

**D.A.V.CENTENARY PUBLIC SCHOOL,
CHANDER NAGAR**

HOLIDAYS' HOME WORK

CLASS -XII

2022-2023

Class-12

Subject-English

Holidays' Homework

1. Read all the lessons that have been covered so far .

2. Write the following letters

Letters to the Editor

* giving suggestion on an issue
(concerning public interest)

* express your views on an issue
already raised in an article / write up /
published letter

3. job application along with a complete
biodata

डीएवी सेंटेनरी पब्लिक स्कूल
चंदर नगर गाज़ियाबाद
ग्रीष्मकालीन गृह कार्य

विषय : हिन्दी

कक्ष दसवीं

1. निम्नलिखित विषयों पर 200 शब्दों में निबंध लिखिए।

- जल है तो कल है।
- राजनीति और भ्रष्टाचार
- ऑनलाइन शिक्षा का महत्व
- कितना कुछ देती है प्रकृति
- जब अचानक भू-स्खलन हुआ
- मोबाइल खेलों की बढ़ती लत
- संचार माध्यम
- पत्रकारिता

2. प्रतिदिन एक सुलेख लिखना है।

3. अपने परिवार के सदस्यों की सहायता से प्रतिदिन 20 शब्दों का एक श्रुतलेख कीजिये।
4. गद्य और पद्य में अंतर बताते हुये गद्य की विधाओं पर एक परियोजना कार्य से संबंधित फ़ाइल तैयार कीजिये।
5. पहलवान की ढोलक कहानी का नाट्यरूपांतरण कीजिए।

Holiday homework
Class XII
Accountancy
Accounting for partnership firms- Fundamentals

1. What is meant by Partnership?
2. What is meant by Partnership Deed?
3. Give one difference between P & L A/c and P & L Appropriation A/c.
4. What are the provisions applicable in absence of partnership deed?
5. What is the difference between fixed capital and fluctuating capital account ?
6. Why there is a need of written agreement between the partners?
7. Nirupam and Sanjay were partners in a firm sharing profits in the ratio of 5: 3. Their fixed capitals were Rs. 150000 and 100000 respectively. The partnership deed provides that:
Interest on capital should be allowed @ 12 % p.a.
Nirupam should be allowed a salary of Rs. 20000 p.a.
A commission of 10 % of the net profit should be allowed to Sanjay
Prepare profit and loss appropriation account.
8. X, Y and Z are partners in a firm. The partnership deed Provides that interest on drawings will be charged @ 6% p.a. During the year ended 31-12-2006 X withdrew Rs. 2500 at the beginning of the every month and Y withdrew Rs.2500 at the end of each month and Z withdrew Rs 1500 at the beginning of each quarter. Calculate interest on the partner' drawings.
9. L, M, and N were partners in a firm. On 1-4-2007 their capital stood at Rs. 25000; Rs.12500 and Rs. 12500 respectively. As per the partnership deed :
 - (i) N was entitled for a salary of Rs. 2500 p.a.
 - (ii) Partners were entitled to interest on capital at 5% p.a.
 - (iii) Profits were to be shared in the ratio of partners' capital.The net profit for the year 2007-08 of Rs.16500 was divided equally without providing for the above terms. Pass an adjustment entry in journal to rectify the above error.
10. X, Y, and Z are partners sharing profits in the ratio of 5: 4: 1. Z is given a guarantee that his share of profit in any year would be not less than Rs. 10000. Deficiency if any would be borne by X and Y equally. The profits for the year 2008 amounted to Rs. 80000. Pass necessary entries in the books of the firm.
11. Sunny and Pinky started partnership on 01-04-2009 with capital of Rs. 125000 and Rs. 75000, respectively. On 01-10-2009, they decided that their capitals should be Rs. 100000 each. The necessary adjustments in the capitals are made by introducing or withdrawing cash. Interest on capital is to be allowed @ 10 % p.a. Calculate interest on capital as on 31-03-2010.
12. Simmy and Arihant were partners in a firm sharing profits in the ratio of 2:1. Simmy was 17 years old and Arihant was 20 years old. During the year the firm incurred a loss of ₹ 30,000 and Simmy did not satisfy to share the loss. Give your answer as per the Partnership Act, 1932 giving reasons.
13. Ajay and Jayesh are partners sharing profits equally. Ajay drew regularly ₹ 400 at the end of every month for the six months ending 30th June, 2006. Calculate Interest on Drawings at 5% p.a.

Deepanshu is a partner in a firm. He withdraws the following amount during the year 2010:

February 1	₹ 10,000
March 1	₹ 20,000
July 31	₹ 15,000
November 30	₹ 40,000

Interest on drawings is to be charged @ 7.5% p.a.

Calculate the interest to be charged on Deepanshu's Drawings.

14. Akansha, Mahima and Shubhangi are partners in a firm sharing Profits and Losses in the ratio of 2:2:1. Their fixed capitals are ₹ 1,00,000; ₹ 80,000; ₹ 70,000 respectively. For the year 2008-09 interest on capital was credited to them @9% p.a. instead of 12%. Give the necessary adjusting entry.

15. The capital accounts of Aman and Lakshay showed balances of ₹ 40,000 and ₹ 20,000 on 1st January, 2013. They shared profits in the ratio of 3:2. They are allowed interest on capitals @ 10% p.a. and are charged interest on drawings @ 12% p.a. Aman also advanced a loan of ₹ 10,000 to the firm on 1st May, 2013.

During the year Aman withdrew ₹ 1,000 per month at the beginning of every month, whereas Lakshay withdrew ₹ 1,000 per month at the end of every month.

The profits for the year, before the above mentioned adjustments were ₹ 20,960.

Show the distribution of profits and prepare partners capital accounts.

16. Akshita, Shruti and Sakshi are sharing profits and losses in the ratio of 3:2:1. After the final accounts have been prepared, it was discovered that interest on drawings had not been taken into consideration. The interest on drawings of the partners amounted to Akshita ₹ 250; Shruti ₹ 180 and Sakshi ₹ 100. Give the necessary adjusting journal entry.

17. Pragya and Priyanka are partners in a firm. Their capitals as on 1st April, 2013 were ₹ 2,50,000 and ₹ 1,50,000 respectively. They share profits equally. On July 1, 2013, they decided that their capitals should be ₹ 2,00,000 each. The necessary adjustments in the capitals were made by introducing or withdrawing cash. Interest on capital is allowed at 8% p.a. Compute interest on capital for both the partners for the year ending on March 31st, 2014.

18. Abhipriya and Himani start business on 1st April, 2013 with capitals of ₹ 3,00,000 and ₹ 2,00,000 respectively. According to the Partnership Deed, Himani is entitled to a salary of ₹ 5,000 per month and interest to be allowed on capitals @ 6% p.a. They also made drawings of ₹ 20,000 and ₹ 10,000 respectively. Interest on drawings was also to be charged at 10% p.a. The remaining profits to be distributed between the partners in the ratio of 5:3. During the year the firm earned a profit of ₹ 2,48,500.

Give the Journal Entries regarding relating to division of profits and prepare the Profit & Loss Appropriation A/c.

19. Aanchal and Kanika are partners sharing the profits and losses in the ratio of 2:3 with a capital of ₹ 2,00,000 and ₹ 1,00,000 respectively. Show the distribution of profits/losses for the year ended March 31, 2014 by preparing the relevant A/c in each of the alternative cases:

Case 1: If the partnership deed provides for interest on capital @ 6% p.a. and losses for the year is as ₹ 15,000.

Case 2: If the partnership deed provides for interest on capital @ 6% p.a. and the trading profits for the year is ₹ 21,000.

20. Aman, Ajay and Lakshay shared the profits of ₹ 7,50,000 in the ratio of 2:2:1 without providing for interest on Ajay's Loan. Ajay granted a loan of ₹ 5,00,000 in the beginning of accounting year. Whereas the partnership deed is silent on interest on loan and profit-sharing ratio. Give necessary adjusting entry.

21. Bhavna and Chitra are partners in a firm sharing profits and losses equally. On 1st April, 2013; the capitals of the partners were Bhavna ₹ 2,00,000 and Chitra ₹ 1,60,000. The profit and Loss A/c of the firm showed a net profit of ₹ 3,75,000 (before Interest on Bhavna's Loan) for the year ended March 31, 2014. Considering the following information, prepare the Profit and Loss Appropriation A/c of the firm and Partner's Capital A/c.

Interest on Capital to be allowed @ 6% p.a.

Interest on Bhavna's Loan of ₹ 1,00,000 for the whole year.

