]   2X4=8

</div>

| 29 | <div align="center">**SPEED TIME GRAPH**</div> Equations are great for describing idealized situations. Sometimes you need a picture to show what's going on — a mathematical picture called a graph. Graphs are often the best way to convey descriptions of real world events in a compact form. Graphs of motion come in several types depending on which of the kinematic quantities (time, position, velocity, acceleration) are assigned to which axis.
 Figure gives a speed-time graph of a particle in one-dimensional motion. Three different equal intervals of time are shown.

 Answer following questions from given figure
 (i) Which physical quantity we get from slope of v - t   graph?
 (ii) In which interval is the average acceleration greatest in magnitude?
 (iii) Give the sign of speed and acceleration in all three intervals
<div align="center">OR</div> | 1+1+2 |

	When a particle is thrown vertically upward with a velocity 100m/s, what is the direction of velocity and acceleration during its upward motion? Also find the final velocity of the body just before touching the ground.		
30	<u>ROTATION OF BODIES</u> In pure rotational motion, every particle of the rigid body moves in circles of different radii about a fixed line, which is known as axis of rotation. Rotation of ceiling fan, opening and closing of doors and rotation of needles of a wall clock etc. come in this category. a) What do you mean by a rigid body? b) What type of motion does a spinning top possess? c) From the given figure, compare linear velocities of particle P_1, P_2. Give reason. OR What is the relation between linear acceleration and angular acceleration of a body? What causes angular acceleration?	1+1+2

SECTION ;E [LONG ANSWER TYPE QUESTIONS]   5X3=15

31	a) A projectile is projected with velocity u and projection angle Θ with horizontal direction. find: i) Time of Flight ii) Horizontal range b) A hiker stands on the edge of a cliff 500 m above the ground and throws a stone horizontally with an initial speed of 15 m/s. Neglecting air resistance, find the time taken by the stone to reach the ground and the speed with which it hits the ground . Consider g = 10 m/s$^{2.}$ OR a) Derive an expression for centripetal force of an object in uniform circular motion in a plane. What will be the direction between velocity and acceleration at any instant. b) A stone tied to the end of a string 100 cm long is whirled in a horizontal circle with a constant speed. If the stone makes 14 revolutions in 22 s, what is the magnitude and type of acceleration of the stone?	3+2 3+2
32	By drawing proper free body diagram of the system a) Derive an expression for maximum velocity with which a car can turn on a circular road of radius R and coefficient of friction μ? b) Explain why does a cyclist bend toward the centre of the road while taking a circular turn. OR a) Why it is easier to pull a lawn mover than to push it. Explain by drawing necessary free body diagram. b) A block of wood of mass m is resting on surface of a rough inclined surface, inclined at an angle Θ as shown in figure: Identify the forces 1,2,3,4	3+2 3+2

33	A man of mass 70 kg stands on a weighing scale in a lift which is moving
	(a) upwards with a uniform speed of 10 m/s ,
	(b) downwards with a uniform acceleration of 5 m/s^2 ,
	(c) Upwards with a uniform acceleration of 5 m/s^2.
	        What would be the readings on the scale in each case?
	(d) What would be the reading if the lift mechanism failed and it falls down freely under gravity?
	                Or
	What do you mean by elastic collision? Derive an expression for final velocities of colliding bodies after one dimensional head on elastic collision.
		5

***

KENDRIYA VIDYALAYA TATANAGAR
AUTUMN BREAK HOLIDAY HOME WORK
2023-24

CLASS- XI B/C
MATHS

- SOLVE ALL THE CASE STUDY QUESTIONS FROM THE STUDY MATERIAL PROVIDED OF CHAPTERS 1 TO 8.
- MAKE SEPARATE FILE OF THIS HOLIDAY HOME WORK.

CLASS-XIIA
MATHS

- SOLVE ALL THE MCQ , ASSERTION REASIONING QUESTIONS AND CASE STUDY QUESTIONS FROM THE STUDY MATERIAL PROVIDED.
- MAKE SEPARATE FILE OF THIS HOLIDAY HOME WORK.

CLASS- VIIIA
MATHS

- SOLVE HALF YEARLY QUESTION PAPER IN YOUR CW COPY.
- WRITE THE SQUARES OF NUMBERS 1 TO 99.
- WRITE THE CUBES OF NUMBERS 1 TO 99.

CLASS- VIIB
MATHS

- SOLVE HALF YEARLY QUESTION PAPER IN YOUR CW COPY.
- WRITE THE SQUARES OF NUMBERS 1 TO 99.
- WRITE THE CUBES OF NUMBERS 1 TO 99.

Teachers sign 19/10/23.
Sourabh Anthoney Lakra.

Principal sign.

SOCIAL SCIENCE   2023-2024

Autumn Break Holiday Homework
Class - VI A

1. Read one chapter everyday.
2. Practice Map Work daily, identifying states and their capitals of India.

3. On the Topic — "CITIZENS AWARENESS"
(i) Write a paragraph on the topic
(ii) Make some Posters, painting
(iii) Write slogans. on the topic.

4. Write any 20 General knowledge questions and its answers.

5. Collect pictures of plains, plateaus, mountains islands etc and paste them in your Subject Enrichment copy or Scrap Book.

Class - VII A

1. Draw the diagrams of three types of rainfall.
2. Describe all about the layers of atmosphere.
3. On the world map locate and label the following :—
(i) All the Oceans of the world (five)
(ii) Seas — Cassibean Sea, Black sea, Red sea, Meditersanean sea, Caspian sea, Arabian sea, China sea, Japan sea.

4. How campaigning been used as tool by women movement?

5. What is the role of festivals in Indian economy? Write your views in context of Durga Puja.

—— x ——

Sub Tr — Mrs. Rina Rani Sijui ; TGT (soc. Sc.)

