

Kendriya Vidyalaya Malleshwaram-1
Summer Holiday Homework 2021 For class III (3)

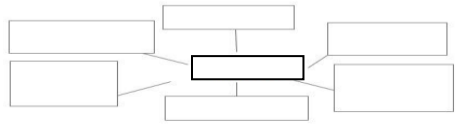
English	Hindi	Maths	EVS
<p>Class-III Subject-English Holidays Homework</p> <p>1) Write 2-3 lines for handwriting daily.</p> <p>2) Collect some information about birds and answer the following questions:</p> <p>(i) Name of the bird:</p> <p>(ii) Colour of the feathers:</p> <p>(iii) Food they eat:</p> <p>(iv) sound they make</p> <p>3) Imagine you have entered a large garden and find many wonderful and beautiful things there. Describe the magic garden in your own words.</p> <p>4) Make sentences from the following words:</p> <p>(i) magic-</p> <p>_____</p> <p>(ii) tiny-</p> <p>_____</p> <p>(iii) awake-</p> <p>_____</p> <p>(iv) feathers-</p> <p>_____</p> <p>5.) Read some good stories.</p>	<p>Summer vacation holiday homework</p> <p>Class: III</p> <p><u>Hindi</u></p> <p>1) किन्ही पाँच कीड़ों के नाम लिखकर उनके चित्र चिपकाओ ।</p> <p>2) शेर के बारे में पाँच वाक्य लिखो।</p> <p>3) सुलेख लिखो ।(पाँच पृष्ठ)</p>	<p>Suggestive Activities for summer holidays 2021-22 (to be guided by Parents), Class- III, Sub- Mathematics</p> <ul style="list-style-type: none"> ● Children, explore shapes around you by tracing them such as various boxes, utensils, shapes of vegetables and fruits etc. from different sides. ● find similarities and differences in two shapes drawn/traced on a surface or paper. ● Do paper folding activities including origami to introduce new shapes that are formed on opening the folds. For instance, triangles and squares are formed when we open a paper boat. ● Draw different shapes on a paper. For this, use round objects like a tumbler or katori to draw a circle, a box to draw four corner shapes by tracing. The shapes can then be coloured by the students. ● Use a dot grid sheet to draw different shapes and designs. You can find many Youtube videos showing such designs drawn on a dotted grid sheet. Make rangoli using different shapes of varied sizes. ● Make number cards(hundred cards, tens cards and ones cards) and use those cards to count numerals. 	<p>Class-III Subject-EVS Holidays Homework</p> <p>1. Collect 5 leaves of medicinal plants/tree. paste the leaf in notebook and write two medicinal value of that plant/tree.</p> <p>2. Write 5 slogans on importance of water in your classwork</p>

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Summer Holiday Homework 2021 For class IV (4)

English

HOLIDAY HOMEWORK
 CLASS: IV SUBJECT: ENGLISH MAY-JUNE 2021
 I. Create a 'Word Web' with words associated with 'Time'

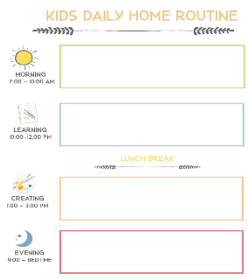


2. Write
 - 2 proverbs
 - 2 quotes
 - 2 tongue twisters
 based on 'Time'

3. Write 5 words each beginning with the following letters

Letter	Words
m	
n	
t	
f	
b	

4. Prepare a daily routine plan



5. Read a story book and write the Book Review
 Title of the Book:

Author:
 Main Characters:
 New Words Learnt:

New Word Learnt	Dictionary Meaning	My Sentence with the word

Hindi

कक्षा 4 ग्रीष्मावकाश

गृहकार्य विषय- हिंदी

- 1) प्रतिदिन दो लाइन सुलेख लिखे।
- 2) अकबर बीरबल की एक कहानी लिखे।
- 3) बादलों पर एक कविता बनाकर लिखो।
- 4) A4 साइज की शीट पर तरह-तरह के बादल बनाकर रूई से सजाएं।
- 5) बारहखड़ी लिखकर अभ्यास करें।
- 6) प्रत्येक मात्रा के दो-दो उदाहरण लिखे।
- 7) गंद से खेलें जाने वाले खेलों के चित्र चिपकाए या बनाए और उनके नाम लिखे।

Maths

CLASS 4
 MATHS HOLIDAY HOMEWORK

Make a net of Cuboid by taking a cardboard sheet. A cuboid of length 15cm, breadth 8cm, and height 6cm:
 Follow the steps in case you need help
 Step1: Draw a rectangle of length 46cm and breadth 14 cm, and divide it into smaller rectangles a
 Step 2: Cut out the two yellow boxes of dimensions 8cm X 8cm to obtain the final structure.

- 2 Learn the table 2 to 9
- 3 Practice all the work done in class
- 4 Make your own scale on the wall and then measure the heights of the family members and to note down the heights in their notebook
 They may also be asked to calculate the difference between your height and your mother's height, and other family members. •

5 Take any 10 things and find their length in cm , and then arrange the things in longest to shortest
 Note take the picture or make the video while performing the activity of 4 and 5
 USE A4 sheet to do the activity , write your name , class on the sheet also make the boundary in the sheet

EVS

CLASS 4
 Summer vacation Holiday Homework

E.V.S Holiday homework

- a) Paste the following pictures
 Five animals which have hair on skin.
 Five animals which have feathers on skin.
- b) Make a poster on chart paper-Different ways of going to school at different places.
- c) Try to make a model of an elephant, (use clay)
- d) Use creative ways to prepare five innovative messages for public awareness on Corona outbreak.
- e) Children may help siblings and elders in various household tasks for the period they spend at home.

Kendriya Vidyalaya Malleshwaram-1
Summer Holiday Homework 2021 For class V (5)

English	Hindi	Maths	EVS												
<p>Class-V Subject- English Holidays Homework</p> <p>1) Write 2-3 lines for handwriting daily.</p> <p>2) Watch a Basketball match and answer the following questions:</p> <p>(i) Name of the teams:</p> <p>(ii) Number of players in each team:</p> <p>(iii) Name of the team which won:</p> <p>(iv) What made the team win the match?</p> <p>3) Watch a Relay race and answer the following questions:</p> <p>(i) How many runners are there in a relay race team?</p> <p>(ii) What do runners carry in their hand while running?</p> <p>(iii) Which team won the race?</p> <p>(iv) What made the team win the race??</p> <p>4) Make sentences from the following words:</p> <p>(i) blaze-</p> <p>_____</p> <p>(ii) cart-</p> <p>_____</p> <p>(iii) sight-</p> <p>_____</p> <p>(iv) sternly _____</p> <p>5) Make something useful from waste material and prepare to speak on the following:</p> <p>(i) Name of the article:</p> <p>(ii) Materials required:</p> <p>(iii) Method of preparing:</p> <p>(iv) How can it be used:</p> <p>6) Make a table to compare the food enjoyed in the childhood by your grandparents, parents and yourself. How did the food habits have changed over the years? Write in a few sentences.</p> <p>7) Read some good stories.</p>	<p>ग्रीष्मकालीन छुट्टियों का गृहकार्य 2021</p> <p>1) अनिवार्य (compulsory) वैकल्पिक शैक्षणिक गतिविधियाँ (AAC)</p> <p>बच्चों अपने घर के सदस्यों के साथ चर्चा कीजिए और उसके बाद ही एक अनुच्छेद लिखिए।</p> <ul style="list-style-type: none"> बच्चों (आप) का घर में कैद हो जाना (कोरोना के इस काल में) अपने अनुभव लिखिए। <p>*संज्ञा के दो प्रकार :- व्यक्तिवाचक तथा जातिवाचक : इनके पाँच-पाँच उदाहरण लिखिए।</p> <ul style="list-style-type: none"> अपनी हिंदी की लिखावट सुधारने के लिए कुछ पंक्तियाँ लिखते रहिए। दोनों पाठ पढ़ने का अभ्यास कीजिए। <p>_____</p> <p>वैकल्पिक -दोनों में से एक (Optional)</p> <p>1. किसी एक पालतू पशु के बारे में संक्षिप्त जानकारी देते हुए एक अनुच्छेद लिखिए। (जैसे (hint)-पशु का नाम, स्थान, खाना, उपयोग या और भी जानकारी)</p> <p style="text-align: center;">अथवा (Or)</p> <p>2) भारत के किसी भी एक राज्य या भाग की विविधता के बारे में संक्षिप्त जानकारी दीजिए। (जैसे- नाम, राजधानी, भाषा, जलवायु, खान-पान, त्योहार, लोकनृत्य, संगीत और भी कुछ वहाँ की खास पहचान)</p>	<p style="text-align: center;">HOLIDAY HOMEWORK</p> <p>CLASS: V SUBJECT: MATHS</p> <p>MAY- JUNE 2021</p> <p>I. <u>Reading of large numbers:</u></p> <p>a) Draw the Indian Place Value Chart till the CRORES place- Look for large numbers (<i>any 6 numbers</i>) in the newspapers / news, and write the number in the chart and read the numbers.</p> <p>b) Write any two numbers in the International Place Value system, Example: 430 175 602 – Four hundred and thirty million one hundred seventy five thousand six hundred two</p> <p>II. Try these Add these large numbers</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: right;">1) $\begin{array}{r} 6045173 \\ + 2146185 \\ \hline \end{array}$</td> <td style="text-align: right;">2) $\begin{array}{r} 1274538 \\ + 6382714 \\ \hline \end{array}$</td> <td style="text-align: right;">3) $\begin{array}{r} 3748295 \\ + 2087537 \\ \hline \end{array}$</td> </tr> <tr> <td style="text-align: right;">4) $\begin{array}{r} 3204832 \\ + 738721 \\ + 1093763 \\ \hline \end{array}$</td> <td style="text-align: right;">5) $\begin{array}{r} 6291873 \\ + 1028372 \\ + 352604 \\ \hline \end{array}$</td> <td style="text-align: right;">6) $\begin{array}{r} 6356213 \\ + 4038267 \\ + 1627392 \\ \hline \end{array}$</td> </tr> </table> <p>III. Subtract</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: right;">1) $\begin{array}{r} 8101050 \\ - 715365 \\ \hline \end{array}$</td> <td style="text-align: right;">2) $\begin{array}{r} 6201106 \\ - 899887 \\ \hline \end{array}$</td> <td style="text-align: right;">3) $\begin{array}{r} 7410011 \\ - 565089 \\ \hline \end{array}$</td> </tr> <tr> <td style="text-align: right;">4) $\begin{array}{r} 3115402 \\ - 269579 \\ \hline \end{array}$</td> <td style="text-align: right;">5) $\begin{array}{r} 6332234 \\ - 485968 \\ \hline \end{array}$</td> <td style="text-align: right;">6) $\begin{array}{r} 4173415 \\ - 994449 \\ \hline \end{array}$</td> </tr> </table> <p>IV. 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Write it on A4 size sheet and colour it. Make your own 'Hygiene Guide' and share it with all family members. What kind of food can help people build the immunity against Corona virus infection? Which food needs to be avoided? Find out. Make a bird feeder using waste material like plastic bottle/cardboard box. Hang it in your balcony or garden and observe it daily. Write a report about it in your notebook. Do some physical workout e.g., skipping, yoga, dance, games, puzzles etc. at home. Parents may accompany their children to motivate them to be healthier and to spend some quality time together. Enjoy and learn. https://nroer.gov.in/55ab34ff81fccb4f1d806025/file/5d232fff16b51c01725582b0
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KENDRIYA VIDYALAYA MALLESWARAM, BENGALURU

HOLIDAY HOMEWORK – ENGLISH CLASSES- 6,8,9,10 SUBJECT TEACHER: REENA K V	
CLASS	HOME WORK
6B & C	<ol style="list-style-type: none">1. FIND 10 WORDS WHICH CAN BE USED BOTH AS A NOUN AND AS A VERB. WRITE IT IN THE NOTEBOOK. PASTE THE PICTURES OF THE WORDS. USE THESE WORDS IN SENTENCES AS NOUN AND VERB.2. INTERVIEW YOUR PARENTS.(QUESTIONNAIRE SHOULD BE BASED ON THEIR CHILDHOOD AND HOBBIES)
8 A &B	<ol style="list-style-type: none">1. TRAVEL BROCHURE OF UTTARAKHAND2. DIARY ENTRY(MINIMUM 3 DAYS IN A WEEK)3. PICTURE STORY OF THE ANT AND THE CRICKET.
9 C	<ol style="list-style-type: none">1. TRAVEL BROCHURE OF UTTARAKHAND.2. DIARY ENTRY (Daily)3. NIE(Newspaper reading based activities)
10 B&C	<ol style="list-style-type: none">1. SURVEY ON READING HABIT.2. DIARY ENTRY(DAILY)

1. CLASS VII - ANY ONE TO BE CHOSEN

a) NIE- NEWSPAPER IN EDUCATION (children who get the English newspaper home)

Children are asked to read the newspaper everyday and write only the headlines two each of International news, National news, Sports news and special news on education, health, environment and science. Added to it one new word they come across in the newspaper to be written with its meaning. They are suggested to make a book by using the blank pages of the last year's books.

b) PARTS OF SPEECH CHART

Children are asked to make a Parts of Speech chart with definitions and examples. They are encouraged to read a story book and write everyday any five parts of speech they come across in the story. They are suggested to make a book by using the blank pages of the last year's books.

CLASS VIII AND IX - ANY ONE PROJECT TO BE DONE

a) NIE- NEWSPAPER IN EDUCATION (children who get the English newspaper home)

Children are asked to read the newspaper everyday and write only the headlines two each of International news, National news, Sports news and special news on education, health, environment and science. Added to it one new word they come across in the newspaper to be written with its meaning. They are suggested to make a book by using the blank pages of the last year's books.

b) TRAVEL BROCHURE

Students select their favourite tourist spot in India. They are asked to design a travel brochure on the place selected containing location, mode of transportation, attractive places to visit etc. A complete guide for anyone to know about the place.

CLASS X – SURVEY ON READING HABITS AMONG SCHOOL GOING CHILDREN

Students will collect ten responses each between the two age groups of 5-10 and 11-15 to the questionnaire on reading habits. Based on the responses received, they would make a report on the reading habits in school students.

विषय हिंदी

कक्षा 6

1. प्रतिदिन हिंदी समाचार पत्र पढ़ना।
2. प्रतिदिन दो लाइन हिंदी में लिखना।
3. प्रतिदिन कम से कम 30 मिनट टीवी में हिंदी भाषा से संबंधित कार्यक्रम देखना।
4. वह चिड़िया जो पाठ को याद करना।
5. प्रतिदिन दो हिंदी शब्द लिखकर उनका वाक्य में प्रयोग करना।
6. कोई 10 विशेषण शब्द लिखना।
7. किन्ही 10 पक्षियों के नाम लिखिए।

कक्षा – सातवीं

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1. 'हम पंछी उन्मुक्त गगन के' कविता के आधार पर निम्न विषय पर अपने विचार लिखिए।
पक्षियों को पालना उचित है या नहीं?
 2. 'दादी माँ' कहानी में आपने निम्नलिखित महीनों के नाम पढ़े जैसे-
द्वार, आषाढ, माघ । इन महीनों में मौसम कैसा रहता है, लिखिए।

3. नदियों से होने वाले लाभों विषय पर 20 पंक्तियों का एक निबंध लिखिए।

4. बहुविकल्पी प्रश्न

1. संज्ञा या सर्वनाम की विशेषता बताने वाले शब्द कहलाते हैं

(i) संज्ञा

(ii) विशेषण

(iii) सर्वनाम

(iv) विशेष्य

2. जिस शब्द की विशेषता बताई जाए, उसे कहते हैं

(i) शब्द

(ii) विशेषण

(iii) विशेष्य

(iv) वाक्य

3. इनमें से कौन-सा विशेषण का भेद नहीं है?