Interest on Partner's Drawings @ 6% p.a. Drawings being Bhavna- ₹ 40,000 and Chitra- ₹ 30,000.
Transfer 10% of distributable profits to the Reserve Fund.

22. On March 31, 2009 capital accounts of Kunal, Mehak and Deepanshu after making adjustments for profits, drawings, etc., were as Kunal- ₹ 8,00,000, Mehak- ₹ 6,00,000 and Deepanshu- ₹ 4,00,000. Subsequently it was discovered that interest on capital and interest on drawings had been omitted. The partners were entitled to interest on capital @ 5% p.a. The drawings during the year were: Kunal- ₹ 2,00,000, Mehak- ₹ 1,50,000 and Deepanshu- Rs. 90,000. Interest on drawings chargeable to the partners was Kunal- Rs. 5,000, Mehak- Rs. 3,600 and Deepanshu- ₹ 2,000. The net profit during the year amounted to ₹ 12,00,000. The profit-sharing ratio of the partners was 3:2:1. Record the necessary adjustment entry(s) for rectifying the above errors of omission. Show your workings.

23. Srishty and Ritika were partners in a firm sharing profits in the ratio of 3:2. As per the partnership deed, Interest on Capital is to be allowed @ 10% p.a. and interest on drawings is to be charged @ 5%. Ritika is to be allowed a salary of ₹ 500 p.m. and Srishty is to be given a commission of 10% of divisible profits. Ritika had advanced a loan of ₹ 10,000. The profits earned by the firm before any interest on loan and above provisions were ₹ 1,10,000. The capitals of the partners were fixed at ₹ 10,00,000 and ₹ 5,00,000 respectively. They also withdrew ₹ 50,000 each. Prepare Profit and Loss Appropriation A/c for the year ending 31st December, 2013.

24. Pratibha and Shivali were partners in a firm sharing profits in the ratio of 2:1. Interest on Drawings is to be allowed @ 10% p.a. Pratibha withdrew ₹ 500 in the beginning of each quarter whereas Shivali withdrew ₹ 1,000 at the end of each half year. Calculate the interest on drawings of each partner and also prepare Capital A/c of the partners if their capitals as on 01/04/2013 were ₹ 3,00,000 and ₹ 2,00,000 respectively.

25. Digamber, Shwetamber and Jain were partners in a firm sharing profits equally. Their capitals at the end of the year were ₹ 10,00,000; ₹ 10,00,000 and ₹ 5,00,000 respectively. They withdrew ₹ 50,000; ₹ 1,00,000 and ₹ 50,000 respectively. The interest on capital is to be allowed @ 10% and interest on drawings is to be charged @ 20% p.a. Shwetamber was to be allowed a salary of ₹ 1,20,000 p.a. The profits were distributed among them in the ratio of 2:2:1 without providing any of the above provision. Pass necessary adjustment entry if the profits earned during the year were ₹ 5,00,000.

26. Gangu and Teli were partners sharing profits in equally. They admit pappu as a new partner for 1/3rd share who was guaranteed a minimum profit of ₹ 50,000 by Teli. During the year the profit earned by the firm was ₹ 1,23,000. The interest on capital was allowed @ 5% and their capitals were ₹ 20,000 each. Prepare Profit and Loss Appropriation A/c.

27. Mayank, Love and Kamal are partners sharing profits in the ratio of 2:1:1. Their capitals as on 1st January, 2013 were ₹ 50,000; ₹ 30,000 and ₹ 20,000 respectively. At the end of the year it was found out that interest on capitals @ 12% p.a., salaries to Mayank ₹ 500 p.m. and Kamal ₹ 1,000 p.m. were not adjusted from the profits. Show adjusting entries to be made in the next year for above adjustments.

28. Akash and Rishabh were partners in a firm sharing profits and losses equally. Their capitals were ₹ 3,00,000 and ₹ 1,50,000 respectively. They charged interest on capital @ 10% instead of 12%. Pass the adjustment entry.

Calculation of Goodwill

Q1) A business has earned an average profit of Rs.1,00,000 during the last few years and the normal rate of return rate of return in similar business is 10 %. Find out the value of goodwill in similar business is 10 %. Find out the value of goodwill by:

1. Capitalisation of super profit method and
2. Super profit method if the goodwill is valued at 3 year's purchase of Super profit.

The assets of the business were Rs.10,00,000 and its external liabilities Rs.1,80,000.

Q2) A Partnership firm earned net profits during the last three years as follows:

Year- 2007-2008 –Rs. 1,90,000; 2008-2009 Rs.2,20,000; 2009-2010 Rs.2,50,000

The Capital employed in the firm throughout the above mentioned period has been Rs. 4,00,000. Having regard to the risk involved, 15% is considered to be a fair return on the capital. The remuneration of all the partners during this period is estimated to be Rs.1,00,000 per annum.

Calculate the Value of goodwill on the basis of –

Two year's purchase of super profits earned on average basis during the above mentioned three years and By Capitalisation method .

Q3) On 1st April, 2015 an existing firm had assets of Rs.75,000 including cash of Rs.5,000. The partners capital accounts showed a balance of Rs.60,000 and reserves constitute the rest. If normal rate of return is 20% and the goodwill of the firm is valued at Rs.24,000 at 4 Years Purchase of super profits, find the average profits of the firm.

Q4) From the following information, Calculate the value of goodwill of a firm of Chander and Gupta:

1. At 3 Year's purchase of average profits
 2. At 3 year's purchase of super profit
 3. On the basis of capitalisation of super profits
 4. On the basis of capitalization of average profits
- Average capital employed in the business Rs.7,00,000
 - Net Trading results of the firm for the past year profit 2013-Rs1,47,600, Loss 2014-Rs.1,48,100; profit 2015-Rs.4,48,700
 - Rate of Interest expected from capital having regard to risk involved 18%
 - Remuneration to each partner for his services Rs500 per month.

Change in Profit Sharing Ratio

1. A and B are partners in a firm sharing profits and losses in the ratio of 2 : 1. With effect from 1st January, 2015, they agreed to share profits and losses equally. Calculate the individual partner's gain or sacrifice due to change in ratio.
2. Ram, Shyam and Deepak are partners sharing profits and losses in the ratio of 7 : 2 : 1. With effect from 1st April, 2015, they agreed to share profits and losses equally. Calculate sacrifice and gain of the partners.
3. A, B and C are partners sharing profits in the ratio of 4 : 3 : 2. As per new agreement, C's new share will be 1/3, which he acquires from A and B in the ratio of 1 : 2. Compute new ratio and sacrifice and gain of the partners.
4. X, Y and Z are partners sharing profits and losses in the ratio of 4 : 3 : 3. As per new agreement, Z acquires 1/10th share, equally from X and Y. Compute new profit – sharing ratio and sacrifice and gain of the partners.
5. A, B and C are partners sharing profits and losses in the ratio of 5 : 3 : 2. As per new agreement, A agreed to sacrifice 1/2 of his share in favour of B and C in the ratio of 3 : 2. Compute new profit – sharing ratio and sacrifice and gain of partners.
6. X, Y and Z were sharing profits and losses in the ratio of 5 : 3 : 2. They decided to share future profits and losses in the ratio of 2 : 3 : 5 with effect from 01.04.2007. They decided to record the effect of following, without effecting their book values.

- Profit and Loss Account Rs. 24,000
- Advertisement Suspense Account Rs. 12,000

Pass necessary adjusting entry.

7. A and B are partners in a firm sharing profits and losses in the ratio of 5 : 2. On March 31, 2015, their Balance Sheet showed a General Reserve of Rs. 35,000. On that date, they decided to admit C as a new partner and the new profit – sharing ratio will be 5 : 3 : 2. Record necessary journal entries in the books of the firm under the following circumstances.
- When they want to transfer general reserve to their capital accounts.
 - When they don't want to transfer general reserve in their capital accounts but prefer to record an adjustment entry for the same.
8. A, B and C are partners in a firm sharing profits in ratio of 3 : 3 : 2. They decided to share profits equally in future. On that date, they had Rs. 72,000 in Profit & Loss Account and Rs. 48,000 in General Reserve. Pass journal entry in the following cases:
- Firm decided to close the Profit and Loss A/c and General Reserve A/c
 - Firm does not want to close the accounts of accumulated profits.
9. Amit and Sumit are partners in a firm sharing profits and losses in ratio 3 : 2. Their Balance Sheet as on 31 – 03 – 2014 was as under:

Liabilities	Rs.	Assets	Rs.
Capital A/c		Goodwill	1,20,000
Amit	1,50,000	Sundry Assets	2,80,000
Sumit	<u>1,00,000</u>		
Profit & Loss A/c	70,000		
Creditors	80,000		
	<u>4,00,000</u>		<u>4,00,000</u>

On 01 – 04 – 2014, they decided to share profits and losses equally. They also agreed to value goodwill of the firm at Rs. 1,00,000 but they did not want to alter the book value of goodwill and profits. Pass a single journal entry to record the change.