शरदकालीन गृह कार्य

कक्षा 11वीं

विषय हिन्दी

1. अब तक पढ़ाए गए पाठों (गद्य एवं पद्य)के प्रश्नोत्तर लिखें।

2. किसी समाचार पत्र के सम्पादक को किसी भी विषय पर एक पत्र लिखें।

3. निम्नलिखित में से किसी एक विषय पर एक अनुच्छेद लिखें:

(क) विद्यालय के प्रति हमारा नैतिक कर्त्तव्य

(ख) अपने आस पास के वातावरण को स्वच्छ रखने के लिए आप क्या कर सकते हैं!

(ग)इंटरनेट के लाभ हानि पर प्रकाश डालें।
///

शरदकालीन गृह कार्य

कक्षा 12 विषय हिन्दी

(क)निम्नलिखित पाठों के पाँच पाँच प्रश्न बनाएं और उनके उत्तर लिखें:

1.नए और अप्रत्याशित विषयों पर लेखन

2.कहानी का नाट्य रूपांतरण

3.रेडियो नाटक

(ख) अध्ययन सामग्री में अंकित एक अभ्यास प्रश्न पत्र के उत्तर लिखें।
///

शरदावकाश गृह कार्य

वर्ग - दसवीं

1) उस्ताद बिस्मिल्ला खाँ का जीवनवृत्त एवं संगीत के क्षेत्र में उनके योगदान का वर्णन करते हुए यह बताएँ कि उनके चरित्र से आपने क्या सीखा ?

2) मन्नू भंडारी का जीवन वृत्त एवं उनकी कृतियों
का वर्णन करें और अपने बचपन की किसी रोचक घटना का वर्णन करें ।

3) आप अपनी पुरानी कार बेचना चाहते है। इसके लिए एक आकर्षक विज्ञापन लिखें।

4 आप अपने विद्यालय के संस्कृति सचिव है। सन 2023 में विद्यालय में सर्वोत्कृष्ट प्रदर्शन करने वाले छात्रों को विद्यालय की ओर से बधाई संदेश लिखें।

शरदावकाश गृहकार्य

वर्ग नौवीं

१.) "साँवले सपनों की याद' प्रसिद्ध पक्षी विज्ञानी सालिम अली के पक्षी प्रेम आधारित संस्मरण है। जिसमें सलीम अली की पर्यावरण के प्रति चिंता दिखाई है आप पर्यावरण को बचाने के लिए क्या-क्या कदम उठाएँगे ?

2) हरिशंकर परसाई ने प्रेमचंद का शब्दचित्र खींचा है, उनके जीवनवृत्त, साहित्य में उनके योगदान पर प्रकाश डालें और उनकी कहानियों तथा उपन्यासों की सूची बनाएँ।

3) 'जहाँ चाह वहाँ राह 'तथा 'एकता में बल है' विषय पर लघुकथा लिखें।

4.) आपके विद्यालय में वार्षिक खेल दिवस मनाया
गया। इसकी जानकारी देते हुए स्कूल प्रबंधन समिति के अध्यक्ष को ई- मेल लिखें।

परियोजना कार्य

1) अपने गाँव की सुंदरता एवं वहाँ की विशेषताओं
का वर्णन का संस्मरण शैली में करें। बचपन में आपके द्वारा वहाँ बिताए दिनों की यादों को लिखिए।

2) वाक्य की परिभाषा एवं उनके सभी भेदों के पाँच-पाँच उदाहरण लिखें।

3) पक्षी, बादल,मौसम तथा प्रकृति पर आधारित
कोई दो कविता लिखें।

शरदावकाश गृहकार्य

वर्ग-VII

1) दस विलोम शब्द ,दस पर्यायवाची शब्द औरदस वाक्यांशों के लिए एक शब्द लिखिए ।

2 दस मुहावरे लिखें एवं उनके अर्थ लिखकर वाक्य में प्रयोग करें ।

3.) 'चिड़ियाघर की सैर' पर 120 शब्दों में अनुच्छेद लिखिए।

4.) यक्ष प्रश्न, अज्ञातवास, शांतिदूत श्रीकृष्ण और पांडवों और कोरवों के सेनापति से पाँच-पाँच प्रश्न लिखकर उनके उत्तर लिखें।

5 दुर्गा पूजा की छुट्टियों में जमशेदपुर शहर के दुर्गा पूजा पंडाल घूमने के लिए अपने मित्र को निमंत्रित करते हुए पत्र लिखें।

शरदावकाश गृहकार्य

वर्ग - आठवीं

1) 'सुदामा चरित' कविता का भावार्थ अपने शब्दों में
लिखें।

2) 'युगों का दौर' पाठ से पंद्रह प्रश्न तैयार करें एवं उनके उत्तर लिखिए।

3.) दस -दस उपसर्ग व प्रत्ययों से दो -दो शब्द बनाएँ।

4- दस मुहावरे लिखें एवं उनके अर्थ लिखकर वाक्य में प्रयोग करें ।

5 दुर्गा पूजा की छुट्टियों में जमशेदपुर शहर के दुर्गा पूजा पंडाल घूमने के लिए अपने मित्र को निमंत्रित करते हुए पत्र लिखें

शरदावकाश गृहकार्य

कक्षा-छठी

1)किन्हीं 10 देशों के नाम लिखें और उनमें प्रयोग की जाने वाली मुद्रा के चित्र चिपकाएँ व नाम लिखें ।

2.) विद्यालय में पीने के पानी की उचित व्यवस्था के लिए अपने विद्यालय के प्राचार्य को पत्र लिखें।

3 दुर्गा पूजा की छुट्टियों में जमशेदपुर शहर के दुर्गा पूजा पंडाल घूमने के लिए अपने मित्र को निमंत्रित करते हुए पत्र लिखें

4) सोने का हिरण' और 'सीता की खोज' पाठों से पाँच-पाँच प्रश्न बनाकर उनके उत्तर लिखें।

KENDRIYA VIDYALAYA TATANAGAR

AUTUMN BREAK HOMEWORK

CLASS 6 A

QUESTION 1. Write a letter to your friend inviting him/her to celebrate Durga Puja Holidays with you.