(i) गुणवाचक

(ii) व्यक्तिवाचक

(iii) संख्यावाचक

(iv) सार्वनामिक

4. संख्यावाचक विशेषण के उदाहरण हैं

(i) तेज मरियल

(ii) एक, बहुत

(iii) अगला पिछला

(iv) वीर, हरा

5. 'इतिहास' शब्द का विशेषण रूप है

- (i) इतिहासिक
- (ii) ऐतिहासिक
- (iii) ऐतिहास
- (iv) इतिहासात्मक

5. प्रतिदिन हिन्दी के दो नवीन शब्द लिखकर वाक्य में प्रयोग करें।

6. प्रतिदिन हिन्दी समाचार पत्र पढ़कर दो - दो हिन्दी समाचार लिखिए।

नोट:- 1. अवकाश कार्य A4 शीट पर करना है । आवश्यकता अनुसार विषय संबंधित चित्रों का प्रयोग किया जा सकता है।

2. कार्य सुन्दर और मौलिकता पर आधारित होना चाहिए।

कक्षा 8

• निम्न विषयों में से किसी एक पर निबंध लिखिये (शब्द सीमा 100 शब्द)

क – कोरोना का बिगड़ता स्वरूप और बचाव के उपाय

ख – मेरा प्रिय खेल

ग – पर्यावरण प्रदूषण कारण और निवारण

• रहीम के 5 दोहे लिखकर याद कीजिये ।

• आपने भी अपने जीवन में कभी यात्रा की होगी , उस यात्रा - अनुभव को अपने शब्दों में लिखिए ।

• पूरक पुस्तिका “भारत की खोज” के 02 अध्यायों को पूरा पढ़ें और पाँच महिला स्वतंत्रता सेनानियों का सचित्र ,संक्षिप्त जीवन परिचय लिखिए।

निर्देश:-

*गृहकार्य को A4 शीट में लिखकर फाइल फोल्डर में रखिये ।

* गृहकार्य की हार्डकॉपी स्कैन करके पी. डी. एफ़. बनाकर 10 मई तक गूगल क्लासरूम में जमा कीजिये।

कक्षा 9

• क्षितिज पाठ्यपुस्तक के अध्याय एक ‘कबीर की साखियाँ’ और सबद में साखियों का हिंदी अर्थ लिखिये ।

• एक प्रोजेक्ट फ़ाइल (पोर्टफोलियो) का निर्माण कीजिये जिसमें निम्न कार्य शामिल हों

क)किसी भी एक कवि का जीवन परिचय

ख)कवि का साहित्यिक परिचय

ग) जिस कवि का उल्लेख कर रहे हों उसकी प्रमुख रचनाओं एवं सामाजिक शिक्षाओं के बारे में लिखिए।

*वर्तमान समय में कोरोना की भयावह स्थिति से बचाव हेतु एक अनुच्छेद लिखिये।

*अपने छोटे भाई को जो पढ़ाई के लिए घर से दूर रहता है, उसे कोरोना से सचेत रहने तथा बचाव के उपाय बताते हुए एक पत्र लिखिए।

*हिंदी के प्रचार-प्रसार से सम्बंधित दस महापुरुषों के सद्विचार दृढ़कर लिखिए। निर्देश:-गृहकार्य को A4 शीट में लिखकर फाइल फोल्डर में रखिये।

* गृहकार्य की हार्डकॉपी स्कैन करके पी. डी. एफ़. बनाकर 10 मई तक गूगल क्लासरूम में जमा कीजिये।

कक्षा 10

• कोरोना की भयावह स्थिति से निपटने हेतु 10 महत्वपूर्ण सुझाव लिखिए।

• एक प्रोजेक्ट फ़ाइल (पोर्टफोलियो) का निर्माण कीजिये जिसमें निम्न कार्य शामिल हों :-

क) गोस्वामी तुलसीदास का जीवन परिचय और साहित्यिक परिचय लिखिए।

ख) महाकवि तुलसीदास द्वारा रचित “रामचरितमानस” के बारे में आप क्या जानते हैं, संक्षेप में बताएं ?

ग)तुलसीदास द्वारा रचित रचनाओं के नाम लिखिए।

घ)श्रीराम के चरित्र से आपको क्या शिक्षा मिलती है अपने शब्दों में लिखिए।

ङ) श्रीराम -लक्ष्मण परशुराम संवाद के आधार पर परशुराम के स्वभाव की पाँच विशेषताएं लिखिए।

* देशभक्ति को अपने शब्दों में परिभाषित करते हुए अपने द्वारा किये गए एक सामाजिक कार्य को लिखिए।

निर्देश:-* गृहकार्य A4 शीट में लिखकर फाइल फोल्डर में रखे जाएं।

* गृहकार्य की स्कैन पी. डी. एफ़. कॉपी गूगल क्लासरूम में 10 मई तक अनिवार्य रूप से जमा कर दी जाय।

Subject :Mathematics

CLASS – VI

1. Arrange the following numbers in ascending order:

9801, 25751, 36501, 38802

2. Place Commas correctly and write the numerals:

(a) Thirty three lakh thirty thousand ten.

(b) Forty –seven million three hundred twenty –one thousand three hundred two.

3. Insert the commas and write the names according to Indian and International system of numeration :

(a) 78546723 (b) 99436744

4. Write the next three natural numbers after 10998.
5. Write the three whole numbers occurring just before 10002.
6. Write the Predecessor and successor of the following:
(a) 1997 (b) 13000 (c) 10000
7. Estimate each of the following using general rule :
(a) $5380 + 17987$ (b) $5764 - 438$ (c) 87×313 (d) 958×387
8. How many whole numbers are there between 42 and 63?
9. Write in Roman Numerals: 76 and 97.
10. Find the difference between the greatest and the least number that can be written using the digits 5, 2, 7, 3, 4 each only once.
11. A student multiplied 7236 by 75 instead of multiplying by 57. How much was his answer greater than the correct answer?
12. A truck is loaded with 200 packets of apples. If each box weighs 5 Kg 350 g, then find the total weight of apples in the truck.
13. A train started from Chandigarh for New Delhi. After travel time of 1 hour 45 minutes, train halted at Karnal for 35 minutes. It left Karnal at 11.40 am for New Delhi. If it takes 2 hours 15 minutes to reach New Delhi, then answer the following questions:
(a) At what time did the train start from Chandigarh?
(b) At what time, it reached Karnal?
14. Write the expressions for each of the following using brackets:
(a) Four multiplied by the sum of nine and four
(b) Forty two divided by three times the sum of three and two.
15. The town newspaper is published every day. One copy has 18 pages. Every day 12,980 copies are printed. How many total pages are printed every day.

MATHEMATICS, CLASS – VII

Solve these questions:

1. Evaluate using suitable properties

i. $1385 \times 327 + 615 \times 327$

ii. $(-2) \times 36 \times (-5)$

2. Verify the following:

$$19 \times \{7 + (-3)\} = 19 \times 7 + 19 \times (-3)$$

3. Compare using symbols $>$, $<$ or $=$

i. $(-5) + (-8) \square (-5) - (-8)$

ii $38 + (-20) + (-10) \square 13 + 50 + (-92)$

iii 24

$+ 19 - 42 \square -19 + 29 - 9$

4. In a class test containing 15 questions, 4 marks are given for every correct answer and (-2) marks are given for every incorrect answer. Rohan attempts all questions but only 9 of his answers are correct. What is his total score?
5. Fill in the blanks with an integer to make it a true statement.

i. $28 + 19 = \underline{\hspace{1cm}} + 28$

ii $(-5) \times \underline{\hspace{1cm}} = -45$

iii $\underline{\hspace{1cm}} \times (-11) = -88$

iv $20 + 18 + 5 = 5 + 20 + \underline{\hspace{1cm}}$

6. A submarine submerges at the rate of 5 sm/min. If it descends from 20m above the sea level, how long will it take to reach 250 m below sea level?
7. The table given below shows the elevations relative to sea level of four locations. Taking sea level as zero, answer the following questions.

LOCATION	ELEVATION (in m)
A	-180
B	1600
C	-55
D	3200

- a. Which Location is closest to sea level?
- b. Which location is farthest to sea level?
- c. Arrange the locations from the least to the greatest elevation.

8. Match the following:

$a \times 1$	Additive inverse of a
1	Additive identity
$(-a) \div (-b)$	Multiplicative identity
$a \times (-1)$	$a \div (-b)$
$(-a) \div b$	$a \div b$
0	$a \div (-a)$
$-a$	-a
$a \times 0$	0
	-1

9. Write two integers which are greater than -4 but their difference is smaller than -4.
10. What are the next three consecutive numbers in the pattern?

11, 8, 5, 2, , ,

11. The sum of two integers is 116. If one of them is -79, find the other integers.
12. Write down a pair of integers whose
- sum is -5
 - difference is -7
 - difference is -1
 - sum is 0
13. Using number line, find:
- $3 \times (-5)$
 - $8 \times (-2)$
14. Find the sum of -8, 23, -32, -17 and -63.
15. You have ₹ 500 in your saving account at the beginning of the month. The record below shows all of your transactions during the month. How much money is in your account after these transactions?

Cheque No.	Date	Transactions description	Payment	Deposit
384102	4/9	Jal Board	₹ 120	₹ 200
275146	12/9	Deposit		
384103	22/9	LIC India	₹ 240	₹ 150
801351	29/9	Deposit		

CLASS VIII - MATHEMATICS

Rational Numbers

- Represent $\frac{-2}{11}$, $\frac{-5}{11}$, $\frac{9}{11}$, $\frac{11}{11}$, , , , on the number line.
- Using appropriate properties, find: $-\frac{2}{3} \times \frac{3}{5} + \frac{5}{2} - \frac{3}{5} \times \frac{1}{6}$
- Simplify: $2 + \left(\frac{-5}{11}\right)$
- Find $(x - y) \div (x + y)$ if $x = \frac{3}{4}$, $y = \frac{4}{3}$
- Find a rational number between $-\frac{2}{3}$ and $\frac{1}{4}$
- What is the rational number we get by multiplying $\frac{6}{11}$ by the additive inverse of $\frac{-11}{18}$.
- The product of two rational numbers is $\frac{-4}{27}$ of which one of the numbers is $\frac{-4}{7}$. Find the other number.
- If $x = 23$ and $y = 32$, then find the value of $(x + y) \div (x - y)$

9. Riya earns Rs 18,000 per month. She spends $\frac{1}{6}$ of her income on household items and $\frac{1}{9}$ of income on travelling.
 1 Find the amount she saves in a month?
10. Divide the sum of $\frac{3}{2}$ and $\frac{2}{3}$ by their difference.

Linear Equations in One Variable

1. Solve the following equations:

a) $6x = 12$

b) $\frac{2p}{3} = 18$

c) $2 \cdot 5 = \frac{y}{4}$

2. The sum of two numbers is 65. One of the numbers is 10 more than the other. What are the numbers?
3. The perimeter of a rectangle is 12 cm and its breadth is $2\frac{3}{4}$ cm. Find its length.
4. The present age of Anu's father is four times the present age of Anu. After 3 years their ages will add to 66 years. Find their present ages.
5. Rohan has a total of 100 rupees in coins of denomination 1 rupee, 2 rupee and 5 rupee. The ratio of the number of these coins is 4:3:3 respectively. How many coins of each denomination does he have?
6. Solve: $4x - 6 = x + 4$.
7. Solve: $\frac{3y+1}{2} + 1 = \frac{y-4}{4}$
8. Simplify and solve the following linear equation: $4(t - 4) = 5(2t + 4)$
9. Solve: $\frac{k}{2} - \frac{2k}{3} + \frac{5k}{6} = 24$
10. The present ages of Sonu and Monu are in the ratio 4 : 5. Eight years from now, the ratio of their ages will be 5:6. Find their present ages.

Class IX : Mathematics Art Integrated Project

Submit the project in a stick file on A4 size sheets.

Make it colourful and artistic.

It should have the following:

- Artistic cover page
- Certificate
- Contents

- Introduction to the topic
- Body of the project
- Result
- Conclusion □ Reference

Topic: Collect data on the following topics with respect to the population of the state of Uttarakhand our partner state and present the data collected graphically using pie charts.

- ❖ Languages spoken by the people of Uttarakhand
- ❖ Religion followed by the people of Uttarakhand

It is mandatory for all to submit the project.

Class X : Mathematics Art Integrated Project

Submit the project in a stick file on A4 size sheets.

Make it colourful and artistic.

It should have the following:

- Artistic cover page
- Certificate
- Contents
- Introduction to the topic
- Body of the project
- Result
- Conclusion □ Reference

Topic: Collect data on any one of the following topics with respect to the 13 districts of the state of Uttarakhand our partner state and present the data collected graphically using pictograph, pie chart and bar graph.

Do a comparison of any one of the following across the districts.

- ❖ Number of temples
- ❖ Forest cover in per km²
- ❖ Population in the districts

It is mandatory for all to submit the project.

Subject: Science

Class :VI

1. Complete the exercise questions of Components of food.
2. Prepare a scrap book on Components of food

OR

Grow sprouts, take pictures and write the procedure and observations.

Class :VII

1. Complete the exercise questions of Nutrition in Animals.
2. Make a chart of Human Digestive system.

CLASS :VIII

1. Complete the exercise questions of microorganisms: friend and foe
2. Prepare a scrap book or poster on awareness on covid using newspaper or magazine cutting or by drawing.

OR

Prepare a scrap book or poster on different microorganisms its advantages and harmful effects using newspaper or magazine cutting.

CLASS : IX Physics

1. Numerical from Describing motion.
2. Project Report on "Friction".

CLASS : IX Biology

1. Climate
2. Rain
3. Air Pollution
4. Water Pollution
5. Soil
6. Biogeochemical Cycles
7. Greenhouse Effect and Global Warming
8. Ozone Layer Depletion

CLASS : IX Chemistry

Question1. DIFFUSION

Diffusion refers to the random, microscopic movement of particles of one substance into other substance.

This motion is named after the botanist Robert Brown, who first described the phenomenon in 1827, while looking through a microscope at pollen of the plant *Clarkia pulchella* immersed in water. In 1905, almost eighty years later, theoretical physicist Albert Einstein published a paper where he modeled the motion of the pollen as being moved by individual water molecules, making one of his first major scientific contributions. This explanation of Brownian motion served as convincing evidence that atoms and molecules exist and was further verified experimentally by Jean Perrin in 1908. Perrin was awarded the Nobel Prize in Physics in 1926 "for his work on the discontinuous structure of matter".¹

Use this information to answer the following questions-

Diffusion depends upon

Temperature

Pressure

Molecular size

Only (a)

Only(b)

Both (a) and (b)

(a), (b), (c)

Does change in temperature affect diffusion? Explain.

Which of the following statement is correct?

Diffusion is fastest in gases and slowest in solids.

Diffusion doesn't take place in solids

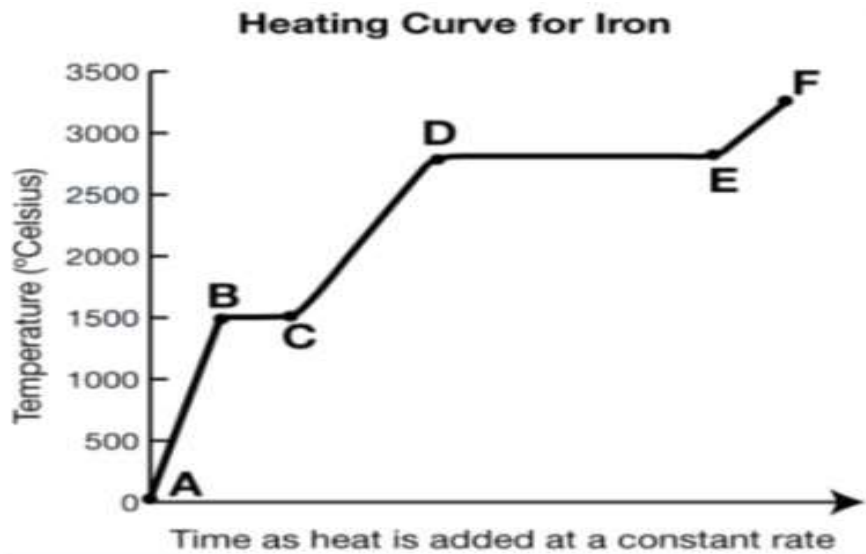
Diffusion takes place from lower concentration to higher concentration

(iv) Diffusion is fastest in liquids

Which gas will diffuse faster Helium or hydrogen?