10. A, B and C are partners in a firm sharing profits and losses in the ratio 2 : 2 : 1. Their Balance Sheet as on 31 – 03 – 2009 was as follows:

Liabilities	Rs.	Assets	Rs.
Creditors	30,000	Bank	30,000
General Reserve	68,000	Debtors	40,000
Profit & Loss A/c	30,000	Less : Provision	<u>2,000</u>
Capital A/cs:		Stock	50,000
A	40,000	Furniture	30,000
B	40,000	Plant	80,000
C	<u>30,000</u>	Deferred Revenue Expenditure	10,000
	<u>1,10,000</u>		
	<u>2,38,000</u>		<u>2,38,000</u>

The partners agreed to share profits in the ratio of 1 : 1 : 1 from 01 – 04 – 2009. They further agreed that:

- Stock be valued at 20% or more.
- Doubtful debt provision be increased by Rs. 1,000.
- Depreciate furniture & plant by 10%.
- Rent outstanding is Rs. 2,000.
- Goodwill of the firm is valued at Rs. 51,000.
- Partners decided not to alter the values of assets, liabilities and reserves. They also did not want to show goodwill in the books.

Admission of a Partner

- A and B were partners in the ratio of 3 : 2. They admit C for $\frac{1}{4}$ th share in the profits of the firm. It was decided that C will bring ₹ 50,000 as goodwill and ₹ 3,00,000 as capital. Pass necessary journal entries and also find out the new profit-sharing ratio under both the cases:

 - When the goodwill is retained in the firm.
 - When goodwill is withdrawn by old partners.
- Sonu and Monu were partners in the ratio of 5 : 3. They admit Ramnik for $\frac{1}{4}$ th share which he will acquire equally from Sonu and Monu. Ramnik brings ₹60,000 as goodwill and ₹ 2,00,000 as Capital.

 - Pass necessary journal entries and also find out the new profit sharing ratio.
- (a) A and B are partners in a firm sharing profits in the ratio of 3 : 2. C is admitted as a partner. A and B surrender $\frac{1}{2}$ of their respective share in favour of C. Find the new profit sharing ratio and also the sacrificing ratio.

(b) C is to bring his share of premium for goodwill in cash. The goodwill of the firm is estimated at ₹50,000. Pass necessary entries for the record of goodwill in the above case.
- P, Q and R were partners in the ratio of 4 : 3 : 2. S was admitted for $\frac{2}{9}$ th shares. He brings ₹50,000 as capital and ₹20,000 as his share of Goodwill. The new profit sharing ratio was 3 : 2 : 2 : 2 respectively. Pass necessary journal entries and also find out the sacrificing ratio.
- Aarushi and Dipti were partners in the ratio of 2 : 1. Shalini and Mohini were admitted. After the admission of Shalini and Mohini their ratio becomes as 4 : 2 : 3 : 1. Goodwill of the firm was ₹90,000. Mohini brings her share of goodwill and ₹25,000 as capital. Shalini brings ₹25,000 cash and ₹18,000 with stock as her capital. She also brings her required amount of goodwill. Pass necessary journal entries.
- A and B were partners in the ratio of 3 : 2. They admit C for $\frac{3}{13}$ share. New profit Ratio after C's admission will be 5 : 5 : 3. C brought some assets in the form of his capital and for the share of his goodwill. Following were the assets:

i. Assets	₹
ii. Stock	3,17,200
iii. Building	3,12,000
iv. Plant and Machinery	1,82,000
v. At the time of admission of C goodwill of the firm was valued at ₹ 16,22,400. Pass necessary journal entries. Also prepare C's Capital Account.	
- A and B were partners in a firm sharing profits in the ratio of 3 : 1. On 1-3-2006, they admitted C as a new partner for $\frac{1}{4}$ th share in the profits. The new profit sharing ratio will be 2 : 1 : 1. C brought in 1,25,000 as his capital and 31,250 for his share of goodwill (Premium) in cash. On C's admission goodwill account appeared in the books of the firm at 18,750.

 - Pass necessary Journal entries in the books of the firm on C's admission.
- Rajan and Suresh were partners in the ratio of 4 : 1. They admit Raman for $\frac{1}{6}$ th share. Raman brings 2,70,000 as his share of goodwill. New ratio of Rajan, Suresh and Raman was 3 : 2 : 1 respectively. Pass necessary journal entries.
- X and Y were partners in the ratio of 4 : 1. Z was admitted for $\frac{1}{3}$ rd share. He brings 30,000 as his share of goodwill. Future profit of X and Y will be decided equally. Journalise these transactions. Also find out the new profit sharing ratio.
- Mona and Lata were partners in the ratio of 3 : 2. Reema was admitted as a new partner and it was decided that they will share future profits and losses equally. Reema brings 90,000 as her capital and goodwill of the firm at the time of admission was 108000. Pass necessary journal entries and also find out the sacrificing ratio under the following cases:

- a. When goodwill appears in the books 90,000.
- b. When goodwill appears in the books 1,80,000.
- c. When no goodwill appears in the books.

11. Ram and Shyam were partners sharing profits equally. They admit Mohan into partnership. Mohan paid only ₹4,000 for premium out of his share of premium ₹7,200 for $\frac{1}{4}$ th share of profits. Goodwill account appears in the books at ₹24,000. All the partners have decided that goodwill should not appear in the new firm's books. Give necessary journal entries.
12. Amita and Babita were partners in the ratio of 3 : 1. Charu was admitted for $\frac{1}{3}$ rd share. Charu's share of goodwill/premium was 30,000 which she was not able to bring it in cash. It was decided that new profit sharing ratio will be equal in future. Pass necessary journal entries.
13. A and B were partners with capital of 30,000 and 10,000 respectively. They admit C for $\frac{1}{4}$ th share. 20,000 were brought by C as his share of capital. Pass necessary Journal entries.

DAV CPS CN

Holidays home work Class: 12th
Subject: **Hindustani music(Vocal)**

Prepare a project file on the following topics:

1) **परिभाषाएं**

अलंकार , कण, मींड, खटका, मुर्की, गमक,
ग्राम, मूर्च्छना आलाप, तान

2)*रागों का समय सिद्धान्त*

3) **ग्रंथ परिचय**

क)संगीत रत्नाकर

ख) संगीत परिजात

4) तालें (परिचय, ठाह, दुगुन, तिगुन व चौगुन)

झपताल

रूपक ताल

धमार ताल

5) तानपुरा (संपूर्ण जानकारी)

6) राग परिचय

भैरव

बागेश्री

मालकौंस

7) जीवन परिचय (जीवनी)

उस्ताद बड़े गुलाम अली खां

पंडित कृष्ण राव शंकर पंडित

उस्ताद फैयाज खां

DAV Centenary Public School, Chander Nagar, GZB

Class : XII Subject : Economics

Holidays Homework

1. Revision of Money and Banking , Government budget, Foreign Exchange and balance of Payment.
2. Completion of Project file.

DAV Centenary Public School, Chander Nagar,GZB
Class : XII Subject : Computer Science
Holidays Homework

1. Try to learn PyQt5 and make a GUI.

DAV Centenary Public School, Chander Nagar,GZB
Class : XII Subject : Informatics Practices
Holidays Homework

1. Try to learn PyQt5 and make a GUI.

DAVCPS CHANDER NAGAR GHAZIABAD

Holiday Homework
Session 2022-2023
Class 12th Subject CHEMISTRY

CHAPTER — SOLUTIONS

SHORT ANSWER TYPE QUESTIONS

Short Answer Type Questions (SA-1) (2 marks)

1. Differentiate between molality and molarity of a solution. What is the effect of change in temperature of a solution on its molality and molarity?
2. Non-ideal solutions exhibit positive or negative deviations from Raoult's law. What are these deviations and why are they caused? Explain with one example each.
3. Define the terms osmosis and osmotic pressure. What is the advantage of using osmotic pressure as compared to other colligative properties for the determination of molar masses of solutes in solution?
4. A 1.00 molal aqueous solution of trichloroacetic acid (CCl_3COOH) is heated to its boiling point. The solution has the boiling point of 100.18°C . Determine the van't Hoff factor for trichloroacetic acid. (K_b for water = $0.512 \text{ K Kg Mol}^{-1}$)
5. Define the following terms:
 - (i) Mole fraction
 - (ii) Isotonic solutions
 - (iii) Van't Hoff factor
 - (iv) Ideal solution
6. Explain why aquatic species are more comfortable in cold water rather than in warm water.
7. State Raoult's law. How is it formulated for solutions of non-volatile solutes?