Question 2. Write an article stating the adverse affects of Pollution.

Question 3. Write a page in the diary about your new bicycle.

Question 4. Write a paragraph describing about Durga Puja Celebration in your city. Also state why and how it is celebrated.

Question 5.

15. *Read the stanza given below carefully and answer the questions that follow.*

A habit is a sticky thing, Much good or evil it can bring,
It binds a victim/holds him fast, And keeps him in a vise-like grasp.
Bad habits grow with extra speed, Much like a healthy, growing weed,
The roots grow deep, the stem grows stout, How difficult to pull it out!
Good habits are a little slow, They need a lot of care to grow,
If tended well, they grow more fair, Then any bloom a plant can bear.
Good habits help us all through life, Bad habits bring us pain and strife,
Our habits, whether right or wrong, Each day will grow more firm and strong.

Questions

(i) Suggest a title for this poem.
(ii) What should be the moral of this poem?
(iii) Why are bad habits, bad?
(iv) Roots and stems are associated with

    (a) plants   (b) animals   (c) cars   (d) buildings

(v) Bad habits bring us ....

    (a) pain and strife   (b) health and good luck

    (c) joy and wealth   (d) money and luxury

KENDRIYA VIDYALAYA TATANAGAR

AUTUMN BREAK HOMEWORK

CLASS 7B, 2023-24

QUESTION 1.

13. *Read the passage given below carefully and answer the questions that follow.* [5]

Krishna states in the Bhagwad Gita, 'I am Peepal among trees. As an evolved human spreads divine aura, joy and peace, so do trees. The moment it sprouts from Earth, it spreads its arms-branches-towards the sky to receive all energies, head held high to get connected to universal life force for growth, yet rooted on Earth. It flows with natural forces, making itself stronger, taller and beautiful.

Trees always give just like the rest of nature, teaching and reminding us that giving is the Law of Nature. If we imbibe this, it will make the atmosphere pleasant and congenial for growth. Tree is a guru and reflection of the supreme provider. It is the provider of what is required for our healthy and natural survival. That is why a tree is never ugly; it reflects what it is to be alive, without thrusting and enforcing anything or being a doer. It is alive till the last moment; and even when it perishes, every part of the tree is of great value. There is no human habitat which does not have something made out of a tree or its produce. Trees impart manure to Earth and its roots provide shelter to insects which live underground and nourish the soil.

No matter how much a human plucks its leaves and scratches its bark, the tree never retaliates. It continues to be patient and does its Karma. Trees are a source of livelihood to so many, those who are involved in planting and nurturing of orchards and farm lands, taking care of the creepers fruits and vegetables, transporting and selling them. This inspires us to serve nature, which in turn will enhance the whole environment.

Questions

(i) What do the trees do that is like an evolved human being? [1]

(ii) Why does the author say that a tree is never ugly? [1]

(iii) What are the virtues of trees that you learn from the above passage? [1]

(iv) Which word from the passage means 'bringing up with care'? [1]
   (a) Retaliate   (b) Perish
   (c) Nurture   (d) Enhance

(v) Which word in the passage has the meaning opposite to 'flourish'? [1]
   (a) Perish   (b) Continue
   (c) Alive   (d) Pleasant

Question 2. You have recently been to a railway station to see off some of your relatives. There ypu saw railway coolies rushing on the platform with loads of heavy luggage. You realised how hard they worked to earn. Write an article on 'The Life of a Railway Collie' in about 100-120 words.

Question 3. Write letter to your friend inviting him/her to celebrate Durga Puja Holidays with you.

Question 4. You are Astha, Head Girl of RJ Public School, Kanpur. Write a notice for the notice board of your school informing the students about a debate competition to be held on 1st November, 2023.

Question 5. You have recently enjoyed Delhi Metro Ride with a close associate. The traffic discipline and modern technology impressed you. Write a diary entry to share your experience. You are Geetika.

CLASS: 8

1. Complete the Learner's Diary.
2. Collect the information about Different Industries.
Private sector Industries, Joint Sector Industries, Co-operative sector Industries.
3. Write short notes about the conditions of women in India before the social reforms and after the social reforms and the struggles of women to get education.
4. Make poster on Citizen Awareness on chart paper (size ¼ of chart paper) and write about citizen awareness including fundamental duties.

KENDRIYA VIDYALAYA TATANAGAR, 2023-24

CLASS- 8A

AUTUMN BREAK HOLIDAY HOMEWORK

Passage 4

This is the way that autumn came to the trees,
It stripped them down to the skin,
Left their ebony bodies naked.
It shook out the yellow leaves which were their hearts,
scattered them over the ground.
Whoever wasted, trempled them out of slope, Not a single moan of protest was heard.
Birds that herald dreams
Became strangers to their voice,
When their song was throttled,
They dropped into the dust.
Even before the hunter string his bow.
Oh! God of May, have mercy;
Bless these withered bodies,
With the passion of your resurrection,
Make their dead veins flow with blood.
Give some tree the gift of green again
Let one bird sing.