Question2. HEATING CURVE

Different substances have different melting points and boiling points, but the shape of their heating curves are very similar. For example heating curve for iron is shown below-



Answer the following questions-

1. What does the portion BC and DE represent?
2. What are the melting point and boiling point of iron?
3. In portion BC, as the time increases temperature does not change, why?
4. EF represents which phase of iron?
 - (i) Liquid phase
 - (ii) Solid phase
 - (iii) Gaseous phase
 - (iv) Solid and liquid phase together

Answer the following questions-

1. What does the portion BC and DE represent?
2. What are the melting point and boiling point of iron?
3. In portion BC, as the time increases temperature does not change, why?
4. EF represents which phase of iron?
 - (v) Liquid phase
 - (vi) Solid phase

- (vii) Gaseous phase
(viii) Solid and liquid phase together
5. Melting points of different compounds are given below. According to the table, in which of the following compounds the force of attraction between the molecules is strongest?
- (i) MgO
(ii) Al₂O₃
(iii) MnO₂
(iv) Co₃O₄

Oxide	Melting Point (K)
Al ₂ O ₃	2345
MgO	3125
CaO	2837
Cr ₂ O ₃	2539
MnO ₂	808
Fe ₂ O ₃	1867
Co ₃ O ₄	1163-1213
NiO	2257
Y ₂ O ₃	2683
CeO ₂	2873
ZrO ₂	2973

Class X A,B,C - SCIENCE

I. Science project- Portfolio.- Do project on any one of the following topics:

1. Ganga action plan (GAP)
2. Conservation and judicious use of natural resource
3. Coal and Petroleum conservation.
4. Big dams: advantages and limitations; alternatives, if any.
5. Sustainability of natural resources.
6. Wildlife conservation.

7. Any other topic from Management of natural resources.

II. Completion of classwork and home work.

Subject : Sanskrit

कक्षा षष्ठी (Class- VI)

1. संस्कृते नामानि लिखत -(चित्र सहितम्) (संस्कृत में नाम लिखो चित्र के साथ)

क. पञ्च फलानि

ख. पञ्च पक्षिणः

ग. पञ्च शाकानि

2. संस्कृते 1-10 संख्यावाचीशब्दाः लिखत (एक से दस तक संस्कृत में संख्यावाची शब्द लिखो)

3. दस पदानां वर्ण विच्छेदं उदाहरणमनुसारम् कुरुत (उदाहरण के अनुसार १० शब्दों का वर्ण विच्छेद करो)

(i) पुस्तकम् (ii) रुचिरा (iii) गीता (iv) पाठः (v) विद्यालयः (vi) अध्यापकः (vii) पिता (viii) चषकः (ix) पठति (x) बालकः (xi)माला

उदाहरण - 1. पुस्तकम् = प्+ उ+ स्+ त्+ अ+ क्+ अ+ म्

4. दश पदानां वर्ण संयोजनम् उदाहरणमनुसारम् कुरुत (उदाहरण के अनुसार 10 शब्दों का वर्ण संयोजन करो)

उदाहरण - 1. म् +आ+ त्+ आ = माता

2. ब् +आ+ ल्+ इ+ क+ आ =

3. र्+ आ+ म्+ आ+ य्+ अ+ ण्+ अः =

4. भ्+ आ+ र्+ अ+ त्+ अः =

5. म्+आ+ल्+ आ =

6. ग्+ ई+ त्+ आ =

7. व्+ इ+ द्+ य्+ आ =

8. द्+अ+ श्+ अ =

9. म्+अ+ ह्+ आ+ भ्+ आ+ र्+ अ+ त्+ अ =

10. छ्+ आ+ त्+ र्+ अः =

5. दश शब्दानां एकवचनम् द्विवचनम् बहुवचनम् रूपाणि लिखत (10 शब्दों के एकवचन, द्विवचन और बहुवचन के रूप लिखिए)

पदानि	एकवचनम्	द्विवचनम्	बहुवचनम्
चषक	चषकः	चषकौ	चषकाः
छात्र	छात्रः	.....	.....
मयूर	.....	मयूरौ	.....

वृक्ष	.....	.....	वृक्षाः
अश्व	.....	अश्वौ	.....
गीता	गीता	गीते	गीताः
महिला	महिला	.....	.....
चटका	.....	चटके	.....
शिक्षिका	.....	.....	शिक्षिकाः
सेविका	.....	सेविके	.....
वीणा	वीणा	.....	.....

कक्षा सप्तमी (Class-VII)

1. स्वपरिचयः (Self Introduction) संस्कृते लिखत
2. गृहे उपयुज्मानानां दश वस्तूनां नामानि संस्कृते लिखत (घर में इस्तेमाल करनेवाली दश वस्तुओं के नाम संस्कृत में लिखिए)
3. विद्यालये उपयुज्मानानां दश शब्दानां नामानि संस्कृते लिखत (विद्यालय में प्रयोग होने वाले दश शब्दों के नाम संस्कृत में लिखिए)
4. शब्दरूपाणि लिखत (नीचे लिखे शब्द रूपों को लिखिए)
 - अकारान्त पुल्लिङ्गशब्दाः = बालकः, नरः, छात्रः
 - आकारान्त स्त्रीलिङ्गशब्दाः = बालिका, गीता, लता
 - अकारान्त नपुंसकलिङ्गशब्दाः = फलम्, पुस्तकम्, पुष्पम्
5. अधोलिखितानि धातुरूपाणि त्रिषु लकारेषु (लट् लकार, लृट् लकार, लङ् लकार) लिखत

(नीचे लिखे धातु रूपों को तीनो लकार में लिखिए (लट् लकार- वर्तमान काल) (लृट् लकार- भविष्यत काल) (लङ् लकार- अतीत काल)

- पठ् धातु (पढना)
 - खाद् धातु (खाना)
 - चर् धातु (चलना)
 - कृ धातु (करना)
6. संस्कृते (1-20) संख्यावाचीशब्दाः लिखत (एक से बीस तक संस्कृत में संख्यावाची शब्द लिखो)

अष्टमी कक्षा 8th standard

विषय:- संस्कृतम्

विरामकालीनं गृहकार्यम् holiday homework

(Write the following homework given in your classwork with the heading “विराम-कालीनं गृहकार्यम्”)

- 1) ‘इ’ इकारान्त-स्त्रीलिङ्गस्य ‘मति’ शब्दस्य रूपाणि दृष्ट्वा तथैव चतुर्णां इकारान्त-शब्दानां रूपाणि लिखत। (नीति, सूक्ति, गति, शान्ति)
- 2) चतुरः सूभाषितस्तोकान् (पाठ्यपुस्तकात् बहिस्थान) लिखित्वा तेषाम् अर्थं च लिखत।
- 3) ‘अस्माकम् विद्यालयः’ अथवा ‘मम गृहम्’ ‘अस्माकम् नगरम्’ एतेषु एकस्मिन् विषये दश वाक्यानि लिखत।
- 4) गृहे उपयुज्यमानानां दश वस्तुनां नामानि संस्कृते लिखत

नवमी कक्षा 9th standard

(Write the following homework given in your classwork with the heading “विराम-कालीनं गृहकार्यम्”)

- 1) विंशति वाक्यानि स्वं लिखित्वा संस्कृते अनुवादं कुरु ।
(बीस वाक्यों को खुद लिखकर संस्कृत में अनुवाद कीजिए।)
- 2) प्रथमः, द्वितीयः पाठयोः क्रियापदानि चित्वा तेषां लकार-पुरुष-वचनानि लिखत।
(पहले, दूसरे पाठ के क्रिया पदों को चुनकर उनके लकार पुरुष और वचन लिखिए।)
- 3) एकस्य महापुरुषस्य विषये अथवा “अस्माकम् भारतदेशः” इत्यस्मिन् विषये दश वाक्यानि संस्कृते लिखत।
(एक महापुरुष के बारे में अथवा “अस्माकम् भारतदेशः” के बारे में दश वाक्य संस्कृत में लिखिए।)
- 4) बालकः, साधुः, फलम्, लता, नदी शब्दरूपाणि लिखित्वा कण्ठस्थ कुरुत।
(बालक, साधु, लता, नदी, और फल शब्दरूपों को लिखकर याद करे।)
- 5) भू(भव), गम्, दृश्, अस्, पा(पिब) पञ्च लकारेषु धातुरूपाणिलिखत।
(भू, गम्, दृश्, अस् और पा धातुओं को पांच लकार में लिखे।)

दशमी कक्षा 10th standard

(Write the following homework given in your classwork with the heading “विराम-कालीनं गृहकार्यम्”)

- 1) एक- दिनस्य संस्कृतवार्ता लिख।

(बालिका: प्रातःकालीनवार्ताम्, बालका: सायंकालीनवार्ताम् लिखत।)

2) पञ्चचित्राणि संगृह्य तेषां विषये पञ्चवाक्यानि लिखत।

3) त्रीन् पाठान् वाचयित्वा ध्वनिमुद्रिकां कृत्वा WhatsApp द्वारा प्रेषयन्तु।

Subject: SOCIAL SCIENCE

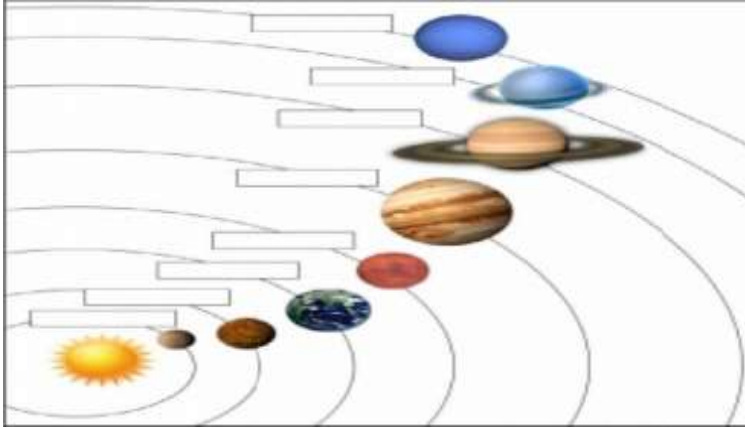
I. Define the following:

- Inscription
- Archaeologists
- Manuscripts

II. Draw the outline map of India and mark the following:

- Ganga R, Indus R, Garo Hills, Kirthar and Suliman Hills.

III. Draw and label the planets of our Solar System:



IV. Describe these:

- Asteroids
- Meteoroids
- Stars
- The Earth
- The Sun and the Moon

V. Make a list of any five states of India showing the following points:

Language spoken, food festivals, dance forms, dress worn, religious places etc.

KENDRIYA VIDYALAYA MALLESWARAM
HOLIDAY'S HOMEWORK – (SOCIAL SCIENCE)

CLASS-7

1. On the outline map of India mark the following places and dynasties
(History ch. -2)

- (a) cholas (b) cheras
- (c) pandyas (d) Rashtrakutas
- (e) Kanauj (f) Chahamanas

2. Make a poster/Collage

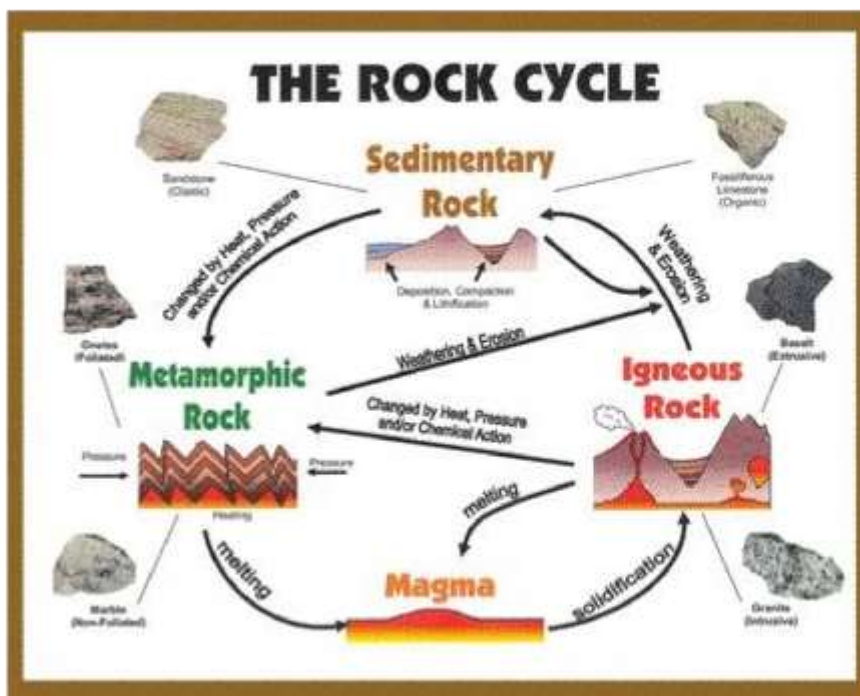
- Rock cycle
- Interior of the Earth.

3. Make a chart on three organs of the Government.

4. Learn Ex. Q-A

- Geography ch-1,2
- History ch- 1,2
- Civics ch-1

5. In the given diagram of Rock cycle answer the following questions:



(a) Explain the term Rock cycle.

(b) How one type of rock changes to another in a cyclic manner?

(c) Red Fort is made up of which rock?

6. In the given picture and answer the following questions:



- Look at the picture and identify the scheme of the government.
- Which state introduced this scheme for the first time in India.
- Write two advantages of this scheme.

Class-8

History

I. Prepare a character sketch for any two of the following:

- a) Tipu Sulthan
- b) Kitoor Rani Channamma
- c) Sirajuddaulah
- d) Maharaja Ranjith Singh

II. Locate the centres of Revolt of 1857 on the Map of India.

Social and Political Life

List in detail the Key features of our Indian Constitution.

a) Define the following terms:

- i) Tyranny ii) Arbitrary iii) Human Trafficking

Geography

I. Differentiate between :

- i) Renewable and Non-renewable resources
- ii) Potential and actual resources iii) Ubiquitous and localised resources

II. Explain the meaning and principles Sustainable Development.

Suggest your own ideas to maintain the Sustainable Development.

KENDRIYA VIDYALAYA MALLESWARAM
HOLIDAY HOME WORK
CLASS-IX
SOCIAL SCIENCE

1. Prepare a detailed project on : - "Disaster Management"

Do anyone of the following.

- A. Earthquake
- B. Flood
- C. Drought
- D. Landslide
- E. Cyclone

(* collect information from various sources like -newspapers, articles from magazine.

* Collect information on immediate response of various agencies like - police, hospitals, district administration etc.

* Discuss the role of authorities , Indian and international agencies (CRY, WHO, UNO) in rehabilitation process.

* in conclusion highlight the mitigation process including identification of risk zones, community awareness and individual response.

* A case study of supplement and build upon the project shall be appreciated.)

Guidelines for the project:

a) Project to be done on A4 sheet.

b) Project should be hand written . (approximately 15 pages).

c) On first page students performa should be written – Name, Class, Roll no., Name of the school,Topic .

2. Prepare a scrap book on the topic "Azadi ka Amruth Mahotsav "

1) Students you can use any scrap book if you already have.