8. State Henry's law and mention two of its important applications. 9. Why do gases nearly always tend to be less soluble in liquids as the temperature is raised?
10. 18 g of glucose, $C_6H_{12}O_6$ (Molar mass-180 $g\ mol^{-1}$) is dissolved in 1 Kg of water in a saucepan. At what temperature will this solution boil? (K_b for water = 0.52 $K\ kg\ mol^{-1}$, boiling point of pure water = 373.15 K)
11. An aqueous solution of sodium chloride freezes below 273 K. Explain the lowering in freezing points of water with the help of a suitable diagram. 12. Derive expression for Raoult's law when the solute is non-volatile. 13. Calculate the molar mass of compound (molar mass = 256 $g\ mol^{-1}$) to be dissolved in 75 g of benzene to lower its freezing point by 0.48 K ($K_f = 5.12\ K\ kg\ mol^{-1}$) 14. Define an ideal solution and write one of its characteristics. 15. State Henry's law. What is the effect of temperature on the solubility of a gas in a liquid?
16. State Raoult's law for the solution containing volatile components. What is the similarity between Raoult's law and Henry's law?
17. How is the vapour pressure of a solvent affected when a non-volatile solute is dissolved in it? What is meant by positive deviations from Raoult's law? Give an example. What is the sign of $\Delta_{mix}H$ for positive deviation?
18. Differentiate between molarity and molality of a solution. How can we change molality value of a solution into molarity value?
19. Define azeotropes. What type of azeotrope is formed by positive deviation from Raoult's Law? Give an example.
20. (i) On mixing liquid X and liquid Y, volume of the resulting solution decreases. What type of deviation from Raoult's law is shown by the resulting solution? What change in temperature would you observe after mixing liquids X and Y? (ii) What happens when we place the blood cell in water (hypotonic solution)? Give reason.
21. Define osmotic pressure of a solution. How is the osmotic pressure related to the concentration of a solute in a solution?

22. (i) Gas (A) is more soluble in water than Gas (B) at the same temperature. Which one of

the two gases will have the higher value of K_H (Henry's constant) and why? (ii) In non-ideal solution, what type of deviation shows the formations of maximum boiling azeotrope? in a solution?

23. Define the following terms:

- (i) Abnormal molar mass
- (ii) van't Hoff factor (i)

24. (a) Explain why on addition of 1 mol of glucose to 1 litre of water, the boiling point of water increases.

(b) Henry's law constant for CO_2 in water is 1.67×10^8 Pa at 298 K. Calculate the quantity of CO_2 in 500 mL of soda water when packed under 2.5 atm CO_2 pressure at 298 K.

Short Answer Type-II (SA-II) (3 Marks)

1. 100 mg of a protein is dissolved in just enough water to make 10.0 mL of solution. If this solution has an osmotic pressure of 13.3 mm Hg at 25°C , what is the molar mass of the protein? ($R = 0.0821 \text{ L atm mol}^{-1} \text{ K}^{-1}$ and $760 \text{ mm Hg} = 1 \text{ atm}$.)

2. Calculate the freezing point depression expected for 0.0711 m aqueous solution of

Na_2SO_4 . If this solution actually freezes at -0.320°C , what would be the value of Van't

Hoff factor? (K_f for water is $1.86^\circ\text{C mol}^{-1}$)

3. A solution prepared by dissolving 1.25 g of oil of winter green (methyl salicylate) in

99.0 g of benzene has a boiling point of 80.31°C . Determine the molar mass of this compound. (B.P. of pure benzene = 80.10°C and K_b for benzene = $2.53^\circ\text{C kg mol}^{-1}$)

4. A solution of glycerol ($\text{C}_3\text{H}_8\text{O}_3$; molar mass = 92 g mol^{-1}) in water was

prepared by

dissolving some glycerol in 500 g of water. This solution has a boiling point of 100.42 °C. What mass of glycerol was dissolved to make this solution? K_b for water = 0.512 K kg mol⁻¹.

5. What mass of NaCl (molar mass = 58.5 g mol⁻¹) must be dissolved in 65 g of water to

lower the freezing point by 7.5°C? The freezing point depression constant, K_f , for water

is 1.86 K kg mol⁻¹. Assume van't Hoff factor for NaCl is 1.87. 6. What mass of ethylene glycol (molar mass = 62.0 g mol⁻¹) must be added to 5.50 kg of water to lower the freezing point of water from 0° C to -10.0° C? (K_f for water = 1.86 K

kg mol⁻¹)?

7. 15 g of an unknown molecular substance was dissolved in 450 g of water. The resulting

solution freezes at -0.34° C. What is the molar mass of the substance? (K_f for water = 1.86 K kg mol⁻¹).

8. What mass of NaCl must be dissolved in 65.0 g of water to lower the freezing point of

water by 7.5°C? The freezing point depression constant (K_f) for water is 1.86°C/m.

Assume van't Hoff factor for NaCl is 1.87. (Molar mass of NaCl = 58.5 g) 9. Calculate the amount of KCl which must be added to 1 kg of water so that the freezing point is depressed by 2K. (K_f for water = 1.86 K kg mol⁻¹)

10. A solution of glycerol (C₃H₈O₃) in water was prepared by dissolving some glycerol in 500

g 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?

11. 15.0 g of an unknown molecular material was dissolved in 450 g of water. The resulting solution was found to freeze at -0.34 °C. What is the molar mass of this material?

(K_f for water = 1.86 K kg mol⁻¹)

12. A solution containing 30 g of 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 added to this solution. The new vapour pressure becomes 2.9 kPa at 298 K. Calculate

(i) the molecular mass of solute and

(ii) vapour pressure of water at 298 K.

13. If N_2 gas is bubbled through water at 293K, how many millimoles of N_2 gas would dissolve in 1 litre of water? Assume that N_2 exerts a partial pressure of 0.987 bar. Given that Henry's law constant for N_2 at 293K is 76.48 k bar.

14. The partial pressure of ethane over a saturated solution containing 6.56×10^{-2} g of ethane

is 1 bar. If the solution contains 5.0×10^{-2} g of ethane, then what will be the partial pressure of the gas?

15. Determine the osmotic pressure of a solution prepared by dissolving 2.5×10^{-2} g of K_2SO_4 in 2L of water at $25^\circ C$, assuming that it is completely dissociated. ($R = 0.0821 \text{ L atm K}^{-1} \text{ mol}^{-1}$, Molar mass of $K_2SO_4 = 174 \text{ g mol}^{-1}$)

16. The partial pressure of ethane over a saturated solution containing 6.56×10^{-2} g of ethane

is 1 bar. If the solution were to contain 5.0×10^{-2} g of ethane, then what will be the partial pressure of the gas?

17. Some ethylene glycol, $HOCH_2CH_2OH$, is added to your car's cooling system along with 5

kg of water. If the freezing point of a water-glycol solution is $-15.0^\circ C$, what is the boiling point of the solution?

($K_b = 0.52 \text{ K kg mol}^{-1}$ and $K_f = 1.86 \text{ K kg mol}^{-1}$ for water)

18. 3.9 g of benzoic acid dissolved in 49 g of benzene shows a depression in freezing point of

1.62 K. Calculate the Van't Hoff factor and predict the nature of solute (associated or dissociated).

(Given : Molar mass of benzoic acid = 122 g mol^{-1} , K_f for benzene = $4.9 \text{ K kg mol}^{-1}$)

19. A solution is prepared by dissolving 10 g of non-volatile solute in 200 g of water. It has a

vapour pressure of 31.84 mm Hg at 308 K. Calculate the molar mass of the solute.

(Vapour pressure of pure water at 308 K = 32 mm Hg)

20. 45 g of ethylene glycol ($C_2H_6O_2$) is mixed with 600 g of water. Calculate (i) the freezing point depression and

(ii) the freezing point of the solution

(Given : K_f of water = $1.86 \text{ K kg mol}^{-1}$)

21. A 5 percent solution (by mass) of cane-sugar (M.W. 342) is isotonic with 0.877% solution of substance X. Find the molecular weight of X.