Questions

1. What kind affect did autumn have on the trees?
2. Why did the birds lose their songs?
3. Explain the meaning of the line. "Give some tree the gift of green again'.
4. Whom does the narrator beg for mercy?
5. Choose a word from the poem that means 'being stranged.'
6. Give an antonym of the word 'Wither'.

Question-2

 One of the two friends is leaving the school in the middle of the semester as his father is getting transferred to another state. Frame a dialogue between the father and the son.

Question-3 Write an article for your school magazine on 'The increasing use of social networking sites' by school children.

Question-4. Write a letter to your friend inviting him/her to celebrate Durga Puja Holidays with you.

Question-5 As the School Captain of your school you have to put up a notice informing all the students about the special screening of the patriotic movie " Mera Bharat" in the School Auditorium on the occasion of Republic Day. Draft a notice informing about the same by giving all the relevant details.

ENGLISH
CLASS - IX
AUTUMN BREAK ASSIGNMENT

1. You are very much disheated on reading about deforestation. A forestation is demand of time. Write a letter to the editor showing concern for a green planet.

2. Complete the following story :~

   It was a beautiful sunrise in the morning over the sea. It reminded me of the heavenly experience that I had watched recently in one of the movies. The sunshine glowed and the reflection on the seawater was awesome. As I gazed suddenly.....

3. Write a brief description on Santosh Yadav OR Maria Sharapova.

4. Read the remaining chapters and enlist the meaning of new words.

5. Do as directed :~

(i) Present the following in reported speech :

   Madhuri : Have you seen the place ? I think it is a wonderful place.
   Anshu : No, I haven't been there. So, I do not know.

   Madhuri enquired .... She thought ....

   Anshu replied negatively .... He had ....

(ii) fill in the gaps :

a. Children ———— complete their work on time.
b. This fan makes lot of noise and ——— run properly.

c. _____ is good for healthy life.

d. It ____ be sunny tomorrow.

e. The earth ____ be the green planet for all living being.

6. Write a page handwriting everyday to improve your handwriting.

SAMPLE QUESTION PAPER (2023-24)

ECONOMICS (030) CLASS XII
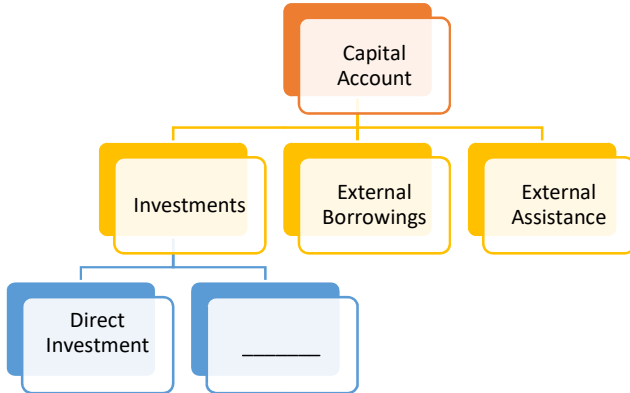
TIME: 3 HOURS   **M.M. – 80**

GENERAL INSTRUCTIONS:

1. This question paper contains two sections:

    Section A – Macro Economics

    Section B – Indian Economic Development

2. This paper contains 20 Multiple Choice Questions of 1 mark each.
3. This paper contains 4 Short Answer Questions of 3 marks each to be answered in 60 to 80 words.
4. This paper contains 6 Short Answer Questions of 4 marks each to be answered in 80 to 100 words.
5. This paper contains 4 Long Answer Questions of 6 marks each to be answered in 100 to 150 words.

Q.NO.	SECTION A – MACRO ECONOMICS	MARKS
1	Read the following statements carefully: **Statement 1:** Consumption function assumes that, consumption changes at a constant rate as income changes. **Statement 2:** Autonomous consumption is the ratio of total consumption (C) to total income (Y). In light of the given statements, choose the correct alternative from the following: a) Statement 1 is true and Statement 2 is false. b) Statement 1 is false and Statement 2 is true. c) Both Statements 1 and 2 are true. d) Both Statements 1 and 2 are false.	1
2	For a closed economy (with no foreign trade), which one of the following is correct? a) GDP = GNP b) GDP > GNP c) GDP < GNP d) GDP + GNP=0	1
3	The value of _____ can be greater than one. (Choose the correct alternative to fill up the blank) a) Marginal Propensity to Consume b) Average Propensity to Consume c) Marginal Propensity to Save d) Average Propensity to Save	1
4	As per the Reserve Bank of India (RBI) press report, dated 29th December, 2022: "Net external commercial borrowings to India recorded an outflow of US$ 0.4 billion in the second quarter (2022-23)" The above transaction will be recorded in the _____ account on _____ side of Balance of payments account of India. (Choose the correct alternative to fill up the blanks) a) current, credit b) current, debit c) capital, credit d) capital, debit	1

| 5 | "The value of all goods and services can be expressed in monetary units."
On the basis of the given statement, identify the function performed by money:
a) Medium of exchange   b) Store of Value
c) Unit of account   d) Means of standard of deferred payments | 1 |

| 6 | Find the missing figures and choose the correct alternative: | 1 |

Round	Deposits	Loans (80%)	Reserve Ratio (20%)
I	1,000	800	200
II	800	….(i)….	160
	..	..	..
	..	..	..
Total	…(ii)…	…(iii)…	…(iv)…

Alternatives:
a) 640,1000,4000,5000   b) 960,5000,4000,1000
c) 640,4000,1000,5000   d) 640,5000,4000,1000

| 7 | Graphically, Aggregate Demand function can be obtained by vertically adding the _____ and _____ function.(Choose the correct alternative to fill up the blanks)
a) consumption, saving
b) consumption, investment
c) investment, saving
d) aggregate supply, consumption | 1 |

| 8 | Identify the correct reason(s) that may affect the demand for foreign exchange in an economy.
   I.   Imports of visibles
  II.   Exports of invisibles
 III.   Remittances by residents working abroad
 IV.   Purchase of assets abroad
Alternatives:
a) I and II   b) II and III
c) III and IV   d) I and IV | 1 |

| 9 | Suppose for a given economy,
  S= -60 + 0.1Y
  I= ₹ 4,000 crore
(Where S = Saving Function, Y = National Income and I = Investment Expenditure)
Equilibrium level of Income would be ₹ _____ crore.