I would not suggest you to buy a new one because of the pandemic .

2) You can make one with using A4 sheets or plain papers .

3) Write the above sent title on the cover page.

4) Pictures can be collected from any medias avoid going out for this reason.

5.) Do not force your parents to buy materials instead think substitute innovative ideas.

you can choose any topic for ex: Freedom fighters

Freedom movements

The role women in Indias freedom

movement etc.

CLASS-X (SOCIAL SCIENCE)

Prepare a detailed project on any one of the following topics.

Project 1:- Consumer Rights

- Different types of consumers rights that you have as a consumer.
- COPRA
- Role of courts in implementation of consumer rights.
- How you can spread consumer awareness.
- Case study

Project 2:- Social Issues (Students may select any one topic related with social issues)

Some suggested topics are given below)

- Gender issue
- Caste issue
- Linguistic diversity
- Regionalisation
- Economic disparities
- Religious diversity
- Environmental issue

Project 3:- Sustainable Development

- Meaning of sustainable development
- Issue of sustainable development
- Importance of sustainable development
- Meetings/reports/summit related to sustainable development
- Current status of development

Project should be developed and presented in this order

- I. Cover page showing project title
- II. schools name, students name, class and section and academic session (year)
- III. List of contents with page number (Index) (approx...15 pages)

Class -12
Holiday Home Work

Subject: Maths

Matrices : Misc. Examples & Misc. Exercise

Determinants : Misc. Examples & Misc. Exercise

Subject: English

1. Preparing the topic for Speaking Skill
2. Questions from Keeping Quiet to be completed

Subject: Hindi

1. भक्तिन, बाजार दर्शन, आत्म परिचय, दिन जल्दी जल्दी ढलता है, सिल्वर वेडिंग पाठ में उल्लिखित प्रश्नों के उत्तर लिखें।
2. लघु उत्तरात्मक
3. दीर्घ उत्तरात्मक
4. व्याख्यात्मक एवं सौन्दर्य बोध से संबंधित प्रश्नोत्तर
5. निबंध-, पत्र, फीचर लेखन (उपभोक्तावाद की संस्कृति)
6. कोरोना वायरस का पूरे विश्व पर दुष्प्रभाव एवं उससे बचने के उपाय पर एक निबंध और नाटक तैयार करें।
7. परियोजना कार्य - तुलसीदास पर एक डॉक्यूमेंट्री तैयार करें।

Subject: Economics

ACTIVITIES IN SCRAP BOOK

1. Prepare a pie chart for the occupational structure in India at the time of independence.
2. Prepare a chart on the different types of economic systems prevalent in the world. List out the countries as capitalist socialist and mixed economy.
3. Prepare a poster which contains 10-15 news clippings which you consider as important and relating to navaratnas from newspapers. Also collect/draw the logos and advertisements of these PSUs.
4. Prepare a chart consisting a list of five companies that have BPO services in India along with their turnover.

Subject: Business Studies

1. Preparation of CBSE project for 20 marks

Subject: Accountancy

1. Preparation of CBSE project for 20 marks.

Subject: Chemistry

SOLID STATE

1 Mark questions with answers.

1. Which point defect lowers the density of Ionic crystals.

Ans: Schottky defects.

2. Why Frenkel defect does not change the density of AgCl crystal?

Ans: The atom or ion is displacing from normal site to interstitial site (and it is not completely missing)

3. Why is Frenkel defect not found in pure alkali metal halides?

Ans: Because ions cannot get into the interstitial sites.

4. What is the arrangement of Zn^{2+} and S^{2-} ions in zinc blende (ZnS) crystal structure?

Ans: S^{2-} form cubic close packing where as Zn^{2+} occupy half of the tetrahedral voids.

5. What is the co-ordination number of an octahedral void?

Ans: 6

6. In a rock salt structure how many Na^+ ions occupy nearest neighbour location of Na^+ ion?

Ans: 12

7. How many Cs^+ ions occupy second nearest neighbour locations to central Cs^+ ions in $CsCl$ crystal?

Ans: 6

8. In CaF_2 structure what would be the co-ordination number of calcium and fluoride ions.

Ans: $Ca^{2+} = 8$ $F^- = 4$

9. Give two examples of antifluorite structure?

Ans: Li_2O , K_2S

10. An ionic compound AB_2 possesses CaF_2 type crystal structure. Write the co-ordination numbers of A^{2+} and B^- ions in crystal of AB_2 .

Ans: $A^{2+} = 8$ $B^- = 4$

11. What is the effect of Frenkel structural defect on the electrical conductance of a crystalline solid?

Ans: Increases conductivity.

12. What may be the difference between phosphorous doped and gallium doped semi-conductors?

Ans: Doping with phosphorus gives rise to electronic conduction (n – type) where as doping with gallium gives rise to positive hole conduction (p –type)

$$a^3 = \frac{2 \times 93}{8.55 \times 6.023 \times 10^{23}} = 36.08 \times 10^{-24} \text{ cm}^3$$

$$a = 3.304 \times 10^{-8} \text{ cm}$$

$$a = 3.304 \times 10^{-8} \times 10^{10} \text{ pm} \rightarrow a = 330.4 \text{ pm}$$

$$4r = \sqrt{3}a \rightarrow r = \frac{\sqrt{3}}{4} \times a = \frac{1.732}{4} \times 330.4 = 14.32 \text{ nm}$$

6. Gold (atomic radius = 0.144 nm) crystallizes in a FCC unit cell. What is the length of a side of the cell?

Ans: $r = 0.144 \text{ nm}$

In FCC element $4r = \sqrt{2} a$

$$\rightarrow a = \frac{4r}{\sqrt{2}} = \frac{4 \times 0.144 \text{ nm}}{1.414} = 4.073 \times 10^{-10} \text{ m}$$

7. What are 13 – 15 and 12 – 16 compounds?

Ans: When the solid-state materials are produced by combination of elements of group 13 and 15, these compounds are called 13 – 15 compounds. Ex: InSb, AlP, GaAs. They act as semiconductors. When the solid-state materials are formed by group 12 and 16 elements they are called 12 – 16 compounds. Ex: ZnS, CdS, CdSe, HgTe.

9. Classify each of the following as either p-type or as n – type semiconductors.

(i) Ge doped with In (ii) B doped with Si

Ans: i. p – type semiconductor ii. n – type semiconductor.

10. The ions of NaF and MgO all have the same number of electrons, and the internuclear distances are about the same (235 pm and 215 pm). Why the melting points of NaF and MgO so different. (992°C and 2642°C).

Ans: In MgO, the charge Mg^{2+} is 2 and O^{2-} ion is 2, there is a stronger force of attraction between ions than in Na^+ and F^- , therefore, MgO has higher lattice energy and therefore higher melting point than NaF.

3 Marks questions with answers.

4. Aluminium crystallizes in a CCP structure. Its metallic radius is 125 pm.
a. What is the length of the side of the unit cell?
b. How many unit cells are there in 1 cm^3 aluminium.

Ans: a. Since Al crystallizes in a CCP structure.

$$4r = \sqrt{2} a$$

$$a = \frac{4r}{\sqrt{2}} = \frac{4 \times 125 \text{ pm}}{1.414} = 353.6 \text{ pm}$$

b. $a^3 = (353.6 \times 10^{-10} \text{ cm})^3$ is the volume of 1 unit cell.

$$\text{No. of unit cells in } 1 \text{ cm}^3 \text{ volume} = \frac{1}{(353.6)^3 \times 10^{-30}} = 2.26 \times 10^{22} \text{ unit cells}$$

5. Determine the type of cubic lattices to which the iron crystal belongs if its unit cell has an edge length of 286 pm and the density of iron crystals is 7.86 g cm^{-3}

$$\text{Fe} = 56 \text{ gmol}^{-1} \quad N_A = 6.02 \times 10^{23} \text{ mol}^{-1}$$

Ans: $d = \frac{ZM}{a^3N}$

$$Z = \frac{da^3N}{M} = \frac{7.86 \text{ cm}^{-3} \times (286 \times 10^{-10})^3 \times 6.02 \times 10^{23} \text{ mol}^{-1}}{56}$$

6. Chromium has monoatomic BCC structure. Its cell edge is 300 pm. What is its density? (Molecular mass of chromium = 52 g mol⁻¹ NA = 6.023 x 10²³ mol⁻¹)

$$\text{Ans: } \rho = \frac{Z M}{a^3 N_A}$$

$M = 52 \text{ g mol}^{-1}$
 $N_A = 6.023 \times 10^{23}$

$$= \frac{2 \times 52}{(300 \times 10^{-10})^3 \times 6.023 \times 10^{23}}$$

$$= 6.39 \text{ g cm}^{-3}$$

SOLUTIONS

1 Mark questions with answers

1. When is value of Van't Hoff factor more than one?

Ans: It is in case of strong electrolytes.

2. What kind of deviation is shown by a solution of acetone and CS₂?

Ans: Positive deviation.

3. Why is benzene insoluble, in water but soluble in toluene?

Ans: Benzene is non polar, therefore insoluble in water (polar solvent), where as it is soluble in toluene which is a non polar solvent

4. What is the expected Van't Hoff factor for K₃[Fe (CN)₆]

Ans: Four

5. Suppose a solid solution is formed between two substances, one whose particles are very large and the other whose particles are very small. What type of solid solution is this likely to be?

Ans: The solid solution is interstitial solid solution.

6. When fruits and vegetables are dried and placed in water, they slowly swell and return to original shape, why? Does increase in temperature accelerate this process?

Ans: It is due to osmosis. Increase in temperature will accelerate osmosis.

7. Why do gases nearly always tend to be less soluble in liquids as the temperature is raised.

Ans: When temperature is raised, force of attraction between gas molecules and liquid molecules decreases. Solubility decreases on increasing temperature.

8. The osmotic pressures of polymers (macro molecules) are determined by osmotic pressure and not by other Colligative properties. Explain?

Ans: It is because osmotic pressure is measured at room temperature, where as macro-molecules undergo change in structure at high temperature.

9. Why is CaCl_2 used to remove snow on roads?

Ans: Addition of CaCl_2 lowers the freezing point of water.

10. What is Henry's law?

Ans: Solubility of a gas in a liquid is directly proportional to the pressure of the gas

11. What would be the value of 'i' if solute molecules undergo association in solutions?

Ans: $i < 1$

12. Name a solution of gas in water, which is used, as a cleaning solution in houses.

Ans: Solution of ammonia in water.

13. Two liquids A and B have boiling point 100°C and 120°C respectively. Which of them would show higher vapour pressure?

Ans: A, lower the boiling point, greater will be the tendency to evaporate.

14. The osmotic pressure of 1.M sodium chloride solution is twice that of 1M glucose solution. Give reason.

Ans: Due to dissociation of Sodium chloride, the solution contains 2 moles of ions per litre whereas glucose molecules remain undissociated.

15. Give some important applications of Henry's law.

Ans: i) Solubility of CO_2 is increased at high pressure

ii) Mixture of He and O_2 are used by deep sea divers because He is less Soluble than nitrogen.

16. What is effect of temp on (i) Molarity (ii) Molality

Ans. Molarity – Decreases with increase in temp.

Molality – Does not depend on temp.

17. What is the effect of temp on vapour pressure of liquid?

Ans. With the increase of temp, the vapour pressure of the liquid will also increase.

18. Give one practical application of depression of freezing point?

Ans: Use of antifreeze solutions in radiators of vehicles.

19. Why common salt is added to water used for boiling of eggs to get hard-boiled eggs?

Ans: Addition of salt to water elevates the boiling point of water.

2 Marks questions with answers

1. Mixing acetone with chloroform takes place with reduction in volume. What type of deviation of Raoult's law is shown in this case and why?

Ans: Negative deviation. Decrease in volume of solution indicates strong forces of attraction between the molecules in solution.

2. What care is usually taken during intravenous injections and why?

Ans: The concentration of the solution should be approximately same as that of blood plasma, so that they are isotonic.

If solution to be injected is hypertonic, it will cause cells to shrink. If it is hypotonic, the cells will burst

3. What type of deviation from ideal behaviour will be shown by a solution of cyclohexane and ethanol?

Ans: Positive deviation that is vapour pressure of each component in the solution will increase. In ethyl alcohol the molecules are hydrogen bonded, but the addition of cyclohexane will break some of the hydrogen bonds. Therefore the vapour pressure of the resulting solution will be more. Therefore the solution shows positive elevation.

4. Molal elevation constant for benzene is 2.52 K/m. A solution of some organic substance in benzene boils at 0.126°C higher than benzene. What is the Molality of the solution?

Ans: $\Delta T_b = K_b m$
 Given $\Delta T_b = 0.126^\circ$
 $K_b = 2.52 \text{ K/m}$
 $m = \frac{\Delta T_b}{K_b} = \frac{0.126}{2.52} = 0.05 \text{ molKg}^{-1}$

5. What is azeotropic solution? Give an example of maximum boiling azeotrope and minimum boiling azeotrope?

Ans: An azeotrope is a constant boiling solution in which both the solute and solvent boil at the same temp at a particular composition.

Maximum boiling azeotrope eg: H₂O & HCl

Minimum boiling azeotrope eg: H₂O & C₂H₅OH

6. Sometimes the molecular masses determined from Colligative property of solution show abnormal results. Explain?

Ans: Abnormal results are obtained for molecular mass of the solute when it undergoes either association or dissociation in solution. In association, the molecular mass becomes more while in dissociation it becomes less.

7. Calculate the molar concentration of urea solution if it exerts an osmotic pressure of 2.45 atm at 300 K.

ans: $\pi = CRT$

Given $\pi = 2.45 \text{ atm}$, $T = 300 \text{ K}$, $R = 0.082 \text{ L atm mo}^{-1} \text{ K}^{-1}$

$$C = \frac{\pi}{RT} = \frac{2.45}{0.082 \times 300} = \frac{2.45}{24.6} = 0.099 \text{ mol L}^{-1}$$

8. What is reverse osmosis? Give its one use?

Ans: If the solvent and solution are separated by a semi-permeable membrane and an external pressure greater than osmotic pressure is applied on solution side then the solvent molecules start passing from solution side to solvent side through the semi – permeable membrane. This is known as reverse osmosis.

9. Give one example each of miscible liquid pairs showing positive and negative deviations from Raoult's law. Give one reason for such deviation.

Ans: +ve deviation is shown by ethanol and water, cyclohexane and ethanol, acetone and diethyl ether, etc.

Reason: A – B interaction is weaker than A –A or B – B interactions.

-ve deviation is shown by chloroform and acetone, methanol and acetic acid, H₂O and HCl, H₂O and HNO₃ etc ..

Reason : A – B interaction is stronger than A – A or B – B interactions.

10. Draw a suitable labeled diagram to express the relationship for ideal solution of A and B between vapour pressure and mole fraction of components at constant temperature.

Ans:

Refer to Fig. 3.5 on page no. 56 of NCERT Text book for class XII

11. Illustrate elevation in boiling point with the help of vapour pressure – temperature curve of a solution. Show that elevation in boiling point is a Colligative property.

Ans:

Refer to Fig. 3.8 on page no. 59 of NCERT Text book for class XII

As is clear from the above diagram elevation in boiling point depends upon the relative number of moles of solute and solvent but does not depend upon the nature of solute.

12. What role does the molecular interaction play in solution of alcohol and water?

Ans: Alcohol is polar compound. It can form hydrogen bond with water molecules that is why alcohols are miscible with water in all proportion.

- 13 Conc. HNO_3 used in the laboratory work is 68% HNO_3 by mass in aqueous solution. What is the molarity of such a sample of the acid if the density of solution is 1.504 gm/ml?