22. Calculate the boiling point of solution when 4 g of MgSO_4 ($M = 120 \text{ g mol}^{-1}$) was

dissolved in 100 g of water, assuming MgSO_4 undergoes complete ionization. (K_b for water = $0.52 \text{ K kg mol}^{-1}$)

23. Calculate the mass of a non-volatile solute (molecular mass 40) which should be

dissolved in 114 g octane to reduce the vapour pressure to 80%. 24. An aqueous solution of 2 percent 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? [Vapour pressure of water = 1.013 bar]

25. A 10% solution (by mass) of sucrose in water has freezing point of 269.15 K. Calculate

the freezing point of 10% glucose in water, if freezing point of pure water is 273.15 K.

Given: (Molar mass of sucrose = 342 g mol^{-1}) (Molar mass of glucose = 180 g mol^{-1})

26. The vapour pressure of pure liquids A and B at 400 K are 450 and 700 mmHg respectively. Find out the composition of liquid mixture if total vapour pressure at this temperature is 600 mmHg

Unit : 8 d & f Block elements

Multiple Choice Questions

Q1.

Which of the following arrangements does not represent the correct order of the property stated against it ?

A $\text{V}^{2+} < \text{Cr}^{2+} < \text{Mn}^{2+} < \text{Fe}^{2+}$: paramagnetic behaviour

B $\text{Ni}^{2+} < \text{Co}^{2+} < \text{Fe}^{2+} < \text{Mn}^{2+}$: ionic size

C $\text{Co}^{3+} < \text{Fe}^{3+} < \text{Cr}^{3+} < \text{Sc}^{3+}$: stability in aqueous solution

D $\text{Sc} < \text{Ti} < \text{Cr} < \text{Mn}$: number of oxidation states

Q.2

Which of the following lanthanoid ions is diamagnetic?

(At. nos.Ce = 58, Sm = 62, Eu = 63, Yb = 70)

A Ce^{2+}

B Sm^{2+}

C Eu^{2+}

D Yb^{2+}

Q.3

KMnO_4 can be prepared from K_2MnO_4 as per the reaction:



The reaction can go to completion by removing OH^- ions by adding

A KOH

B CO_2

C SO_2

D HCl

Q.4

Which of the following statements about the interstitial compounds is incorrect?

A They retain metallic conductivity

B They are chemically reactive

C They are much harder than the pure metal

D They have higher melting points than the pure metal

Q.5

All the metals form oxides of the type MO except

A copper

B barium

C silver

D lead

Q.6

Among the following, the coloured compound is

A CuCl

B $K_3[Cu(CN)_4]$

C CuF_2

D $[Cu(CH_3CN)_4]BF_4$

Q.7

How many 'd' electrons are in present Cr^{2+} ion

A 4

B 5

C 6

D 3

Q.8

Cyanide process is used for extraction of

A Ag

B Ni

C Pt

D Zn

Q.9

Extraction for zinc blende is achieved by

A electrolytic reduction

B roasting followed by reduction with carbon

C roasting followed by reduction with another metal

D roasting followed by self reduction

Q.10

Formation of coloured solution is possible when metal ion in the compound contains

A paired electrons

B unpaired electrons

C lone pair of electrons

D none of these

Q.11

Identify the incorrect statement among the following

A d-Block elements show irregular and erratic chemical properties among themselves B

La and Lu have partially filled d orbitals and no other partially filled orbitals C The chemistry of various lanthanoids is very similar

D 4f and 5f orbitals are equally shielded

Q.12 Which one of the following ions exhibits colour in aqueous solution

A Sc^{3+}

B Ni^{2+}

C Ti^{4+}

D Zn^{2+}

Q.13

Which one of the following is a diamagnetic ion?

A Co^{2+}

B Cu^{2+}

C Mn^{2+}

D Sc^{3+}

Q.14

Which ore contains both iron and copper?

- A Cuprite
- B Chalcocite
- C Chalcopyrite
- D Malachite

Q.15

Which pair of compounds is expected to show similar colour in aqueous medium?

- A FeCl_2 and CuCl_2
- B VOCl_2 and CuCl_2
- C VOCl_2 and FeCl_2
- D FeCl_2 and MnCl_2

Q.16

Zn does not show variable valency because of

- A complete d sub-shell
- B inert pair effect
- C $4s^2$ sub-shell
- D None of these

Q.17

When copper pyrites is roasted in excess of air, a mixture of $\text{CuO} + \text{FeO}$ is formed. FeO is present as impurities. This can be removed as slag during reduction of CuO . The flux added to form slag is:

- A SiO_2 , which is an acid flux
- B Lime stone, which is a basic flux
- C SiO_2 , which is basic flux
- D CaO ; which is basic flux

Q.18

'Hydride Gap' is referred to which region of the periodic table?

A Groups 3, 4 and 5

B Groups 5, 6 and 7

C Groups 4, 5 and 6

D Groups 7, 8 and 9

Q.19

Which of the statements is not true?

A $K_2Cr_2O_7$ solution in acidic medium is orange

B $K_2Cr_2O_7$ solution becomes yellow on increasing the pH beyond 7

C On passing H_2S through acidified $K_2Cr_2O_7$ solution, a milky colour is observed

D $Na_2Cr_2O_7$ is preferred over $K_2Cr_2O_7$ in volumetric analysis

Q.20

Which one of the following sets correctly represents the increase in the paramagnetic property of the ion?

A $Cu^{2+} < V^{2+} < Cr^{2+} < Mn^{2+}$

B $Cu^{2+} < Cr^{2+} < V^{2+} < Mn^{2+}$

C $Mn^{2+} < V^{2+} < Cr^{2+} < Cu^{2+}$

D $Mn^{2+} < Cu^{2+} < Cr^{2+} < V^{2+}$

d & f - Block elements

Short answer questions (3 Marks)

1. a) Transition metal compounds are paramagnetic. Give reason. b) Calculate the spin only magnetic moment of Mn in $K_4[Fe(NCS)_6]$

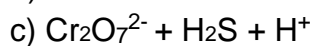
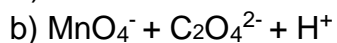
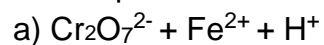
2. a) Of the ions Ti^{4+} , Ag^+ and Co^{2+} which one will be coloured in aqueous solution (Atomic No. Ag = 47, Ti = 22, Co = 27)

b) If each one of the above ionic species is placed in a magnetic field, how will they respond and why?

3. How would you account for the following situations.

- a) Transition metals generally form coloured compounds .
- b) With $3d^4$ configuration, Cr^{2+} act as reducing agent but Mn^{3+} act as an oxidizing agent.
- c) Actinides exhibit larger number of oxidation states than the corresponding lanthanides.

4. Complete the following equations for the reactions.



5. Account for the following.

a) The atomic radii of 4d and 5d series elements are virtually the same. b) The E^0 value for Mn^{3+}/Mn^{2+} couple is much more positive than Fe^{3+}/Fe^{2+} couple.

c) The highest oxidation state of a metal is exhibited in its oxide or fluoride.

Chemistry Practical

Learn the tests of acidic radicals and basic radicals

Class xii

Holiday home work(assignment)

1. What was the huge obstacle in nation building at the time of India, independence?
2. Who played a historic role in negotiating with the rulers of princely states to join the Indian union?
3. Name the leader who advocated separate Andhra Pradesh by observing fast unto death and participation in salt satyagraha.
4. What are the reasons being used by nearly everyone for keeping India secular? Do you think these reasons were only ethical and sentimental? Or were there some prudential reasons as well?
5. What do OEEC and EEC stand for?
6. Name any two common economic features of European Union.
7. What do ASEAN, FTA and ARF stand for?
8. Which country became the successor state of the USSR after its disintegration in 1991?
9. Israel has become one of the most powerful nations in the 21st century. Support the given statement with four relevant points.
10. Highlight any four limitations of SAARC.
11. When was Asean regional forum established? What was its objective?
12. Mention two steps taken by China to improve its economy. State two features of the European Union that make it an influential organization.
13. What do ASEAN and FTA stand for?
14. Name any two founder members of ASEAN. Under which plan did USA extend financial support.
15. Since the end of cold War there have been significant changes in India China relations identify any one such change.
16. Mention any three features that distinguish the Soviet economy from that of a capitalist country like the US.
17. List three challenges to democracy in Nepal.
18. Mention the areas of cooperation and disagreement between India and Bangladesh.
19. India's neighbours often think that the Indian government tries to dominate and interfere in the domestic affairs of the smaller countries of the region. Is it a correct impression?
20. What are some of the similarities and differences between Bangladesh and Pakistan in their democratic experiences?