            (Choose the correct alternative to fill up the blank) | |

Alternatives:
  a) 4,000   b) 40,000
  c) 40,600   d) 60,400

1

---

10 | Read the following chart carefully and choose the correct alternative:

Alternatives:
  a) Interest received on loans   b) Multilateral Loans
  c) Portfolio Investment   d) Government Aid

1

---

11 | 'Current account deficit in an economy must be financed by a corresponding capital account surplus'.
Do you agree with the given statement? Give valid reason(s) in support of your answer.

3

---

12 | (A) On the basis of the given data, estimate the value of Domestic Income:

S. No.	Items	Amount (₹in crore)
i.	Household Consumption Expenditure	600
ii.	Gross Fixed Capital Formation	200
iii.	Change in stock	40
iv.	Government Final Consumption Expenditure	200
v.	Net Exports	(-)40
vi.	Net Indirect Taxes	120
vii.	Net Factor Income From Abroad	20
viii.	Consumption of Fixed Capital	40

OR

(B) State the meanings of the following:
  (i) Externalities   (ii) Operating Surplus   (iii)Consumption Goods

3

3

---

13 | For a hypothetical economy, the government incurs an investment expenditure of ₹ 1,000 crore. If the value of Marginal Propensity to Save (MPS) falls from 0.25 to 0.10.
Calculate the value of increase in income due to change in the value of Marginal Propensity to Save (MPS).

4

14	(A) "In an economy, ex-ante Aggregate Demand is more than ex-ante Aggregate Supply." Elaborate the possible impact of the same, on the level of output, income and employment. **OR** (B) "With an objective to reduce inflation, Reserve Bank of India may promote the commercial banks to park their surplus funds with it." Discuss the rationale behind the step taken by the Reserve Bank of India.	4 4
15	Elaborate the 'Banker's Bank and Supervisor' function performed by the Reserve Bank of India.	4

16	(A) On the basis of the given information, calculate the value of: (i) Fiscal deficit (ii) Primary deficit	3 2

S.No.	Items	2021-22 (₹in crore)
(i)	Revenue Receipts	20
(ii)	Capital Expenditure	15
(iii)	Revenue Deficit	10
(iv)	Non-debt creating capital receipts	50% of revenue receipts
(v)	Interest Payments	4

	(B) State any two features of public goods. **OR** (C) Explain the economic stability objective of Government Budget. (D) 'Under the *Ayushmaan Bharat* Scheme, the Government provides free medicines to the economically backward section of the society'. Identify and discuss the nature of the government expenditure indicated in the given statement.	1 3 3
17	(a) Giving valid reasons, explain how the following would be treated while estimating domestic income? (i) Payment made by American tourist for goods purchased in India. (ii) Tomatoes grown by Ms. Puja in her kitchen garden. (b) "Machine purchased by a firm is always a capital good." Do you agree with the given statement? Give valid reasons for your answer.	3 3

SECTION B – INDIAN ECONOMIC DEVELOPMENT

18	Identify the correct combination of the 'Goals of Indian Five Year Plans':
	  a) Growth, Equality, Modernisation, Self-Reliance
	  b) Development, Equality, Modernisation, Sustainability
	  c) Good Health, Education, Modernisation, Sustainability
	  d) Growth, Equity, Modernisation, Self-Reliance
		1

19	'China has performed exceedingly well in various health and economic indicators'. Identify which of the following is not a health indicator? a) Infant Mortality Rate (per 1000 live births) b) Life Expectancy at Birth (years) c) Percentage of people below poverty line (National) d) Maternal Mortality Rate (per 1 lakh births)	1
20	The shackles of agriculture during the colonial rule were permanently broken by the Green Revolution that resulted from the application of ___. (Choose the correct alternative to fill up the blank) I. High Yielding Varieties (HYV) II. Mechanization of Agriculture III. Chemical Fertilizers and Pesticides IV. Organic Fertilizers and Pesticides **Alternatives:** a) I, II, IV b) I, II, III c) II, III, IV d) I, III, IV	1
21	Study the following picture and answer the given question: Women in rural households take up bee-keeping as an entrepreneurial activity. Such kind of activities may be envisaged under _____ as diversification activity. (Choose the correct alternative to fill up the blank) a) Animal husbandry b) Fisheries c) Horticulture d) Poultry	1
22	Read the following statements: Assertion (A) and Reason (R). Choose the correct alternative from those given below. **Assertion (A):** In 1991, as an immediate measure to resolve the Balance of Payments crisis, the rupee was devalued against foreign currencies. **Reason (R):** Devaluation of currency was eminent, to replenish the deteriorated foreign exchange reserves. **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, 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