Ans:

$$M = \frac{\% \text{ mass} \times d \times 10}{\text{Mol. mass}}$$
$$= \frac{68 \times 1.504 \times 10}{63} = \frac{1022.72}{63} = 16.233 \text{ M}$$

- 14 A sample of drinking water was found to be contaminated with chloroform (a carcinogen). The level of contamination was 15ppm (by mass)

a) express this in terms of percent by mass

b) Determine the molality of chloroform in the water sample

Ans: 15ppm means 15g of CHCl_3 is present in 106 grams of solution

106 g solution contain 15g

100g solution contains?

$$= \frac{15 \times 100}{106} = 14.15$$

for molality

$$m = \frac{W_B \times 1000}{M_B \times W_A}$$

$W_B = \text{Wt of solute} = 15\text{g}$ $M_B = \text{molecular mass of solute} = 119.5$

$W_A = \text{weight of solvent} = 106$

$$m = \frac{15 \times 1000}{119.5 \times 106} = 0.1255 \times 10^{-3} = 1.255 \times 10^{-4} \text{m}$$

$$119.5 \times 10^6$$

15 The vapour pressure of water is 12.3 kpa at 300 K. Calculate vapour pressure of 1 molar solution of a solute in it.

$$\text{Ans: } \frac{P^{\circ} \text{ solvent} - P \text{ solution}}{P^{\circ} \text{ solvent}} = \frac{W \text{ solute} \times M \text{ solvent}}{M \text{ solute} \times W \text{ solvent}}$$

$$\frac{12.3 - P \text{ solution}}{12.3} = \frac{1 \times 18}{1000}$$

$$12.3 - 12.3 \times 18 = P \text{ solution}$$

$$12.3 - 0.2214 = P \text{ solution}$$

$$\therefore P \text{ solution} = 12.07 \text{ kpa}$$

17. The freezing point depression of 0.1 molal solution of benzoic acid is 5.12 k kg mol⁻¹. Calculate the van't Hoff factor for benzoic acid in benzene. What conclusion can you draw about the molecular state of benzoic acid in benzene.

$$\text{Ans: } \Delta T_f = i k_f \times m$$

$$0.256 = i \times 5.12 \times 0.1$$

$$i = \frac{0.256}{0.512}$$

$$= \frac{1}{2}$$

i value suggests that benzoic acid exists as a dimer.

18. Calculate the mass of a non volatile solute (molecular mass 40) which should be dissolved in 114 g of octane to reduce its vapour pressure to 80%

$$\text{Ans: } \frac{P^{\circ} \text{ solvent} - P \text{ solution}}{P^{\circ} \text{ solvent}} = \frac{W_B \times M_A}{M_B \times W_A}$$

$$\frac{100 - 80}{100} = \frac{W_B}{40} \times \frac{114}{114}$$

$$= \frac{20}{100} = \frac{W_B}{40}$$

$$W_B = 8 \text{ gm}$$

$$W_B = \text{Wt of solute}$$

$$M_B = \text{MWt of Solute}$$

$$M_A = \text{MWt of solvent}$$

$$W_A = \text{Wt of solvent}$$

19. An aqueous solution of 2 % non-volatile solute exerts a pressure of 1.004 bar at the boiling point of the solvent. What is the molecular mass of the solute?

$$\text{Ans: } \pi V = \frac{W_B}{M_B} RT$$

$$\pi = 1.004 \text{ bar} \quad W_B = 29$$

$$V = 100 \text{ ml} = 0.1 \text{ lit} \quad M_B = ?$$

$$T = 373 \text{ K}$$

$$1.004 \times 0.1 = \frac{2 \times 0.0821 \times 373}{M_B}$$

$$M_B = \frac{2 \times 0.0821 \times 373}{1.004 \times 0.1}$$

$$= 619.18 \text{ g / mol}$$

3 Marks questions with answers

Q1. State Raoult's law for solution of non-volatile solutes in volatile solvents. Derive a mathematical expression for this law.

Ans: According to Raoult's law relative lowering of vapour pressure is equal to the mole fraction of non-volatile solute at a particular temp.

$P_A \propto X_A$ where P_A - v.p of solution
 X_A - mole fraction of solvent

$$P_A = K X_A$$

For pure liquid $K = P_A^0$ (v. p of pure solvent)

$$\therefore P_A = P_A^0 X_A \text{-----(1)}$$

if X_A & X_B are mole fractions of solute & solvent, then $X_A + X_B = 1$

$$\text{or } X_A = 1 - X_B \text{-----(2)}$$

Substituting (2) in (1)

$$P_A = P_A^0 (1 - X_B)$$

$$P_A = P_A^0 - P_A^0 X_B \quad \text{i.e., } P_A^0 - P_A = P_A^0 X_B$$

$$X_B = \frac{P_A^0 - P_A}{P_A^0}$$

$\frac{(P_A^0 - P_A)}{P_A^0}$ is called relative lowering of v.p

Q 2. During throat troubles a gargle with warm saline water gives relief. Explain

Ans: In throat more water accumulates in the cells and the fluid becomes hypotonic causing swelling. A gargle with warm saline water gives relief because the saline water is hypertonic, therefore extra water which was accumulated inside the membrane comes out into saline water by osmosis. Here water diffuses from hypotonic solution into hypertonic solution through the membrane.

Q3. CaCO_3 shell is removed from two eggs by treatment with dil HCl. One of the eggs is then placed in pure water while the other in saturated solution of NaCl. What would be observed and why?.

Ans: The egg placed in water will increase in size due to osmosis of pure water into the egg, while the other placed in NaCl solution, will shrink due to osmosis of water out of the egg.

Q4. What is meant by positive and negative deviation from Raoult's law, and how is the sign of ΔH related to +ve and -ve deviations from Raoult's law.

Ans: In these non-ideal solutions, partial vapour pressure of component 'A' or 'B' in the mixture of A and B is more than that calculated from Raoult's law. This type of deviation from Raoult's law is called +ve deviation from Raoult's law. Ex. Water and ethanol chloroform and water, ethanol and CCl_4 . For positive deviation $\Delta H_{\text{mixing}} > 0$.

Negative deviation from Raoult's law. The partial vapour pressure of component A is found to be less than calculated from Raoult's law on adding the second component 'B'. This type of deviation from ideal behaviour is known as negative deviation from Raoult's law. Ex CHCl_3 and acetone, H_2O and HCl, H_2O and HNO_3 .

For negative deviation $\Delta H_{\text{mixing}} < 0$

Q5. A 5% solution of cane sugar in H_2O has freezing point of 271K. Calculate the freezing point of 5% glucose in H_2O if freezing point of pure water is 273.15K

Ans: 5% solution of cane sugar, means 5 g of sugar is present in 95g of water.

$$\Delta T_f = 273.15 - 271 = 2.15\text{K}$$

$$\Delta T_f = \frac{k_f \times W_B \times 1000}{M_B \times W_A}$$

$$2.15 = \frac{K_f \times 5 \times 1000}{342 \times 95}$$

$$2.15 = K_f \times 0.154 \text{-----I}$$

now for 5 g glucose

$$\Delta T_f = \frac{K_f \times 5}{180} \times \frac{1000}{95}$$

$$\Delta T_f = \frac{K_f \times 0.292}{2.15} \text{-----ii}$$

$$\text{I } 2.15 = K_f \times 0.154$$

$$\text{II } \Delta T_f = K_f \times 0.292$$

$$\Delta T_f = \frac{2.15 \times 0.292}{0.154} = 4.08 \text{ K}$$

Freezing point of solution

$$= 273.15 - 4.08 \text{ K} = 269.07 \text{ K}$$

Q6. The partial pressure of ethane over a saturated solution containing 6.56×10^{-2} g of ethane is 1 bar. If the solution contains 5×10^{-2} g of ethane, then what shall be the partial pressure of the gas?

Ans: $m = k p$

$$6.56 \times 10^{-2} = k \times 1 \text{-----I}$$

$$\text{and } 5 \times 10^{-2} = k p \text{-----II}$$

comparing equation I and II

$$\frac{6.56 \times 10^{-2}}{5 \times 10^{-2}} = \frac{k \times 1}{k \times p}$$

$$p = \frac{5}{6.56} = 0.76 \text{ bar}$$

Q7. Heptane and octane form ideal solution. At 373 K, the vapour pressures of the two liquid components are 105.2 k pa and 46.8 k pa respectively. What will be the vapour pressure in bar of a mixture of 25g of heptane and 35 g of octane.

Ans: Molar mass of Heptane = 100 g

Molar mass of octane = 114 g

$$\text{No. of moles of heptane} = \frac{25}{100} = \frac{1}{4} = 0.25 \text{ mole}$$

$$\text{No. of moles of octane} = \frac{35}{114} = 0.3070 \text{ mole}$$

$$\text{Mole fraction of heptane} = \frac{0.25}{0.25 + 0.307} = 0.446$$

$$\text{Mole fraction of octane} = \frac{0.307}{0.25 + 0.307} = 0.554$$

$$\text{Partial vapour pressure of heptane} = 0.446 \times 105.2 = 46.93 \text{ kPa}$$

$$\text{Partial vapour pressure of octane} = 0.544 \times 46.8 = 25.93 \text{ kPa}$$

$$\text{v.p of solution} = 46.93 + 25.93 = 72.8 \text{ kPa}$$

Q8. An antifreeze solution is prepared from 222.6 g of ethylene glycol and 200 g of water. Calculate the molality of the solution. If the density of the solution is 1.072 g mol^{-1} . What should be the molarity of the solution?

Ans: $m = \frac{W_B}{M_B} \times \frac{1000}{W_B \text{ in grams}}$

$$= \frac{222.6 \times 1000}{62 \times 200} = 17.95 \text{ mol / kg}$$

mass of solution = mass of solute + mass of solvent

$$= 222.6 + 200 = 422.6 \text{ g}$$

$$\text{volume} = \frac{\text{mass of solution}}{\text{density of solution}} = \frac{422.6}{1.072}$$

$$\text{Molarity (M)} = \frac{W_B \times 1000}{M_B \times \text{Volume of solution in ml}}$$

$$= \frac{222.6 \times 1000}{62 \times 394.2}$$

$$= 9.1076 \text{ mol/l}$$

Q9. Two elements A and B forms compounds having molecular formula AB_2 and AB_4 . When dissolved in 20g of Benzene, 1 g of AB_2 lowers the freezing point by 2.3 K, where as 1 g of AB_4 lowers the freezing point by 1.3 K. k_f benzene is $5.1 \text{ K kg mol}^{-1}$. calculate the atomic mass of A and B

Ans: $\Delta T_f = \frac{k_f \times W_B \times 1000}{M_B \times W_A \text{ for } AB_2}$

$$2.3 = \frac{5.1 \times 1 \times 1000}{M_B \times 20}$$

$$M_B = \frac{5.1 \times 1000}{2.3 \times 20}$$

$$= 110.86 \text{ g/mol}$$

for AB_4

$$1.3 = \frac{5.1 \times 1 \times 1000}{M_B \times 20}$$

$$M_B = \frac{5.1 \times 1000}{1.3 \times 20} = \frac{255}{1.3} = 196.15 \text{ g/mol}$$

for AB_2 $A+2B = 110.86$

for AB_4 $A+B_4 = 196.15$

$$-2B = -85.29$$

$$B = 42.64$$

$$A = 110.86 - 2 \times B$$

$$= 110.86 - 2 \times 42.64$$

$$= 25.58$$

Atomic mass of A 25.58 g / mol

B 42.64 g / mol

Q10. Calculate the % composition in terms of mass of a solution obtained by mixing 300 g of a 25% and 400 g of a 40% solution by mass

Ans: Mass of solute (1) = $\frac{300 \times 25}{100} = 75 \text{ g}$

Mass of solute (2) = $\frac{400 \times 40}{100} = 160 \text{ g}$

Total mass of solute = $75 + 160 = 235 \text{ g}$

Total mass of solution = $400 + 300 = 700 \text{ g}$

%mass = $\frac{\text{mass of solute} \times 100}{\text{mass of solution}}$

$$= \frac{235 \times 100}{700}$$

$$= 33.57\%$$

solvent = $100 - 33.57 = 66.43 \%$

Q11. An aqueous solution containing 1.248 g of BaCl₂ in 100g of water boils at 100.082° C. Calculate the degree of dissociation of Barium chloride. ($k_b = 0.52 \text{ K kg mol}^{-1}$)

$$\begin{aligned} \text{Ans: BaCl}_2 &\rightarrow \text{Ba}^{+2} + 2\text{Cl}^- \\ \Delta T_b &= 100.0832 - 100 \\ &= 0.0832^\circ \text{C} \\ \Delta T_b &= \frac{i \times k_b \times W_B \times 1000}{M_B \times W_A} \\ 0.0832 &= \frac{i \times 0.52 \times 1.248 \times 1000}{208.34 \times 100} \\ i &= \frac{0.0832 \times 208.34 \times 100}{0.52 \times 1.248 \times 1000} \\ &= 2.67 \\ \alpha &= \frac{i-1}{n-1} = \frac{2.67-1}{3-1} = \frac{1.67}{2} = 0.835 \\ \alpha &= 83.5\% \end{aligned}$$

Q12. The molal freezing point depression constant of benzene is 4.9 K kg mol⁻¹ selenium exist as a polymer of the type Se_x. When 3.26g of Se is dissolved in 226g of benzene, the observed freezing point is 0.112° C lower than for the benzene. What is the molecular formula of selenium? Atomic mass of Se = 78.8g/mol

$$\begin{aligned} \text{Ans: } k_f &= 4.9 \text{ K kg mol}^{-1} \\ m &= \frac{3.26 \times 1000}{226 \times 78.8} \\ \text{observed } \Delta T_f &= 0.112^\circ \text{C} \\ \Delta T_f \text{ theoretical} &= \frac{4.9 \times 3.26 \times 1000}{226 \times 78.8} \\ &= 0.896^\circ \text{C} \\ i &= \frac{0.896}{0.112} = 8 \\ \alpha_{\text{association}} &= 8 \quad \therefore \text{molecular formula} = \text{Se}_8 \end{aligned}$$

Q13. What is the molar concentration of solute particles in the human blood, if the osmotic pressure is 7.2 atm at the body temperature of 37° C?

(Hint: $\pi = CRT$)

UNI

SOLID

ASSERTION -REASON TYPE (1 mark question)

A statement of assertion is followed by a statement of reason. Mark the correct choice from the options given below:

- (a) Both assertion and reason are true and reason is the correct explanation of assertion.

- (b) Both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) Assertion is true but reason is false.
- (d) Both assertion and reason are false.

1. **Assertion :** In an ideal solution, $\Delta_{\text{mix}} H$ is zero.

Reason : In an ideal solution, A - B interactions are lower than A-A and B-B interactions.

2. **Assertion :** Osmosis does not take place in two isotonic solutions separated by semi-permeable membrane.

Reason : Isotonic solutions have same osmotic pressure.

3. **Assertion :** Lowering of vapour pressure is not dependent on the number of species present in the solution.

Reason : Lowering of vapour pressure and relative lowering of vapour pressure are colligative properties.

4. **Assertion :** When methyl alcohol is added to water, boiling point of water increases.

Reason : When a volatile solute is added to volatile solvent, elevation in boiling point is observed

5. **Assertion :** Two liquids nitric acid and water form a maximum boiling azeotrope when mixed in the ratio of 68% and 32% respectively.

Reason : Interaction between nitric acid and water are stronger than nitric acid - nitric acid interactions and water - water interactions.

Ans - 1(c), 2(a), 3(d), 4(d), 5(a)

(MULTIPLE CHOICE QUESTION)MCQ

1. **Which of the following units is useful in relating concentration of solution with its vapour pressure?**

- (i) mole fraction
- (ii) parts per million
- (iii) mass percentage
- (iv) molality

2. **On dissolving sugar in water at room temperature solution feels cool to touch. Under which of the following cases dissolution of sugar will be most rapid?**

- (i) Sugar crystals in cold water.
- (ii) Sugar crystals in hot water.
- (iii) Powdered sugar in cold water
- (iv) Powdered sugar in hot water.