D.A.V. CENTENARY PUBLIC SCHOOL, CHANDER NAGAR

HOLIDAY HOMEWORK

CLASS – XII A

SUBJECT- PHYSICS

1. Make a working model in group of four students from the topic given below
BUILDING GREEN CITY.
2. Practice paves the way to success. Hence utilize your vacations and practice the syllabus covered so far in Physics through assignment given below.

ASSIGNMENT

ELECTROSTATICS

TOPIC: ELECTRIC CHARGE, COULOMB'S LAW & ELECTRIC FIELD.

Q1.

When the distance between the charged particles is halved, the force between them becomes

- | | |
|----------------|----------------|
| (a) One-fourth | (b) Half |
| (c) Double | (d) Four times |

Q2.

There are two charges +1 micro coulombs and +5 micro coulombs. The ratio of the forces acting on them will be

- | | |
|-----------|------------|
| (a) 1 : 5 | (b) 1 : 1 |
| (c) 5 : 1 | (d) 1 : 25 |

Q3.

A charge q_1 exerts some force on a second charge q_2 . If third charge q_3 is brought near, the force of q_1 exerted on q_2

- (a) Decreases
- (b) Increases
- (c) Remains unchanged
- (d) Increases if q_3 is of the same sign as q_1 and decreases if q_3 is of opposite sign

Q4.

Three charges $4q$, Q and q are in a straight line in the position of $0, L/2$ and L respectively. The resultant force on q will be zero, if $Q =$

- (a) $-q$ (b) $-2q$
(c) $-q/2$ (d) $4q$

Q5.

When 10^{14} electrons are removed from a neutral metal sphere, the charge on the sphere becomes

- (a) $-16 \mu\text{C}$ (b) $16 \mu\text{C}$
(c) $-32 \mu\text{C}$ (d) $32 \mu\text{C}$

Q6.

Two similar spheres having $+q$ and $-q$ charge are kept at a certain distance. F force acts between the two. If in the middle of two spheres, another similar sphere having $+q$ charge is kept, then it experience a force in magnitude and direction as

- (a) Zero having no direction (b) $8F$ towards $+q$ charge
(c) $8F$ towards $-q$ charge (d) $4F$ towards $+q$ charge

Q7.

A charge Q is divided into two parts of q and $Q - q$. If the coulomb repulsion between them when they are separated is to be maximum, the ratio of Q/q should be

- (a) 2 (b) $1/2$
(c) 4 (d) $1/4$

Q8.

Two small conducting spheres of equal radius have charges $+10 \mu\text{C}$ and $-20 \mu\text{C}$ respectively and placed at a distance R from each other experience force F_1 . If they are brought in contact and separated to the same distance, they experience force F_2 . The ratio of F_1 to F_2 is

- (a) $1 : 8$ (b) $-8 : 1$
(c) $1 : 2$ (d) $-2 : 1$

Q9.

Two charges each equal to $2\mu\text{C}$ are 0.5m apart. If both of them exist inside vacuum, then the force between them is

- (a) 1.89 N (b) 2.44 N
(c) 0.144 N (d) 3.144 N

Q10.

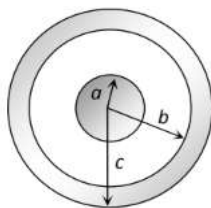
Two charges are at a distance 'd' apart. If a copper plate (conducting medium) of thickness $d/2$ is placed between them, the effective force will be

- (a) 2F (b) $F/2$
(c) 0 (d) $\sqrt{2}F$

Q11.

A solid conducting sphere of radius a has a net positive charge $2Q$. A conducting spherical shell of inner radius b and outer radius c is concentric with the solid sphere and has a net charge $-Q$. The surface charge density on the inner and outer surfaces of the spherical shell will be

- (a) $-\frac{2Q}{4\pi b^2}, \frac{Q}{4\pi c^2}$
(b) $-\frac{Q}{4\pi b^2}, \frac{Q}{4\pi c^2}$
(c) $0, \frac{Q}{4\pi c^2}$



- (d) None of the above

Q12.

Three charges each of magnitude q are placed at the corners of an equilateral triangle, the electrostatic force on the charge placed at the center is (each side of triangle is L)

- (a) Zero (b) $\frac{1}{4\pi\epsilon_0} \frac{q^2}{L^2}$
(c) $\frac{1}{4\pi\epsilon_0} \frac{3q^2}{L^2}$ (d) $\frac{1}{12\pi\epsilon_0} \frac{q^2}{L^2}$

Q13.

The charges on two sphere are $+7\mu\text{C}$ and $-5\mu\text{C}$ respectively. They experience a force F . If each of them is given an additional charge of $-2\mu\text{C}$, the new force of attraction will be

- (a) F (b) $F/2$ (c) $F/\sqrt{3}$ (d) $2F$

Q14.

Two point charges $3 \times 10^{-6} \text{ C}$ and $8 \times 10^{-6} \text{ C}$ repel each other by a force of $6 \times 10^{-3} \text{ N}$. If each of them is given an additional charge $-6 \times 10^{-6} \text{ C}$, the force between them will be

- (a) $2.4 \times 10^{-3} \text{ N}$ (attractive) (b) $2.4 \times 10^{-9} \text{ N}$ (attractive)
(c) $1.5 \times 10^{-3} \text{ N}$ (repulsive) (d) $1.5 \times 10^{-3} \text{ N}$ (attractive)

Q15.

A charge of $Q \text{ coulomb}$ is placed on a solid piece of metal of irregular shape. The charge will distribute itself

- (a) Uniformly in the metal object
(b) Uniformly on the surface of the object
(c) Such that the potential energy of the system is minimised
(d) Such that the total heat loss is minimised

Q16.

Five balls numbered 1 to 5 are suspended using separate threads. Pairs (1, 2), (2, 4) and (4, 1) show electrostatic attraction, while pair (2, 3) and (4, 5) show repulsion. Therefore ball 1 must be

- (a) Positively charged (b) Negatively charged
(c) Neutral (d) Made of metal

Q17.

Two spherical conductors B and C having equal radii and carrying equal charges in them repel each other with a force F when kept apart at some distance. A third spherical conductor having same radius as that of B but uncharged is brought in contact with B , then brought in contact with C and finally removed away from both. The new force of repulsion between B and C is

- (a) $F/4$ (b) $3F/4$
(c) $F/8$ (d) $3F/8$

Q18.

A force F acts between sodium and chlorine ions of salt (sodium chloride) when put 1 cm apart in air. The permittivity of air and dielectric constant of water are ϵ_0 and K respectively. When a piece of salt is put in water electrical force acting between sodium and chlorine ions 1 cm apart is

- (a) $\frac{F}{K}$ (b) $\frac{FK}{\epsilon_0}$
(c) $\frac{F}{K\epsilon_0}$ (d) $\frac{F\epsilon_0}{K}$

Q19.

If an electron is placed in a uniform electric field, then the electron will

- (1) experience no force.
- (2) moving with constant velocity in the direction of the field.
- (3) move with constant velocity in the direction opposite to the field.
- (4) accelerate in direction opposite to field.

Q20.

If $Q = 2$ coulomb and force on it is $F = 100$ newton, then the value of field intensity will be

- (1) 100 N/C
- (2) 50 N/C
- (3) 200 N/C
- (4) 10 N/C

Q21.

A charged water drop of radius $0.1 \mu\text{m}$ is under equilibrium in some electric field. The charge on the drop is equivalent to electronic charge. The intensity of electric field is ($g = 10 \text{ m/s}^2$)-

- (1) 1.61 NC^{-1}
- (2) 26.2 NC^{-1}
- (3) 262 NC^{-1}
- (4) 1610 NC^{-1}

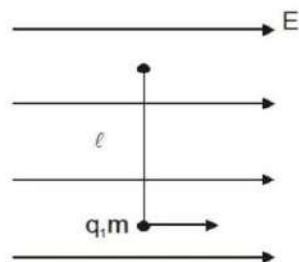
Q22.

There is a uniform electric field in x-direction. If the work done by external agent in moving a charge of 0.2 C through a distance of 2 metre slowly along the line making an angle of 60° with x-direction is 4 joule, then the magnitude of E is:

- (1) $\sqrt{3} \text{ N/C}$
- (2) 4 N/C
- (3) 5 N/C
- (4) 20 N/C

Q23.