23	Under _____ in China, farmers and industrial units were required to buy and sell fixed quantities of inputs and outputs on the basis of prices fixed by the government and the rest were purchased and sold at market prices.	
	(Choose the correct alternative to fill up the blank)	
	a) Commune System b) Great Leap Forward	1
	c) Dual Pricing d) Great Proletarian Cultural Revolution	
24	Micro credit programmes play a vital role in ensuring an overall development of the rural economy as they_____.(Choose the correct alternative to fill up the blank)	
	(i) provide financial support	
	(ii) lead to women empowerment	
	(iii) enhance the reach of formal credit system	
	Alternatives:	
	a) (i) and (ii) b) (ii) and (iii)	
	c) (i) and (iii) d) (i), (ii) and (iii)	1
25	_____may be defined as the measure of the extent of demographic participation in the social and political decision making.	
	(Choose the correct alternative to fill up the blank)	
	a) Economic indicator b) Liberty indicator	
	c) Health indicator d) Demographic indicator	1
26	Read the following statements carefully:	
	Statement 1: The nature of unemployment problem in India is uni-faceted.	
	Statement 2: Worker-Population ratio is an indicator used for analysing the employment situation in a country.	
	In light of the given statements, choose the correct alternative from the following:	
	a) Statement 1 is true and Statement 2 is false.	
	b) Statement 1 is false and Statement 2 is true.	
	c) Both Statements 1 and 2 are true.	
	d) Both Statements 1 and 2 are false	1
27	From the set of the events given in column I and corresponding facts given in Column II, choose the correct pair of statements:	

	Column I		Column II
A.	Adoption of mixed economic system	I.	The common development policy of India and China
B.	Introduction of economic reforms in China	II.	Imposed by World Bank
C.	Great Leap Forward Campaign	III.	Focussed on massive industrialization
D.	First Five Year Plan of Pakistan	IV.	Announced in 1953

Alternatives:
a) A-I   b) B-II
c) C-III   d) D-IV

1

28	(A) "During the colonial period, a number of socio-economic indicators were in a dilapidated state."	3
	List any three such indicators that led to the worsening of India's demographic profile.	
	OR	
	(B) "The pre-independent India's occupational structure experienced growing regional variation."	3
	Justify the above statement with valid explanation.	
29	"Ravya was initially working as an office clerk in a firm. In the pursuit to attain, a higher position and income, she attended a few on-the-job training sessions. These sessions contributed positively to her skills and expertise."	
	Explain the impact of Ravya's decision on human capital formation.	3
30	"In the late 1970s, China introduced the One-child policy that led to arrest in the population coupled with skewed sex ratio."	
	Justify the given statement with valid arguments in support of your answer.	4
31	(A) State and elaborate whether the following statements are true or false, with valid arguments:	
	(i) Agricultural marketing is a process that ensures the transportation of various agricultural commodities only.	2
	(ii) *Jan-Dhan Yojana* has been a crucial step for financial resource mobilization in the Indian economy.	2
	OR	
	(B) "Since independence, the government has been playing an important role in generating employment directly or indirectly." Discuss.	4
32		
	Identify the situation depicted in the given image. Suggest the impact of the indicated situation, on the Indian economy.	4
33	(A) Green revolution transformed India from a subsistent food grain economy to a food surplus economy."	
	Justify the statement, giving reasons in support of your answer.	3
	(B) "In order to protect domestic industries, India followed the regime of restrictions on imports."	3

	Briefly outline and discuss such steps taken by the government to promote import substitution policy. **OR** (C) "In India, after 1947 land reforms were introduced on a large scale." In the light of the given statement, discuss any one such land reform. (D) "In the post-reform period, the Government of India decided to retain profit-making Public Sector Undertakings (PSUs). It provided a special status to PSUs to enable them to expand in the global market." Do you agree with the given statement? Give valid reasons in support of your answer.	3 3
34	Read the following text carefully: Sustainable development is the development that meets the needs of the present, without compromising the ability of future generations to meet their own needs. India is critical in determining the success in a pursuit to achieve sustainable development. The Union Budget 2023 presented by Finance Minister Nirmala Sitharaman builds on India's commitment to lead the global action against climate change, preserve biodiversity and support sustainable development. The government has accelerated the pace of Green Growth as India is facing the grave reality of depleting natural resources, limited supply of water, minerals, and fossil fuels. In a bid to counter the climate threat, India has committed to achieving net zero by 2070; released a low-carbon development strategy; and introduced the concept of 'LiFE' (Lifestyle for Environment) to promote responsible consumption. The Green Growth actions include several pointed measures that would facilitate the much-needed steady decarbonization of Indian industries, reduce dependency on fossil fuel imports and establish technology and market leadership in this sunrise sector. For instance: The allocation of Rs 35,000 crore of priority capital investment towards achieving net zero by 2070 and clean energy transition ensures the country's energy security. The outlay of Rs 19,700 crore for the Green Hydrogen Mission will mobilise a green hydrogen production capacity of 5 metric million tonnes by 2030. Moreover, to encourage the optimal use of wetlands, enhance biodiversity, carbon stock, eco-tourism opportunities and income generation for local communities, the Amrit Dharohar scheme will be implemented over three years. Source: https://economictimes.indiatimes.com/industry/renewables/view-budget-2023-ensured-india-is-primed-for-green-growth On the basis of the given text and common understanding, answer the following questions: (i) Define sustainable development. (ii) Briefly elaborate, any two reasons behind the objective of Green Growth being set up by the Indian Government.	 2 4

MARKING SCHEME - SAMPLE QUESTION PAPER (2023-24)
ECONOMICS (030) CLASS XII

Q.NO.	SECTION A – MACRO ECONOMICS	MARKS
1	b) Statement 1 is true and Statement 2 is false.	1
2	a) GDP = GNP	1
3	b) Average Propensity to Consume	1
4	d) capital, debit	1
5	c) Unit of account	1
6	d) 640,5000,4000,1000	1
7	b) consumption, investment	1
8	d) I and IV	1
9	c) 40,600	1
10	c) Portfolio Investment	1
11	Yes, the statement can be agreed upon. Since, in accounting sense; Current Account + Capital Account ≡ 0 If an economy is facing the situation of current account deficit (CAD), the same must be financed through surplus in capital account. CAD may be setoff through net capital inflows. Transactions like selling off assets or borrowing from abroad, may be instrumental in balancing CAD in Balance of Payments account.	3