3. **At equilibrium the rate of dissolution of a solid solute in a volatile liquid solvent is _____.**

- (i) less than the rate of crystallization
- (ii) greater than the rate of crystallisation

(iii) equal to the rate of crystallization

(iv) zero

4. A beaker contains a solution of substance 'A'. Precipitation of substance 'A' takes place when small amount of 'A' is added to the solution. The solution is_____.

(i) saturated

(ii) supersaturated

(iii) unsaturated

(iv) concentrated

5. Maximum amount of a solid solute that can be dissolved in a specified amount of a given liquid solvent does not depend upon_____.

(i) Temperature

(ii) Nature of solute

(iii) Pressure

(iv) Nature of solvent

6. Low concentration of oxygen in the blood and tissues of people living at high altitude is due to_____.

(i) low temperature

(ii) low atmospheric pressure

(iii) high atmospheric pressure

(iv) both low temperature and high atmospheric pressure

7. Considering the formation, breaking and strength of hydrogen bond, predict which of the following mixtures will show a positive deviation

from Raoult's law?

(i) Methanol and acetone.

(ii) Chloroform and acetone.

(iii) Nitric acid and water.

(iv) Phenol and aniline.

8. Colligative properties depend on_____.

(i) the nature of the solute particles dissolved in solution.

(ii) the number of solute particles in solution.

(iii) the physical properties of the solute particles dissolved in solution.

(iv) the nature of solvent particles.

9. The unit of ebullioscopic constant is_____.

(i) $K \text{ kg /mol or } K (\text{molality})^{-1}$

(ii) $\text{mol kg/ } K \text{ or } K^{-1}(\text{molality})$

(iii) $\text{kg mol}^{-1} K^{-1} \text{ or } K^{-1}(\text{molality})^{-1}$

(iv) $K \text{ mol kg}^{-1} \text{ or } K (\text{molality})$

10. An unripe mango placed in a concentrated salt solution to prepare pickle, shrivels because_____.

(i) it gains water due to osmosis.

(ii) it loses water due to reverse osmosis.

- (iii) it gains water due to reverse osmosis.
- (iv) it loses water due to osmosis.

11. At a given temperature, osmotic pressure of a concentrated solution of a substance_____.

- (i) is higher than that at a dilute solution.
- (ii) is lower than that of a dilute solution.
- (iii) is same as that of a dilute solution.
- (iv) cannot be compared with osmotic pressure of dilute solution.

12. Which of the following statements is false?

- (i) Units of atmospheric pressure and osmotic pressure are the same.
- (ii) In reverse osmosis, solvent molecules move through a semipermeable membrane from a region of lower concentration of solute to a region of higher concentration.
- (iii) The value of molal depression constant depends on nature of solvent.
- (iv) Relative lowering of vapour pressure, is a dimensionless quantity.

13. Value of Henry's constant K_H _____.

- (i) increases with increase in temperature.
- (ii) decreases with increase in temperature.
- (iii) remains constant.
- (iv) first increases then decreases.

14. The value of Henry's constant K_H is _____.

- (i) greater for gases with higher solubility.
- (ii) greater for gases with lower solubility.
- (iii) constant for all gases.
- (iv) not related to the solubility of gases.

15. If two liquids A and B form minimum boiling azeotrope at some specific composition then _____.

- (i) A–B interactions are stronger than those between A–A or B–B.
- (ii) vapour pressure of solution increases because more number of molecules of liquids A and B can escape from the solution.
- (iii) vapour pressure of solution decreases because less number of molecules of only one of the liquids escape from the solution.
- (iv) A–B interactions are weaker than those between A–A or B–B.

Ans:

1(i), 2(iv), 3 (iii), 4. (ii), [Hint : If added substance dissolves, the solution is unsaturated. If it does not dissolve solution is saturated. If precipitation occurs solution is supersaturated.] 5. (iii)
6. (ii), 7. (i), 8. (ii) 9. (i) 10. (iv) 11. (i)
12. (ii) 13. (ii) 14. (ii) 15(iv)

2 MARKS QUESTIONS

Q1. State Henry's law. What is the significance of KH?

Ans. Henry's Law: It states that "the partial pressure of the gas in vapour phase (p) is directly proportional to the mole fraction of the gas (x) in the solution", and is expressed as: $p = K_H \cdot x$ where, K_H is the Henry's Law constant. Significance of K_H : Higher the value of Henry's law constant, the lower is the solubility of the gas in the liquid.

Q2. How is that measurement of osmotic pressure is more widely used for determining molar masses of macro molecules than the elevation in boiling point or depression in freezing point of their solutions?

Ans. The osmotic pressure method has the advantage over elevation in boiling point or depression in freezing point for determining molar masses of macromolecules because

- Osmotic pressure is measured at the room temperature and the molarity of solution is used instead of molality.
- Compared to the colligative properties, its magnitude is large even for very dilute solutions.

Q3. When 1.5g of a non-volatile solute was dissolved in 90g of benzene, the boiling point of benzene raised from 353.23K to 353.93K. Calculate the molar mass of solute?

$$\Delta T_b = 353.93\text{K} - 353.23\text{K} \\ = 0.7\text{K}$$

$$W_B = 1.5\text{g}, W_A = 90\text{g}, \Delta T_b = 0.7\text{K}, K_b = 2.52\text{Kkg/mol}$$

$$M_B = \frac{K_b \cdot W_B \cdot 1000}{\Delta T_b \cdot W_A}$$

$$= \frac{2.52 \times 1.5 \times 1000}{0.7 \times 90}$$

$$= 60\text{g/mol}$$

Q4. Suggest the most important type of intermolecular interaction in the following pairs:

- N-hexane and n-octane
- methanol and acetone

Ans. i) Dispersion or London forces as both are non-polar.

ii) Dipole-dipole interactions as both are polar molecules.

Q5. Calculate the mass percentage of aspirin($C_9H_8O_4$)in acetonitrile (CH_3CN) when 6.5g of $C_9H_8O_4$ is dissolved in 450g of CH_3CN .

Ans. Mass of solution=6.5g+450g=456.5g

$$\frac{\text{Mass of aspirin} \times 100}{\text{Mass of solution}}$$
$$= 6.5/456.5 \times 100 = 1.424\%$$

3 MARKS QUESTIONS

Q1. a) **Why is an increase in temperature observed on mixing chloroform and acetone?**

b) Why does sodium chloride solution freeze at a lower temperature than water?

Ans: a) The bonds between chloroform molecules and molecules of acetone are dipole-dipole interactions but on mixing, the chloroform and acetone molecules, they start forming hydrogen bonds which are stronger bonds resulting in their release of energy. This gives rise to an increase in temperature.

b) When a non-volatile solute is dissolved in a solvent, the vapour pressure decreases. As a result, the solvent freezes at a lower temperature.

Q2. A solution of glycerol ($C_3H_8O_3$) in water was prepared by dissolving some glycerol in 500g of water. This solution has a boiling point of

100.42°C while pure water boils at 100°C. What mass of glycerol was dissolved to make the solution? (K_b of water = 0.512 K kg/mol)

Ans. $\Delta T_b = 100.42^\circ C - 100^\circ C = 0.42^\circ C$ or $0.42 K$; $W_A = 500 g$; $K_b = 0.512$
K kg / mol ;

$M_B = 92 g/mol$ Substituting these values in the expressions,

$$W_B = \frac{\Delta T_b \times M_B \times W_A}{K_b \times 1000}$$

$$W_B = \frac{0.42 \times 92 \times 500 = 37.73 \text{ g}}{0.512 \times 1000}$$

- Q3. The molar freezing point depression constant for benzene is $4.90 \text{ K kg mol}^{-1}$. Selenium exists as polymer Se_x . When 3.26 gm of Se is dissolved in 226gm of benzene, the observed freezing point is 0.112°C lower than for pure benzene. Decide the molecular formula of Selenium. (At.wt. of selenium is 78.8 g mol^{-1})

$$\text{Ans T } \frac{1000 \times K_f \times W_B}{M_B} = \frac{W_A \times M_B}{M_A}$$

$$\frac{0.112 \text{ K} = 1000 \times 4.9 \times 3.26}{226 \times M_B}$$

$$M_B = 1000 \times 4.90 \times 3.26 / 226 \times 0.112 = 636 \text{ g/mol}$$

No. of Se atoms in a molecule = $636 \text{ g/mol} / 78.8 \text{ g/mol} = 8.07 \sim 8$ Therefore, molecular formula of Selenium = Se_8

5 MARKS QUESTION

- Q1. a) State Raoult's Law for a solution containing volatile components.

How does Raoult's law become a special case of Henry's Law?

- b) 1.00 g of a non electrolyte solute dissolved in 50 g of benzene lowered the freezing point of a benzene by 0.40 K. Find the molar mass of the solute. (Kf for benzene = $5.12 \text{ K kg mol}^{-1}$)

Ans. a) For a solution of volatile liquids, Raoult's law states that the partial vapour pressure of each component of the solution is directly proportional to its mole fraction present in solution, i.e., $p_A = x_A p_A^0$

OR

$$p_A = x_A p_A^0$$

According to Henry's Law, the partial pressure of a gas in vapour phase (p_A) is directly proportional to mole fraction (x) of the gas in the solution.

i.e., $p = K_H x$ on comparing it with Raoult's Law it can be seen that partial pressure of the volatile component or gas is directly proportional to its mole fraction in solution

i.e; $p \propto x$

only the proportionality constant K differs from P°_A . Thus, it becomes a special case of

Henry's law in which $K_H = P^{\circ}_A$

- b) Substituting the values of various terms involved in equation

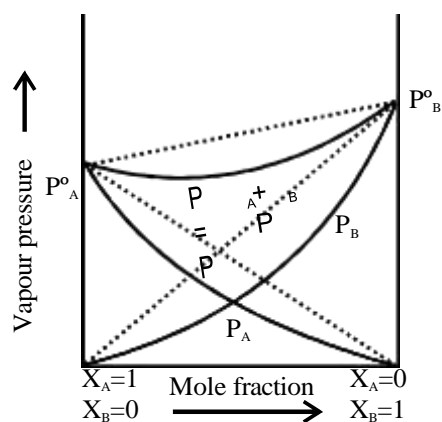
$$M_B = \frac{K_f \times W_B \times 1000}{\Delta T_f \times W_A}$$

$$M_B = \frac{5.12 \times 1.0 \times 1000}{0.40 \times 50}$$

$$= 256 \text{ g/mol}$$

Q2. a) Calculate the molarity of a sulphuric acid solution in which the mole fraction of water is 0.85.

- b) The graphical representation of vapour pressure of two component system as a function of composition is given alongside.
- Are the A – B interactions weaker, stronger or of the same magnitude as A – A and B – B
 - Name the type of deviation shown by this system from Raoult's law.
 - Predict the sign of $\Delta_{\text{mix}}H$ for this system.
 - Predict the sign of $\Delta_{\text{mix}}V$ for this system.
 - Give an example of such a system.
 - What type of a zeotrope will this system form, if possible ?



P-X graph for non-ideal solution showing -ve deviation

Ans-

a) $n_A/n_{A+n_B} = 0.85 \dots\dots(i)$

$$n_B/n_{A+n_B} = 1-0.85$$

$$= 0.15 \dots\dots(ii)$$

Dividing (ii) by (i)

$$n_B/n_A = 0.15/0.85 \quad n_B =$$

$$0.15/0.85 \times n_A$$

$$= 0.15/0.85 \times 1000/18$$

$$= 9.8m$$

b) i) Stronger ii) Negative deviation iii) Negative

iv) Negative v) 20% acetone and 80% chloroform by mass

vi) maximum boiling azeotrope

ASSIGNMENT

Q1. Define mole fraction

Q2. What type of intermolecular attractive interaction exists in the pair of methanol and acetone?

Q3. What do you understand by "colligative properties" ?

Q4. Why is the vapour pressure of a solution of glucose in water lower than that of water?

Q5. State any two characteristics of ideal solutions.

Q6. Some liquids on mixing form "azeotropes". What are azeotropes ? Q7. Define molal elevation constant or ebullioscopic constant .

Q8. What is "reverse osmosis" ?

Q9. Derive an equation to express that relative lowering of vapour pressure for a solution is equal to the mole fraction of the solute in it when the solvent alone is volatile.

Q10. State Raoult's law for the solution containing volatile components. What is the similarity between Raoult's law and Henry's law ?

Q11. Boiling point of water at 750 mm Hg is 99.63°C. How much sucrose is to be added to 500g of water such that it boils at 100°C ?

Q12. 18 g of glucose, $C_6H_{12}O_6$ (Molar Mass = 180 g mol^{-1}) is dissolved in

1 kg of water in a sauce pan. At what temperature will this solution boil ?

(K_b for water = $0.52 \text{ K kg mol}^{-1}$, boiling point of pure water = 373.15 K)

- Q13. After removing the outer shell of the two eggs in dil. HCl, one is placed in distilled water and the other in a saturated solution of NaCl . What will you observe and why ?
- Q14. Heptane and octane form an ideal solution. At 373 K, the vapour pressures of the two liquid components are 105.2 kPa and 46.8 kPa, respectively. What will be the vapour pressure of a mixture of 26.0g of heptane and 35.0 g of octane ?

SOLID STATE

- Some glass objects from ancient civilizations are found to become milky in appearance. Why?
- What are pseudo solids or super cooled liquids? Give examples.
- Glass panes fixed to windows or doors of old buildings are invariably found to be slightly thicker at the bottom than at the top. Give reason.
- Crystalline solids are anisotropic in nature. Why?
- Amorphous solids are isotropic in nature. Why?
- Show that the efficiency of packing in BCC is 68%
- An element has a bcc structure with a cell edge of 288 pm. The density of the element is 7.2 g/cm^3 . How many atoms are present in 208 g of the element? (Ans: 24.16×10^{23} atoms)
- Silver forms ccp lattice and X-ray studies of its crystals. Show that the edge length of its unit cell is 408.6 pm. Calculate the density of silver. (Atomic mass of Ag is 107.9 u.) (Ans: $10.5 \times 10^3 \text{ kg m}^{-3}$)
- An element with molar mass $2.7 \times 10^{-2} \text{ kg mol}^{-1}$ forms a cubic unit cell with edge length 405 pm. If its density is $2.7 \times 10^3 \text{ kg}^{-3}$, what is the nature of the unit cell? (Z = 4. fcc)
- Which point defect lowers the density of ionic crystals?
- Why Frenkel defect does not change the density of AgBr crystal?
- Why is Frenkel defect not found in pure alkali metal halides?
- What is the effect of Frenkel defect on the electrical conductance of a crystalline solid?
- What may be the difference between phosphorous doped and gallium doped semi-conductors?
- What structural changes will occur if sodium chloride crystal is subjected to high pressure?
- What happens to the structure of CsCl when it is heated to 760K?
- Name the compound in which both Schottky and Frenkel defects are present together?
- What are 12-16 and 13-15 compounds? Give examples. Mention one use of each.
- What is the effect of presence of schottky defect on the density of crystal?
- What is the effect of increasing temperature on the conductivity of semi conductors?
- Show that the efficiency of packing in FCC is 74%
- How many atoms are there in a unit cell of a metal crystallizing in fcc structure?
- Account for: Silicon is an insulator but silicon doped with phosphorous acts as semi conductor.
- What other element may be added to silicon to make electrons available for conduction of an electric current?
- If NaCl crystals are doped with $2 \times 10^{-3} \text{ mol\%}$ of SrCl_2 , calculate the cation vacancies per mole. ($N_A = 6.022 \times 10^{23} \text{ mol}^{-1}$) (Ans: 12.04×10^{18})
- What is the difference between ferromagnetic and ferrimagnetic substances? Give examples
- Mention one property which is caused due to the presence of F-centres in a solid.
- If the radius of the octahedral void is r and radius of the atoms in close packing is R, derive the relation between r and R.
- In corundum, oxide ions are arranged in hcp arrangement and the aluminium ions occupy 2/3 of the octahedral voids. What is the formula of corundum?
- What are f-centres?
- Why is KCl imparting violet colour when it is heated in the presence of K vapours?
- What is the defect called when ionic substance is heated in the presence of corresponding metal vapour or when a metal ion occupy interstitial sites?
- What are valence band and conduction band? How are they related to conductivity of solid substances?
- Derive the following for solid substances:

$$d = Z \times M / a^3 \times N_A$$
- Bring out the difference between amorphous and crystalline solids?