A simple pendulum has a length ℓ , mass of bob m . The bob is given a charge q coulomb. The pendulum is suspended in a uniform horizontal electric field of strength E as shown in figure, then calculate the time period of oscillation when the bob is slightly displace from its mean position is :



(1) $2\pi \sqrt{\frac{\ell}{g}}$

(2) $2\pi \sqrt{\left[\frac{\ell}{g + \frac{qE}{m}} \right]}$

(3) $2\pi \sqrt{\left[\frac{\ell}{g - \frac{qE}{m}} \right]}$

(4) $2\pi \sqrt{\frac{\ell}{g^2 + \left(\frac{qE}{m} \right)^2}}$

Q24.

Charge $2Q$ and $-Q$ are placed as shown in figure. The point at which electric field intensity is zero will be:



- (1) Somewhere between $-Q$ and $2Q$
- (2) Somewhere on the left of $-Q$
- (3) Somewhere on the right of $2Q$
- (4) Somewhere on the right bisector of line joining $-Q$ and $2Q$

Q25.

The maximum electric field intensity on the axis of a uniformly charged ring of charge q and radius R will be :

- (1) $\frac{1}{4\pi\epsilon_0} \frac{q}{3\sqrt{3}R^2}$ (2) $\frac{1}{4\pi\epsilon_0} \frac{2q}{3R^2}$ (3) $\frac{1}{4\pi\epsilon_0} \frac{2q}{3\sqrt{3}R^2}$ (4) $\frac{1}{4\pi\epsilon_0} \frac{3q}{2\sqrt{3}R^2}$

Q26.

A charged particle of charge q and mass m is released from rest in an uniform electric field E . Neglecting the effect of gravity, the kinetic energy of the charged particle after time ' t ' seconds is

- (1) $\frac{Eqm}{t}$ (2) $\frac{E^2q^2t^2}{2m}$ (3) $\frac{2E^2t^2}{mq}$ (4) $\frac{Eq^2m}{2t^2}$

HOLIDAY'S HOME WORK (2022 23)
XII (MATHEMATICS)

Ch.2- Inverse Trigonometric Functions

Q.1. Find the value of : $\tan^{-1}(1) + \cos^{-1}(-1/2) + \sin^{-1}(-1/2)$.

Q.2. Prove : $\tan^{-1}x + \tan^{-1} \frac{2x}{1-x^2} = \tan^{-1} \left(\frac{3x-x^3}{1-3x^2} \right)$, $|x| < \frac{1}{\sqrt{3}}$

Q.3. If $\tan^{-1} \frac{x-1}{x-2} + \tan^{-1} \frac{x+1}{x+2} = \frac{\pi}{4}$, then find the value of x.

Q.4. Find the value of $\sin \left(\frac{\pi}{3} - \sin^{-1} \left(\frac{-1}{2} \right) \right)$.

Q.5. Prove : $\sin^{-1} \frac{12}{13} + \cos^{-1} \frac{4}{5} + \tan^{-1} \frac{63}{16} = \pi$

Q.6. Solve : $\tan^{-1}2x + \tan^{-1}3x = \frac{\pi}{4}$

Q.7. Prove : $\frac{9\pi}{8} - \frac{9}{4}\sin^{-1} \frac{1}{3} = \frac{9}{4}\sin^{-1} \frac{2\sqrt{2}}{3}$

Q.8. Solve : $\sin^{-1}(1-x) - 2\sin^{-1}x = \frac{\pi}{2}$.

Q.9. Evaluate: $\tan^{-1}\sqrt{3} - \sec^{-1}(-2) + \operatorname{cosec}^{-1} \frac{2}{\sqrt{3}}$.

Q.10. Prove : $\tan^{-1} \left\{ \frac{\sqrt{1+\cos x} + \sqrt{1-\cos x}}{\sqrt{1+\cos x} - \sqrt{1-\cos x}} \right\} = \frac{\pi}{4} + \frac{x}{2}$

Q.11. Simplify: $\sin^{-1} \left(\frac{\sin x + \cos x}{\sqrt{2}} \right)$, $-\frac{\pi}{4} < x < \frac{\pi}{4}$.

Q.12. Prove: $\sec^2(\tan^{-1}2) + \operatorname{cosec}^2(\cot^{-1}3) = 15$.

Q.13. Simplify : $\tan^{-1} \left(\frac{a \cos x - b \sin x}{b \cos x + a \sin x} \right)$

Q.14. Prove : $\tan^{-1} \frac{1}{5} + \tan^{-1} \frac{1}{7} + \tan^{-1} \frac{1}{3} + \tan^{-1} \frac{1}{8} = \frac{\pi}{4}$

Q.15. If $\sin(\sin^{-1} \frac{1}{5} + \cos^{-1} x) = 1$, then find the value of x.

Q.16.. Prove that : $2 \tan^{-1} \left(\sqrt{\frac{a-b}{a+b}} \tan \theta / 2 \right) = \cos^{-1} \left(\frac{a \cos \theta + b}{a + b \cos \theta} \right)$

Q.17. Find the principal value of $\text{Sec}^{-1} (-\sqrt{2})$

Q.18. Find value of $\text{Sin} \left[\tan^{-1} \frac{1-x^2}{2x} + \cos^{-1} \frac{1-x^2}{1+x^2} \right]$

Q.19. If $2 \tan^{-1} (\text{Cos } \theta) = \tan^{-1} (2 \text{ cosec } \theta)$, find θ .

Q.20. Simplify $\cot^{-1} \left[\frac{\sqrt{1+\sin x} + \sqrt{1-\sin x}}{\sqrt{1+\sin x} - \sqrt{1-\sin x}} \right]$

Ch.3- Matrices

- Q.1. Construct a 3×4 matrix, whose elements are given by $a_{ij} = \frac{1}{2}|-3i + j|$
- Q.2. Construct a 2×3 matrix $A = [a_{ij}]$ whose elements are given by $a_{ij} = \frac{(j-2i)^3}{4j}, i \neq j$
 $= |i + 2j|, i = j$
- Q.3. If $A = \begin{bmatrix} 8 & 0 \\ 4 & -2 \\ 3 & 6 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & -2 \\ 4 & 2 \\ -5 & 1 \end{bmatrix}$, then find the matrix X, such that $2A + 3X = 5B$.
- Q.4. If $A = \begin{bmatrix} 0 & -\tan \alpha/2 \\ \tan \alpha/2 & 0 \end{bmatrix}$ and $I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$, then show that $I+A = (I-A) \begin{bmatrix} \cos \alpha & -\sin \alpha \\ \sin \alpha & \cos \alpha \end{bmatrix}$
- Q.5. Express the matrix $A = \begin{bmatrix} 2 & -2 & -4 \\ -1 & 3 & 4 \\ 1 & -2 & -3 \end{bmatrix}$ as the sum of symmetric and skew-symmetric matrix
- Q.6. Obtain the inverse of the matrix $A = \begin{bmatrix} 0 & 1 & 2 \\ 1 & 2 & 3 \\ 3 & 1 & 1 \end{bmatrix}$ using elementary transformations.
- Q.7. If $f(x) = \begin{bmatrix} \cos x & -\sin x & 0 \\ \sin x & \cos x & 0 \\ 0 & 0 & 1 \end{bmatrix}$ Prove that $f(x) \cdot f(y) = f(x+y)$
- Q.8. Show that the matrix $B'AB$ is symmetric or skew-symmetric according as A is symmetric or skew symmetric.
- Q.9. If A and B are invertible matrices of the same order, then prove that $(AB)^{-1} = B^{-1}A^{-1}$
- Q.10. Let $f(x) = x^2 - 5x + 6$. Find $f(A)$ If $A = \begin{bmatrix} 2 & 0 & 1 \\ 2 & 1 & 3 \\ 1 & -1 & 0 \end{bmatrix}$
- Q.11. If $A = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$ Show that $A^2 - 5A + 7I = 0$, Use this to find A^4 .

Q.12. Express the matrix $A = \begin{bmatrix} 4 & 2 & -1 \\ 3 & 5 & 7 \\ 1 & -2 & 1 \end{bmatrix}$ as the sum of a symmetric and a skew-symmetric matrix.

Q.13. Find the values of x, y, z if the matrix $A = \begin{bmatrix} 0 & 2y & z \\ x & y & -z \\ x & -y & z \end{bmatrix}$ satisfy the equation $A'A = I_3$.