12	**(A) Domestic Income (NDP at FC) =** (i) + (v) + (ii) + (iii) + (v) – (viii) – (vi)
	                                 = 600 + 200 + 200 + 40 + (-40) – 40 – 120
	                                 = ₹ 840 crore
	OR
	(B)
	(i) Externalities – Externalities refer to benefits (positive externalities)/ harms (negative externalities) which are caused by one entity to another without being paid/ penalised for it.
	(ii) Operating Surplus – Operating Surplus is the sum total of rent, royalties, interest and profits. It is also known as non-wage income.
	(iii) Consumption goods – Goods which are consumed by the ultimate consumers or meet the immediate need of the consumer are called consumption goods. It may include services as well.
		1 ½
		1
		½
		
		1
		
		1
		
		1

13	Given, Change in Investment (ΔI) = ₹ 1,000 crore	

MPS	Investment Multiplier $K = \dfrac{1}{MPS}$	Change in Income (ΔY) $ΔY = K \times ΔI$ (₹ in crore)	
0.25	$\dfrac{1}{0.25} = 4$	4 x 1,000 = 4,000	1 ½
0.10	$\dfrac{1}{0.10} = 10$	10 x 1,000 = 10,000	1 ½

	Increase in Income (ΔY)= 10,000 – 4,000 = ₹ 6,000 crore	1

14	(A) When ex-ante Aggregate Demand is more than ex-ante Aggregate Supply, it means that households are planning to consume more than what the firms expect them to. This will lead to unintended fall in inventories.	4
	To restore the desired /intended level of inventories, producers may expand production. As a result, there may be an increase in the level of output, employment and income in the economy.	
	OR	
	(B) Reverse repo rate is the rate at which commercial banks may park their surplus funds with the Central Bank.	
	In order to decrease inflation in an economy, Reserve Bank of India (RBI) may increase the reverse repo rate. With the increase in reverse repo rate, it becomes lucrative for commercial banks to park surplus funds with the central bank. Consequently, this may lead to reduction in their lending capacity. Thereby, fall in the Aggregate Demand curbs the level of inflation.	4

15	Central bank accepts the deposits from commercialbanks andalsoadvances loans tothemasand when required. It maintains reserves of all commercial banks and utilizes it to settle inter-bank claims.	4
	Being the supreme authority of the banking system, it acts as the financier of last recourse to the commercial banks. It forwards short-term credit to the commercial banks against approved securities.	
	The Central Bank supervises, regulates and controls the commercial banks. The regulation of banks may be related to their licensing, branch expansion, liquidity of assets, management, amalgamation and liquidation.	

16	(A) (i) Fiscal Deficit = (iii) + (ii) – (iv)	1
	= 10 + 15 – (50/100 x 20)	1 ½
	= ₹15 crore	½
	(ii) Primary Deficit = Fiscal Deficit – (v)	1
	= 15 – 4	
	= ₹11 crore	½
	(B) Two features of public goods are:	½
	• Non- excludable	½
	• Non- rivalrous	½

	OR	
	(C) The government may need to correct the fluctuations (income, employment and prices) in the economy. These may depend upon the level of Aggregate Demand, which in turn depends upon the spending decision of households and firms. To stabilize the economy, under the state of inflation/deflation, Government may alter taxes/expenditure, accordingly.	**3**
	(D) Expenditure incurred by the government under Ayushmaan Bharat Scheme for providing free medicines to the economically backward section does not lead to any creation of assets or reduction in liabilities. Hence, it can be classified as revenue expenditure.	**3**
17	(a) (i) Yes, it will be included in domestic income as goods purchased by American tourist is the expenditure made by him in India and will be included as exports.	**3**
	(ii) No, it will not be included in domestic income because it is difficult to ascertain their market value. Moreover, such transactions are not undertaken for any monetary consideration.	
	(b) No. Capital goods are those final goods which help in the production of other goods and services. A machine purchased by a firm will be a capital good when it is used for the production of other goods and services. However, if it is purchased by a firm for resale purposes in the same year, it will be considered as an intermediate good and not a capital good.	**3**
	SECTION B – INDIAN ECONOMIC DEVELOPMENT	
18	d) Growth, Equity, Modernisation, Self-Reliance	**1**
19	c) Percentage of people below poverty line (National)	**1**
20	b) I, II, III	**1**
21	c) Horticulture	**1**
22	a)Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).	**1**
23	c) Dual Pricing	**1**
24	d) (i), (ii) and (iii)	**1**
25	b) Liberty indicator	**1**
26	b) Statement 1 is false and Statement 2 is true.	**1**
27	c) C-III	**1**