SOLUTIONS (WORK SHEET)

- When is the value of Van't Hoff factor more than one?
- What kind of deviation is shown by a solution of acetone and CS_2 ?
- What is the expected Van't Hoff factor for $\text{K}_3[\text{Fe}(\text{CN})_6]$
- Suppose a solid solution is formed between two substances, one whose particles are very large and the other whose particles are very small. What type of solid solution is this likely to be?
- Molar mass of polymers (macro molecules) can be determined by osmotic pressure but not by other Colligative properties. Explain?

21. Why is CaCl_2 used to remove snow on roads?
22. What is Henry's law? Give some important applications of Henry's law.
23. What would be the value of 'i' if solute molecules undergo association in solutions?
24. Two liquids A and B have boiling point 100°C and 120°C respectively. Which of them would show higher vapour pressure?
25. The osmotic pressure of 1.M sodium chloride solution is twice that of 1M glucose solution. Give reason.
11. What is the effect of temp on vapour pressure of liquid?
12. Give one practical application of depression of freezing point?
13. State Raoult's law? Why is vapour pressure of a solvent lowered by the addition of non-volatile solute?
A solution containing 18 gm of a non volatile solute in 200 gm of water freezes at 272.07 K . calculate the molecular mass of the solute. (Given: $K_f = 1.86\text{ k/m}$) (Ans= 180 gm/mol.)
14. Concentrated sulphuric acid has a density of 1.9 g/ml and is 99% by weight. Calculate the molarity of H_2SO_4 in this acid. (Ans = $18.3116\text{ mol L}^{-1}$)
15. At 298 K , 100 cm^3 of a solution containing 3.02 g of an unidentified solute exhibits an osmotic pressure of 2.55 atmospheres. What is the molecular mass of solute? ($R = 0.0821\text{ L atm mol}^{-1}\text{ K}^{-1}$) (Ans = $M = 287.7\text{ g/mol}$)
16. Define vapour pressure of a liquid. What happens to the vapour pressure when
(a) a volatile solute dissolves in the liquid and (b) the dissolved solute is non-volatile?
17. What type of deviation (positive or negative) from ideal behaviour will be shown by the solution of cyclohexane and ethanol? Give suitable reason.
18. Two liquids X and Y on mixing form an ideal solution. At 30°C , the vapour pressure of the solution of the containing 3 mol of X and 1 mol of Y is 550 mm Hg . But when 4 mol of X and 1 mol of Y are mixed, the vapour pressure of the solution thus formed is 560 mm Hg . What would be vapour pressure of pure X and Y at this temperature? (Ans: $600,400\text{ mm Hg}$)
19. With the help of suitable diagrams, illustrate the two types of non-ideal solutions.
20. Illustrate elevation in boiling point with the help of vapour pressure - temperature curve of a solution. Show that elevation in boiling point is a colligative property.
21. Calculate the molarity and molality of a 13% slution (by weight) of sulphuric acid ? Its density is 1.020 g cm^{-3} . (Ans: $1.35\text{M}, 1.52\text{m}$)
22. Give an example of a compound in which hydrogen bonding results in the formation of a dimer.
23. On dissolving 3.24 gm of sulphur in 40 gm of benzene, boiling point of solution was higher than that of benzene by 0.81K . K_b value for benzene is 2.53 K Kg/ mol . What is the molecular formula of sulphur? (Atomic Mass of sulphur is 32) (Ans: S_8)
24. With the help of a suitable diagram, show that the lower vapour pressure of a solution than the pure solvent, causes a lowering of freezing point for the solution compared to that of the pure solvent.
25. Carbon tetrachloride and water are immiscible while ethyl alcohol and water are miscible in all proportions. Correlate the above behaviour with structural nature of molecules of these compounds
26. Show graphically how the vapour pressure of a solvent and a solution in it of a non-volatile solute change with temperature. Show on this graph the boiling points of the solvent and the solution. Which is higher and why?
A solution containing 3.1 gm of BaCl_2 in 250 gm of water boils at 100.083°C . Calculate the value of Van't Hoff factor and molality of BaCl_2 in this solution. (K_b for water is 0.52 K kg/mol , molar mass of BaCl_2 is 208.3 g/mol) (Ans: $m = 0.0595\text{ m}$ and $i = 2.68$)
27. Draw a suitable labeled diagram to express the relationships for ideal solutions of A and B between vapour pressures and mole fractions of components at constant temperature
28. How is the relative lowering of vapour pressure defined for a solution consisting of a volatile solvent and a non volatile solute? How is this function related to the mole fractions of the solvent and of the solute?
29. Two liquids X and Y boil at 110°C and 130°C respectively at atmosphere pressure. Which of them is expected to have a higher vapour pressure at 50°C ?
30. What are non ideal solutions? Explain as to why non ideal solutions deviate from Raoult's Law.
31. On mixing equal volume of water and ethanol, what type of deviation would you expect from Raoult's Law?
32. Two elements A and B form compounds having molecular formula AB_2 and AB_4 , when dissolved in 20 gm of benzene, 1 gm of AB_2 lowers the freezing point by 2.3K , whereas 1 gm of AB_4 lowers it by 1.3K . The molar depression constant for benzene is 5.1 K kg/mol . Calculate the atomic masses of A and B. [Ans: $A=25.89, B=42.64$]
33. How is the molality of a solution different from its molarity?

- 34 2 gm of C_6H_5COOH dissolved in 25 gm of benzene shows a depression in freezing point equal to 1.62 K. molar depression constant for benzene is 4.9 K kg/mol. What is the percentage association of acid if it forms double molecules (dimer) in solution? (Ans: 99.2%)

**KENDRIYA VIDYALAYA
MALLESWARAM, BENGALURU - 55**

TEST FOR PRACTICE

Class: XII

Sub: Chemistry

Max. Marks: 50 Marks

Time: 1 hr. 30 min.

Answer the following:

SECTION - I

(5 X 1M = 5M)

1. What are F-centres?
2. What are pseudo solids or super cooled liquids?
3. Why Frenkel defect does not change the density of AgBr crystal?
4. State Henry's law?
5. Define mole fraction of a solute?

SECTION - II

(6 X 2M = 12M)

6. Define lowering of vapour pressure? Why vapour pressure of a solution decreases on adding a non-volatile solute added to it?
7. Suggest the type of intermolecular attractive interactions in the following pairs:
(a) n-hexane and n-octane (b) $NaClO_4$ and H_2O
(c) Methanol and acetone (d) acetonitrile and acetone
8. Show that the packing efficiency in the compound having FCC structure is 74%
9. State two conditions how a solution behaves as non-ideal solution?
10. Give any two methods to increase the conductivity of semi conductors ?
11. What type of deviation from ideal behaviour will be shown by a solution of ethyl alcohol and water? Explain

SECTION - III

(6 X 3M = 18M)

12. Show that the efficiency of packing in BCC is 68%
13. Concentrated nitric acid is 68% nitric acid by mass in aqueous solution. what would be the molarity of such a sample of the acid if the density of the solution is 1.504 g mL^{-1}
- 14.(a) Write any two differences between Schottky defect and Frenkel defect
(b) Classify each of the following as being either a p-type or n-type semiconductor:
(i) Ge doped with Tl (ii) Al doped with Si

15. What type of solution does a solution containing nitric acid and water shows? Explain with graph.
16. An element has a bcc structure with a cell edge of 288 pm. The density of the element is 7.2 g/cm³. How many atoms are present in 208 g. of the element?
17. Aluminium crystallizes in a cubic close packed structure. Its metallic radius is 125 pm. Calculate (i) the length of the side of the unit cell and (ii) how many unit cells are there in 1.0 cm³ of aluminium.

SECTION – IV

(3 X 5M = 15M)

- 18.(a) Draw a suitable labeled diagram to express the relationship for ideal solution of binary solutions between vapour pressure and mole fraction of components at constant temperature.
(b) Determine the amount of CaCl₂ (*i*=2.47) dissolved in 2.5 litre of water such that its osmotic pressure is 0.75 atm at 27⁰c.
19. A solution containing 30 g. of a non-volatile solute exactly in 90 g. of water has a vapour pressure of 2.8 kPa at 298 K. Further, 18 g. of water is then added to the solution and the new vapour pressure becomes 2.9 kPa at 298 K. Calculate (i) molar mass of the solute and (ii) vapour pressure of water at 298 K.
20. Heptane and Octane form an ideal solution. At 373 K, the vapour pressure of two liquid components are 105.2 kPa and 46.8 kPa respectively. What will be the vapour pressure of a mixture of 26.0 g. of Heptane and 35 g. of Octane?

Subject: Physics

1. Conceptual Questions from Electrostatics
2. Skill based questions from Electrostatics.
3. Investigatory project
4. Record work

Subject: Biology

PREVIOUS YEARS BOARD QUESTIONS-UNIT 1

1. Why do moss plants produce very large number of male gametes ? Provide one reason. What are these gametes called?
2. State what is apomixis. Comment on its significance. How can it be commercially used?
3. Your school has been selected by the Department of Education to organize and host an interschool seminar on “Reproductive Health – Problems and Practices”. However, many parents are reluctant to permit their wards to attend it. Their argument is that the topic is “too embarrassing.”
4. Put forth four arguments with appropriate reasons and explanation to justify the topic to be very essential and timely.

- (a) Plan an experiment and prepare a flow chart of the steps that you would follow to ensure that the seeds are formed only from the desired sets of pollen grains. Name the type of experiment that you carried out.
- (b) Write the importance of such experiments.
5. Describe the roles of pituitary and ovarian hormones during the menstrual cycle in a human female.
6. Name the type of asexual reproduction where the parent cell ceases to exist.
7. Differentiate between pericarp and perisperm.
8. Name the male accessory glands in humans and write their functions.
- (a) Name a terminal method to prevent pregnancy in humans.
- (b) Describe the procedure of the terminal method carried in human male and female.
9. a) Do all pollen grains remain viable for the same length of time ? Support your answer with two suitable examples.
- (b) How are pollen grains stored in pollen banks ? State the purpose of storing pollen grains in these banks.
- 10 (a) Draw a labelled diagram of a human blastocyst.
- (b) What is parturition and how is it induced at the end of pregnancy in a human female ?
- 11 (a) With labelled diagrams, depict stages in embryo development in a dicotyledenous plant.
- (b) Endosperm development precedes embryo development. Why ?
- 12 Our government has intentionally imposed strict conditions for M.T.P. in our country. Justify giving a reason.
- 13 A mature embryo-sac in a flowering plant may possess 7-cells, but 8-nuclei. Explain with the help of a diagram only.
- 14 (a) List the three stages the annuals and biennial angiosperms have to pass through during their life cycle.
- (b) List and describe any two vegetative propagules in flowering plants.
- 15 Draw a labelled diagrammatic sectional view of a human seminiferous tubule.
- 16 Read the following statement and answer the questions that follow :
- “A guava fruit has 200 viable seeds.”
- (a) What are viable seeds ?
- (b) Write the total number of:
- (i) Pollen grains
- (ii) Gametes in producing 200 viable guava seeds.
- (c) Prepare a flow-chart to depict the post-pollination events leading to viable-seed production in a flowering plant.
- 17 (a) Arrange the following hormones in sequence of their secretion in a pregnant woman.
- (b) Mention their source and the function they perform: hCG ; LH ; FSH ; Relaxin
- In a flowering plant a microspore mother cell produce four male gametophytes while a megaspore mother cell form only one female gametophyte. Explain.
- 18 Some flowers, selected for artificial hybridization, do not require emasculation but bagging is essential for them. Give a reason
- 19 Write any two ways by which apomictic seeds may be developed in angiosperms.
- 20 Draw a labelled diagram of a mature male gametophyte of an angiosperm.
- 21 Draw a diagram of L.S. of an embryo of grass and label any six parts.
22. Explain the events that occur in the uterus during menstrual cycle in the human females.
23. Explain the post pollination events up to double fertilisation, that occur in an angiosperm
24. A pollen grain in angiosperm at the time of dehiscence from an anther could be 2-celled or 3-celled. Explain. How are the cells placed within the pollen grain when shed at a 2-celled stage ?
25. (a) Explain the following phases in the menstrual cycle of a human female:
- (i) Menstrual phase
- (ii) Follicular phase
- (iii) Luteal phase

- (b) A proper understanding of menstrual cycle can help immensely in family planning. Do you agree with the statement? Provide reasons for your answer.
26. How does an encysted Amoeba reproduce on return of favourable conditions?
27. What are gemmules and conidia? Name one organism each in which these are formed?
28. Name any two copper releasing IUD's. State how they act as a contraceptive.
29. Draw a well-labelled diagram of L.S of a pistil of a flower showing the passage of growing of pollen tube up to its destination.
30. Can a plant flowering in Mumbai be pollinated by pollen grains of the same species growing in New Delhi ? Provide explanations to your answer.
31. Name the type of cell division that takes place in the zygote of an organism exhibiting haplontic life cycle.
32. Differentiate between albuminous and non-albuminous seeds, giving one example of each.
33. Write the specific location and the functions of the following cells in human males :
- Leydig cells
 - Sertoli cells
 - Primary spermatocyte
34. Name the embryonic stage that gets implanted in the uterine wall of a human female. Differentiate between ZIFT and ET
35. Describe the Lactational Amenorrhea method of birth control.
36. Give reasons why :
- most zygotes in angiosperms divide only after certain amount of endosperm is formed.
 - groundnut seeds are exalbuminous and castor seeds are albuminous.
 - Micropyle remains as a small pore in the seed coat of a seed.
 - integuments of an ovule harden and the water content is highly reduced, as the seed matures.
 - apple and cashew are not called true fruits.
 - Anthers of angiosperm flowers are described as ditheous.
 - Hybrid seeds have to be produced year after year.