Q.14. Show that : $\begin{bmatrix} 1 & -\tan\theta/2 \\ \tan\theta/2 & 1 \end{bmatrix} \begin{bmatrix} 1 & \tan\theta/2 \\ -\tan\theta/2 & 1 \end{bmatrix}^{-1} = \begin{bmatrix} \cos\theta & -\sin\theta \\ \sin\theta & \cos\theta \end{bmatrix}$

Q.18. Find the inverse of

$$\begin{bmatrix} a+ib & c+id \\ -c+id & a-ib \end{bmatrix}, \quad \text{if } a^2 + b^2 + c^2 + d^2 = 1.$$

Q.19. Using the method of reduction (i.e elementary row transformations), find the inverse of

$$\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 1 & 2 & -1 \end{bmatrix}$$

Q.20. For what value of k the matrix $A = \begin{bmatrix} 2 & k \\ 3 & 5 \end{bmatrix}$ has no inverse.

Q.22. Prove that the product of matrices

$$\begin{bmatrix} \cos^2\theta & \cos\theta.\sin\theta \\ \cos\theta.\sin\theta & \sin^2\theta \end{bmatrix} \text{ and } \begin{bmatrix} \cos^2\phi & \cos\phi.\sin\phi \\ \cos\phi.\sin\phi & \sin^2\phi \end{bmatrix}$$

is the null matrix, when θ and ϕ differ by an odd multiple of $\frac{\pi}{2}$.

Q.23. A matrix X has $a + b$ rows and $a + 2$ columns while the matrix Y has $b + 1$ rows and $a + 3$ columns. Both matrices XY and YX exist. Find a and b . Can you say XY and YX are of the same type? Are they equal.

Q.24. Find the matrix A satisfying the matrix equation

$$\begin{bmatrix} 2 & 1 \\ 3 & 2 \end{bmatrix} A \begin{bmatrix} -3 & 2 \\ 5 & -3 \end{bmatrix} = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

Ch.4- Determinants

Q.1. Prove that : $\begin{vmatrix} 1 & x & x^2 \\ x^2 & 1 & x \\ x & x^2 & 1 \end{vmatrix} = (1-x^3)^2$

Q.2. Find the equation of the line joining A(1,3) and B(0,0) using determinants and find if D (K, 0) is a point such that area of a triangle ABD is 3 square units.

Q.3. If $A = \begin{bmatrix} 2 & -1 & 1 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{bmatrix}$ Verify that $A^3 - 6A^2 + 9A - 4I = 0$ and hence find A^{-1}

Q.4. Prove that : $\begin{vmatrix} a+bx & c+dx & p+qx \\ ax+b & cx+d & px+q \\ u & v & w \end{vmatrix} = (1-x^2) \begin{vmatrix} a & c & p \\ b & d & q \\ u & v & w \end{vmatrix}$

Q.5. Solve by matrix method:

$$\begin{aligned} 2x + y + z &= 1 \\ x - 2y - z &= 3/2 \\ 3y - 5z &= 9 \end{aligned}$$

Q.6. Prove that :

$$\begin{vmatrix} a & a+b & a+b+c \\ 2a & 3a+2b & 4a+3b+2c \\ 3a & 6a+3b & 10a+6b+3c \end{vmatrix} = a^3$$

Q.7. Prove that : $\begin{vmatrix} 1+a & 1 & 1 \\ 1 & 1+b & 1 \\ 1 & 1 & 1+c \end{vmatrix} = abc + bc + ca + ab.$

Q.8. Solve : $\begin{vmatrix} x-2 & 2x-3 & 3x-4 \\ x-4 & 2x-9 & 3x-16 \\ x-8 & 2x-27 & 3x-64 \end{vmatrix} = 0$

Q.9. Using determinants, find the area of the triangle whose vertices are (1, 4), (2, 3), (-5, 3). Are the given points collinear.

Q.10. If the points (a_1, b_1) , (a_2, b_2) and $(a_1 + a_2, b_1 + b_2)$ are collinear, Show that $a_1b_2 = a_2b_1$.

Q.11. If a, b, c are all positive and are p^{th} , q^{th} and r^{th} terms of G.P., then show that

$$\Delta = \begin{vmatrix} \log a & p & 1 \\ \log b & q & 1 \\ \log c & r & 1 \end{vmatrix} = 0$$

Q.12. If $\begin{vmatrix} a & b & ax+by \\ b & c & bx+cy \\ z-y & x-y & 0 \end{vmatrix} = 0$, then Prove that

a, b, c are in G.P or x, y, z are in G.P

Q.13. If x, y, z are different and

$$\Delta = \begin{vmatrix} x & x^2 & 1+x^3 \\ y & y^2 & 1+y^3 \\ z & z^2 & 1+z^3 \end{vmatrix} = 0, \text{ then show that } 1+xyz = 0$$

Q.14. Show that points A (a, b + c), B (b, c + a), C (c, a + b) are collinear.

Q.15. The sum of three numbers is 6. If we multiply third number by 3 and add second number to it, we get 11. By adding first and third numbers, we get double of the second number. Represent it algebraically and find the numbers using matrix method.

Q.16. Show that the following system of equations is consistent $2x - y + 3z = 5$, $3x + 2y - z = 7$, $4x + 5y - 5z = 9$. Also, find the solution.

Q.17. Using matrix method, solve the following system of equations for x, y and z :

$$\frac{2}{x} - \frac{3}{y} + \frac{3}{z} = 10, \quad \frac{1}{x} + \frac{1}{y} + \frac{1}{z} = 10, \quad \frac{3}{x} - \frac{1}{y} + \frac{2}{z} = 13$$

Q.18. Find whether the following system of equations is consistent or not, find the solution of the system also.

$$3x-y+2z = 3, \quad x-2y-z = 1, \quad 2x+y + 3z = 5.$$

Q.19. Determine the product $\begin{bmatrix} -4 & 4 & 4 \\ -7 & 1 & 3 \\ 5 & -3 & -1 \end{bmatrix} \begin{bmatrix} 1 & -1 & 1 \\ 1 & -2 & -2 \\ 2 & 1 & 3 \end{bmatrix}$ and use it solve the system of equations :

$$\begin{aligned} x-y+z &= 4 \\ x-2y-2z &= 9 \\ 2x+y+3z &= 1 \end{aligned}$$

Q.20. If $A = \begin{bmatrix} 2 & -1 & 1 \\ 3 & 0 & -1 \\ 2 & 6 & 0 \end{bmatrix}$, find A^{-1} , using A solve the following system of linear equations.

$$\begin{aligned} 2x - y + z + 3 &= 0 \\ 3x - z + 8 &= 0 \\ 2x + 6y - 2 &= 0 \end{aligned}$$

Q.21. Prove that $\begin{vmatrix} x & x^2 & yz \\ y & y^2 & zx \\ z & z^2 & xy \end{vmatrix} = (x-y)(y-z)(z-x)(xy + yz + zx)$

Q.22. Show that $\begin{vmatrix} (y+z)^2 & xy & zx \\ xy & (x+z)^2 & yz \\ xz & yz & (x+y)^2 \end{vmatrix} = 2xyz(x+y+z)^3$

----- 0 -----

Holidays Home-Work

Physical Education (048)

Class XII

2022

1. Do both the assignments (attached) in your physical education note book.
2. Make a project on Any one game of your choice out of the list above. Labeled diagram of field & equipment (Rules, Terminologies & Skills)

Basketball, Football, Kabaddi, Kho-Kho, Volleyball, Handball, Hockey, Cricket, Bocce & Unified Basketball [CWSN (Children With Special Needs - Divyang)]

3. Procedure for Asanas, Benefits & Contraindication for any two Asanas for each lifestyle disease.
 - Obesity • Diabetes • Asthma • Hypertension • Back Pain

Chapter 1

Assignment 1

Very short Answers Questions

Do all objective types questions given in your text- book.

Short Answers Questions 3 Markers

1. Discuss the pre games responsibilities of officials of various committees.
2. Discuss the objectives of planning in sports.
3. What is the importance of tournament? Discuss any three points.
4. List the steps to form various committees for tournament.
5. Explain the advantages and disadvantages of knock-out tournament.
6. Discuss various types of tournament.
7. Explain the advantages and disadvantages of league tournament.

Long Answers Questions 5 Markers

1. Explain the types, merits and demerits of league tournament.
2. Enlist the committees for organising sports events and explain any eight committees in detail.
3. Explain the pre, during and post game responsibilities of officials of various committees for organising a sports tournament smoothly.

Chapter 1

Assignment 2

Short Answers Questions 3 Markers

1. Discuss method of fixing byes in knock-out tournament.
2. Draw a fixture of 18 teams on knock-out basis.

Long Answers Questions 5 Markers

1. Being sports captain of school, prepare five important committees with their responsibilities to conduct one day Run for Health Race.
2. What do you mean by specific sports programmes? Explain in detail.
3. Mention all calculations and steps involved to draw a knock-out fixture of 25 teams, where 4 teams are to be seeded.