28	(A) India's demographic indicators were in a dilapidated state during the colonial period as: ● The overall literacy level was less (below 16%). ● Life expectancy was very low (32 years). ● Alarming infant mortality rate (218/1000). **OR** (B) The pre-independent India's occupational structure experienced growing regional variation as: ● Parts of Madras Presidency, Bombay and Bengal witnessed a decline in the dependence of the workforce on the agricultural sector with a commensurate increase in the manufacturing and the services sectors. ● There had been an increase in the share of workforce in agriculture in states such as Orissa, Rajasthan and Punjab.	**1 X 3** **3**
29	On-the-job trainings have become an integral part of work environment in the recent times as they add to the productive capacity of employees. Firms encourage such trainings, as the benefits outweighs the cost of these trainings. It enables employees to develop skills and adapt modern technologies/ideas. Thus, Ravya's decision to attend on-the-job training sessions will have a positive impact on human capital formation.	**3**
30	China is the most populous country in the world. Its annual population growth rate was very high. The one-child norm introduced in China in the late 1970s is the major reason for fall in the population growth rate. However, this measure led to a decline in the sex ratio. The number of females per 1000 males in China is approximately 949. One-child policy and prevalent son-preference is the prime reason behind the skewed sex ratio.	**4**
31	(A) (i) False. Agricultural marketing is a process that involves the assembling, storage, processing, transportation, packaging, grading and distribution of different agricultural commodities across the country. (ii) True. Jan-Dhan Yojana has promoted thrift habits and efficient allocation of financial resources, particularly in rural areas. Formal banking system has mobilized a substantial amount under this yojana. **OR** Various government departments/enterprises employ people and increase their output of goods and services, leading to direct employment. When the output of goods and services from government enterprises increases, then private enterprises which receive raw materials from government enterprises will also raise their output. Subsequently, private enterprises using these output are indirectly benefitted with increase in scale of production. This leads to an increase in the number of employment opportunities indirectly in the economy.	**2** **2** **4**
32	The given image depicts the drift of the Indian workforce from the formal sector to the informal sector employment. This situation is popularly known as 'informalisation of	**1**

the workforce'.

In India, informal sector includes millions of farmers, agricultural labourers, non-farm casual wage labourers, owners of small enterprises and the self-employed people. The workforce in the informal sector does not get regular income; they do not have any protection or regulation from the government. Workers may be dismissed without any compensation/notice.

The Government is taking steps to safeguard the interests of the workers in the informal sector.

3

33	**(A)** Before the advent of Green Revolution, a large proportion of agricultural produce was consumed by the farmers themselves instead of being sold in the market. Green Revolution led to an increase in the growth of agricultural output.
	After the Green Revolution, a greater proportion of the agro-produce (wheat and rice) was sold by the farmers in the market. That led to the attainment of marketed surplus and converted India into a food surplus economy from the food scarce one.
	
	(B) In order to protect domestic industries, India followed the import substitution policy. This policy aimed at substituting imports with domestic production. The domestic industries were protected from foreign competition by using the following tools:
	    i. Tariffs: Tariffs are a tax on imported goods that make imported goods dearer and discourage their usage.
	    ii. Quotas: Quotas specify the quantity of goods that can be imported.
	<center>**OR**</center>
	(C) Land reforms were inevitable in the post-independence era. The policy makers of independent India introduced land reforms such as land ceiling, abolition of intermediaries etc.
	Land ceiling means fixing up the maximum size of landholding which could be owned by an individual. This step was essential to promote equity in the agricultural sector so as to reduce the concentration of land ownership in a few hands.
	
	(D) Yes. In order to improve efficiency, infuse professionalism and enable Public Sector Undertakings (PSUs) to compete more effectively in the liberalised global environment, the government identified profit making PSUs. Government declared them as Maharatnas, Navratnas and Miniratnas. PSUs were given greater managerial and operational autonomy, in taking various decisions.
	As a result, over the years these Maharatnas, Navratnas and Miniratnas have performed exceedingly well and established themselves as market leaders.
		3
		
		3
		
		3
		
		3

34	(i) Sustainable development is the development that meets the need of the present generation without compromising the ability of the future generations to meet their own needs. (ii) The Indian Government has accelerated the pace of Green Growth as India is: ● Facing the grave reality of depleting natural resources, limited supply of water, minerals, and fossil fuels. This has created a number of environmental issues in the recent past in India.	**2** **2**

	● To counter the climate threat, India has committed to achieve net zero target by the year 2070. This will facilitate much needed decarbonization of Indian industries, reduce dependency on fossil fuel imports and to become a market leader in the sunrise industry.	**2**

1. Explain the central problem of an economy.
2. Show diagrammatically consumer's equilibrium using indifference curve analysis .Also analyses the conditions of consumer's equilibrium.
3. Explain consumer's equilibrium in case of two commodities with the help of diagram .
4. Explain Law of diminishing marginal utility with schedule and diagram.
5. Explain the relationship between Total utility and marginal utility with diagram.
6. Explain the properties of Indifference curve.
7. Write the difference between budget set and budget line.
8. Write the difference between change in demand and change in Quantity demanded.
9. Find out the mode of the following series.

Marks	0-10	10-20	20-30	30-40	40-50	50-60
No of students	5	10	25	15	10	5

10. From the following distribution of monthly income of 60 people in a company, draw a less than and more than ogive curve.

Monthly Income (Rs in 000)	No of people
10-20	6
20-30	9
30-40	10
40-50	15
50-60	12
60-70	8

1. Write the following numbers in the place value table.
   (i)   43.6 (ii) 347.3 (iii)   38.5
2. Write decimals number for each of the following
   (i)   Five and four tenths   (ii)   Thirty four and seven tenths
   (ii)   Five hundreds and twenty six hundredths
3. Represent the following decimals as fractions.
   (i)   0.5 (ii) 7.5   (iii) 25.3
4. Write the numbers given in the following place value in decimals form.

	Hundreds	Tens	Ones	Tenths	Hundredths	Thousandhs
(a)	0	5	4	3	2	0
(b)	1	1	6	0	4	3

5. Which is greater?
   (a) 0.6 or 0.06   (ii)   1.0 or 0.99   (iii) 413.5 or 41.35
6. Convert as rupees using decimals
   (a) 6 paise =   ---------------
   (b) 46 paise =   _____
7. Convert as cm using decimals.

   (i) 15 mm   = _____   cm   (ii)   9cm 2mm _=   ___cm