Subject: Computer Science

CHAPTER 1 & 2 : PYTHON REVISION TOUR I & II

Q 1. Find error in the following code (if any) and correct code by rewriting code and underline the correction:-

```
x= int("Enter value of x:")
for in range [0,10]:
    if x=y
        print( x+y)
    else:
        Print( x-y)
```

Q 2. Rewrite the following program after finding and correcting syntactical errors and underlining it.

```
a,b = 0
if (a = b)
a +b = c
print( z)
```

Q 3. Rewrite the following code in python after removing all syntax error(s). Underline each correction done in the code.

```

250 = Number
WHILE Number<=1000:
    if Number=>750
        print (Number)
    Number=Number+100
else
print( Number*2)
    Number=Number+50

```

Q 4. Rewrite the following code in python after removing all syntax error(s). Underline each correction done in the code.

```

Val = int(rawinput("Value:"))
Adder = 0
for C in range(1,Val,3)
    Adder+=C
    if C%2=0:
        Print (C*10)
    Else:
        print (C*)
print (Adder)

```

Q5. Rewrite the following code in python after removing all syntax error(s). Underline each correction done in the code.

```

25=Val
for I in the range(0,Val)
    if I%2==0:
        print( I+1)
    Else:
        print (I-1)

```

Q6. Rewrite the following code in python after removing all syntax error(s). Underline each correction done in the code.

```

STRING=""WELCOME
NOTE""
for S in range[0,8]:
    print (STRING(S))

```

Q 7. Rewrite the following code in python after removing all syntax error(s). Underline each correction done in the code.

```

a=int{ input("ENTER FIRST NUMBER")}
b=int(input("ENTER SECOND NUMBER"))
c=int(input("ENTER THIRD NUMBER"))
if a>b and a>c
    print("A IS GREATER")
if b>a and b>c:
    Print(" B IS GREATER")
if c>a and c>b:
    print(C IS GREATER)

```


Q 8. Rewrite the following code in python after removing all syntax error(s). Underline each correction done in the code.

```
i==1
a=int(input("ENTER FIRST NUMBER"))
FOR i in range[1,11];
    print(a,"*=",i,"=",a*i)
```

Q. 9 Rewrite the following code in python after removing all syntax error(s). Underline each correction done in the code.

```
a="1"
while a>=10:
    print("Value of a=",a)
    a+=1
```

Q 10. Rewrite the following code in python after removing all syntax error(s). Underline each correction done in the code.

```
Num=int(rawinput("Number:"))
sum=0
for i in range(10,Num,3)
    Sum+=1
    if i%2=0:
        print(i*2)
    Else:
        print(i*3 print Sum)
```

Q 11. Write the module(s) that will be required to be imported to execute the following code in Python.

```
for i in range (len(string) ):
    if string [i] == ' '
        print
    else:
        c=string[i].upper()
        print( "string is:",c)
print ("String length=",len(math.floor()))
```

Q 12. Rewrite the following code in python after removing all syntax error(s). Underline each correction done in the code:-

```
x=integer(input('Enter 1 or 10'))
if x==1:
for x in range(1,11)
    Print(x)
Else:
    for x in range(10,0,-1):
        print(x)
```

Q 13 Rewrite the following code in python after removing all syntax error(s). Underline each correction done in the code.

```
30=To
for K in range(0,To) IF k%4==0:
print (K*4) Else:
print (K+3)
```

OUTPUT BASED QUESTIONS

Q1 Find output generated by the following code:

```
p=10
q=20
p*=q//3
q+=p=q**2
print(p,q)
```

Q2 Find output generated by the following code:

```
String Str="Computer"
Str[-4:]
Str*2
```

Q3 Find out the output of the Following –

```
x=20
x=x+5
x=x-10
print (x)
x,y=x-1,50
print (x,y)
```

Q4 Find out the output of the Following:

```
for a in range(3,10,3):
    for b in range(1,a,2):
        print(b, end=' ')
print ()
```

Q5 Find out the output of the Following:

```
x=10
y=5
for i in range(x-y*2):
    print("%",i)
```

Q6. Find output

```
x="one"
y="two"
c=0
while c<len(x):
    print(x[c],y[c])
    c=c+1
```

Q 7: Find out the output of the Following –

```
for i in range(-1,7,2):
    for j in range(3):
        print(i,j)
```

Q 8: Find out the output of the Following –

```
string="aabbcc"
```

```
count=3
```

```
while True:
```

```
    if string[0]=='a':
```

```
        string=string[2:]
```

```
    elif string[-1]=='b':
```

```
        string=string[:2]
```

```
    else:
```

```
        count+=1
```

```
        break
```

```
print(string)
```

```
print(count)
```

Q9: Find out the output of the Following :

```
x="hello world"
```

```
print(x[:2],x[:-2],x[-2:])
```

```
print(x[6],x[2:4])
```

```
print(x[2:-3],x[-4:-2])
```

Q 10. Find and write the output of the following python code :

```
Msg1="WeLcOME"
```

```
Msg2="GUeSTs"
```

```
Msg3=""
```

```
for I in range(0,len(Msg2)+1):
```

```
    if Msg1[I]>="A" and Msg1[I]<="M":
```

```
        Msg3=Msg3+Msg1[I]
```

```
    elif Msg1[I]>="N" and Msg1[I]<="Z":
```

```
        Msg3=Msg3+Msg2[I]
```

```
    else:
```

```
        Msg3=Msg3+"*"
```

```
print Msg3
```

Q 11. Find and write the output of the following python code:

```
Data = ["P",20,"R",10,"S",30]
```

```
Times = 0
```

```
Alpha = ""
```

```
Add = 0
```

```
for C in range(1,6,2):
```

```
    Times= Times + C
```

```
    Alpha= Alpha + Data[C-1]+"$"
```

```
    Add = Add + Data[C]
```

```
print (Times,Add,Alpha)
```

Q12. Find and write the output of the following python code:

```
Text1="AISSCE 2018"
```

```
Text2=""
```

```
I=0
```

```
while I<len(Text1):
```

```
    if Text1[I]>="0" and Text1[I]<="9":
```

```
        Val = int(Text1[I])
```

```

    Val = Val + 1
    Text2=Text2 + str(Val)
elif Text1[I]>="A" and Text1[I] <="Z":
    Text2=Text2 + (Text1[I+1])
else:
    Text2=Text2 + "*"
    I=I+1
print Text2

```

Q13. Find and write the output of the following python code:

```

TXT = ["20","50","30","40"]
CNT = 3
TOTAL = 0
for C in [7,5,4,6]:
    T = TXT[CNT]
    TOTAL = float (T) + C
    print TOTAL
    CNT-=1

```

Q14 Write the output:-

```

line = "I'll come by then."
eline = ""
for i in line:
    eline += chr(ord(i)+3)
print(eline)

```

Q 15 Write the output:-

```

line = "What will have so will"
L = line.split('a')
for i in L:
    print(i, end=' ')

```

Q 16 Find output:-

```

p=5/2
q=p*4
r=p+q
p+=p+q+r
q-=p+q*r
print(p,q,r)

```

Q 17 find output:-

```

a=(2+3)**3-6/2
b=(2+3)*5//4+(4+6)/2
c=12+(3*4-6)/3
d=12%5*3+(2*6)//4
print(a,b,c,d)

```

Q 18. Find the output of the following:

```

Moves=[11, 22, 33, 44]

```

```

Queen=Moves
Moves[2]+=22
L=Len(Moves)
for i in range (L)
    print ("Now@", Queen[L-i-1], "#", Moves [i])

```

Q 19.. Find the output of the following

```
L1 = [100,900,300,400,500]
```

```
START = 1
```

```
SUM = 0
```

```

for C in range(START,4):
    SUM = SUM + L1[C]
    print(C, ":", SUM)
    SUM = SUM + L1[0]*10
print(SUM)

```

Q 20: Find the output of following codes

1.

```
t1=("sun","mon","tue","wed")
print(t1[-1])
```

2.

```
t2=("sun","mon","tue","wed","thru","fri")
for i in range (-6,2):
    print(t2[i])
```

3.

```
t3=("sun","mon","tue","wed","thru","fri")
if "sun" in t3:
    for i in range (0,3):
        print(t2[i])
else:
    for i in range (3,6):
        print(t2[i])
```

4.

```
t4=("sun","mon","tue","wed","thru","fri")
if "sun" not in t4:
    for i in range (0,3):
        print(t4[i])
else:
    for i in range (3,6):
        print(t4[i])
```

5.

```
t5=("sun",2,"tue",4,"thru",5)
if "sun" not in t4:
    for i in range (0,3):
        print(t5[i])
else:
    for i in range (3,6):
        print(t5[i])
```

6.

```
t6=('a','b')
t7=('p','q')
```

```
t8=t6+t7
print(t8*2)
```

```
7. t9=('a','b')
t10=('p','q')
t11=t9+t10
print(len(t11*2))
```

```
8. t12=('a','e','i','o','u')
p,q,r,s,t=t12
print("p= ",p)
print("s= ",s)
print("s + p", s + p)
```

```
9. t13=(10,20,30,40,50,60,70,80)
t14=(90,100,110,120)
t15=t13+t14
print(t15[0:12:3])
```

Q21 Give the output of the following code:-

```
list=['p','r','o','b','l','e','m']
list[1:3]=[]
print(list)
list[2:5]=[]
print(list)
```

Q 22. Give the output of the following code:-

```
l1=[13,18,11,16,13,18,13]
print(l1.index(18))
print(l1.count(18))
l1.append(l1.count(13))
print(l1)
```

Q 23. What will be the output?

```
d1={"john":40, "peter":45}
d2={"john":466, "peter":45}
print(d1 > d2)
```

- a) TRUE
- b) FALSE
- c) ERROR
- d) NONE

Q 24. What Will Be The Output Of The Following Code Snippet?

```
fruit_list1 = ['Apple', 'Berry', 'Cherry', 'Papaya']
fruit_list2 = fruit_list1
fruit_list3 = fruit_list1[:]
fruit_list2[0] = 'Guava'
fruit_list3[1] = 'Kiwi'
sum = 0
```

```
for ls in (fruit_list1, fruit_list2, fruit_list3):
    if ls[0] == 'Guava':
        sum += 1
    if ls[1] == 'Kiwi':
        sum += 20
print (sum)
```

- A. 22
- B. 21
- C. 0
- D. 43

Q 25. What Will Be The Output Of The Following Code Snippet?

```
a = {(1,2):1,(2,3):2}
print(a[1,2])
```

- A. Key Error
- B. 1
- C. {(2,3):2}
- D. {(1,2):1}

Q26. What Will Be The Output Of The Following Code Snippet?

```
my_dict = {}
my_dict[1] = 11
my_dict['1'] = 23
my_dict[1.0] = 40
sum = 0
for k in my_dict:
    sum += my_dict[k]
print (sum)
```

Q27. What Will Be The Output Of The Following Code Snippet?

```
my_dict = {}
my_dict[(1,2,4)] = 8
my_dict[(4,2,1)] = 10
my_dict[(1,2)] = 12
sum = 0
for k in my_dict:
    sum += my_dict[k]
```

```
print (sum)
print(my_dict)
```

- A. Syntax error
- B. 30
{(1, 2): 12, (4, 2, 1): 10, (1, 2, 4): 8}
- C. 47
{(1, 2): 12, (4, 2, 1): 10, (1, 2, 4): 8}
- D. 30
{[1, 2]: 12, [4, 2, 1]: 10, [1, 2, 4]: 8}

Subject: Informatics Practices

TOPIC: SQL COMMANDS AND QUERIES

Ques:1 Write SQL command to create given tables.

DEPT TABLE

Column Name	Type	SIZ E	Constraint
DEPTNO	INTEGE R		PRIMARY KEY
DNAME	VARCH AR	20	
LOC	VARCH AR	10	

EMP TABLE

Column Name	Type	SIZ E	Constraint
EMPNO	INTEGER		PRIMARY KEY
ENAME	VARCHAR	20	NOT NULL
JOB	CHAR	10	
MGR	INTEGER		
HIREDATE	DATE		
SAL	DECIMAL	9,2	>0
COMM	INTEGER		
DEPTNO	INTEGER		FOREIGN KEY DEPT DEPTNO

Ques:2 Consider the given table and write SQL commands for following questions.

TABLE: GRADUATE

S.NO	NAME	STIPEND	SUBJECT	AVERAGE	DIV.
1	KARAN	400	PHYSICS	68	I
2	DIWAKAR	450	COMP. Sc.	68	I
3	DIVYA	300	CHEMISTRY	62	I

4	REKHA	350	PHYSICS	63	I
5	ARJUN	500	MATHS	70	I
6	SABINA	400	CHEMISTRY	55	II
7	JOHN	250	PHYSICS	64	I
8	ROBERT	450	MATHS	68	I
9	RUBINA	500	COMP. Sc.	62	I
10	VIKAS	400	MATHS	57	II

- Display the names of those students who have obtained DIV I sorted by NAME.
- Display a report, Displaying NAME, STIPEND, SUBJECT and amount of stipend received in a year assuming that the STIPEND is paid every month.
- To count the number of students who are either PHYSICS or COMPUTER SC graduates.
- To insert a new row in the GRADUATE table 11,"KAJOL", 300, "COMP. SC.", 75, 1

Ques:3 Write the SQL query commands based on following table

Table : Book

Book_id	Book name	Author_name	Publisher	Price	Type	Quantity
C0001	Fast Cook	Lata Kapoor	EPB	355	Cookery	5
F0001	The Tears	William Hopkins	First Publi.	650	Fiction	20
T0001	My First c++	Brain & Brooke	FPB	350	Text	10
T0002	C++ Brain works	A.W. Rossaine	TDH	350	Text	15
F0002	Thunderbolts	Anna Roberts	First Publ.	750	Fiction	50

Write SQL query for (a) to (d)

- To show book name, Author name and price of books of First Pub. Publisher
 - To list the names from books of text type.
 - To Display the names and price from books in ascending order of their prices.
 - To increase the price of all books of EPB publishers by 50.
- e. Give the output of the following :-**
- Select count(*) from Books
 - Select avg(Quantity) from Books
 - Select book_name, author_name from books where publishers='first publ.'
 - Select count(distinct publishers) from books where Price>=400.

Ques: 4 Consider the given table and write the output based on given queries:-

TABLE: Student

Rollno	Name	Age	City	Phone	Marks
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1	Ram	17	Delhi	123456	450
2	Priya	18	Chennai	345678	400
3	Ajay	17	NULL	11111	350
4	Kavita	17	Kolkata	22222	380
5	Ramya	20	Chennai	33333	NULL

- select ucase(name) from student where city = 'delhi';
- select substr(name,2,3) from student;
- select length(name) from student where city = 'chennai';
- select left(name,2) from student;
- select concate(Name,Age) from Student
- select right(City,3) from Student

Ques :5 Write the output:

- select power(-3,3);
- select round(12.543);
- select round(12.546,2);
- select round(-12.543,2);
- select mod(25,3);

Ques 6:

Consider the following table named "SOFTDRINK". Write commands of SQL for (i) to (iv).

Table : SOFTDRINK

DRINKCODE	DNAME	PRICE	CALORIES
101	Lime and Lemon	20.00	120
102	Apple Drink	18.00	120
103	Nature Nectar	15.00	115
104	Green Mango	15.00	140
105	Aam Panna	20.00	135
106	Mango Juice Bahaar	12.00	150

(i) To display names and drink codes of those drinks that have more than 120 calories.

(ii) To display drink codes, names and calories of all drinks, in descending order of calories.

(iii) To display names and price of drinks that have price in the range 12 to 18 (both 12 and 18 included).

(iv) Increase the price of all drinks in the given table by 10%.

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DRINKCODE DNAME CALORIES

Ques 7:

Consider the following table named "GYM" with details about fitness items being sold in the store. Write command of SQL for (i) to (iv).

Table : GYM

ICODE	INAME	PRICE	BRANDNAME
G101	Power Fit Exerciser	20000	Power Gymer
G102	AquaFit Hand Grip	1800	Reliable
G103	Cycle Bike	14000	Exobike
G104	Protoner Extreme Gym	30000	Coscote
G105	Message Belt	5000	Message Expert
G106	Cross Trainer	13000	GTC Fitness

- (i) To display the names of all the items whose name starts with "A".
 - (ii) To display ICODEs and INAMEs of all items, whose Brandname is Reliable or Coscote.
 - (iii) To change the Brandname to "Fit Trend India" of the item, whose ICODE as "G101".
- Add a new row for new item in GYM with the details :

"G107", "Vibro exerciser", 21000, "GTCFitness"

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Ques 8

Consider the following table FITNESS with details about fitness products being sold in the store. Write command of SQL for (i) to (iv).

Table : FITNESS

PCODE	PNAME	PRICE	Manufacturer
P1	Treadmill	21000	Coscote
P2	Bike	20000	Aone
P3	Cross Trainer	14000	Reliable
P4	Multi Gym	34000	Coscote
P5	Massage Chair	5500	Regrosene
P6	Belly Vibrator Belt	6500	Ambawya

- (i) To display the names of all the products with price more than 20000.
- (ii) To display the names of all products by the manufacturer "Aone".
- (iii) To change the price data of all the products by applying 25% discount reduction.
- (iv) To add a new row for product with the details :

"P7", "Vibro Exerciser", 28000, "Aone".