HOLIDAYS HOME WORK DURING SUMMER VACATION - 2019	
XII-ECONOMICS	
INDIAN ECONOMIC DEVELOPMENT-I (TO LEARN)	
1	Indian Economy on the eve of Independence
2	Five Year Plans in India : Goals and Achievements
MACRO ECONOMICS-II (TO LEARN)	
1	Introduction Macroeconomics
2	Some basic concepts of Macroeconomics
3	National Income and Related Aggregates
4	Methods of Calculating National Income
WRITE IN NOTE BOOK/ HOME WORK	
1	20 NEMERICAL QUESTIONS OF PRODUCTION/VALUE ADDED METHOD
2	20 NEMERICAL QUESTIONS OF INCOME METHOD
3	20 NEMERICAL QUESTIONS OF EXPENDITURE METHOD
4	40 MCQ PREPARED & LEARN
5	ALL NCERT QUESTIONS

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CLASS- XII B

SUBJECT- ACCOUNTANCY

- Prepare a project on Comprehensive question as discussed in class.
- Practice of all additional questions of chapter 1 &2 in homework notebook.
- **Part- B Analysis of financial statements**:   learn Format of Balance sheet and also write in your homework notebook
- Also revise the syllabus for monthly test in July.
- Practice the questions of chapter 1 & 2 that has been asked in Board exams of Last three years.

SUBJECT- BUSINESS STUDIES

- Prepare project on Topics (i) PRINCIPLES OF MANAGEMENT
                                (ii) BUSINESS ENVIRONMENT
  As per topic allotted in class.
- Do questions of chapter-3 & 4 in your notebook.

- Do practice of CASE STUDIES of chapter 1 to 4 in notebook.
- Practice of last 3 years questions paper of CBSE BOARD EXAM.
- Revise the syllabus for monthly test in July.
- Prepare mind map of chapters 1 to 4 .

KENDRIYA VIDYALAYA NO. 4 AMBALA CANTT

Holidays Homework

CLASS-XII

SUBJECT-BIOLOGY

Instructions: Do these questions in your Home Work note & learn them.

Q.1 – Name the phenomenon and one bird where the female gamete directly develops into a new organism.   1

Q.2- Write the location and function of sertoli cells in humans.   1

Q.3- - Differentiate between meiocyte and gamete in respect to chromosome no.   1

Q.4- Why is apple called a false fruit ? Which part of the flower forms the fruit ?   1

Q.5- Define parthenocarpy & give one example for it.   1

Q.6- Where is it acrosome present in human being ? write its function.   1

Q.7-Name the embryonic stage that gets implanted in the uterine wall of a human wall . Draw diagram for it .   2

Q.8-differentiate between spermiogenesis and spermiation.   2

Q.9- What is MTP? Why are MTPs carried out . Explain its significance.   2

Q.10- Draw a diagram of T.S. of anther and also labelled Tapetum,middle layers,endothecium & Sporogenous tissue .   2

Q.11- Placenta acts as endocrine tissue. Justify.   2

Q.12- Explain the devices that prevents autogamy and geitonogamy in flowering plants .   2

Q.13 - An anther with malfunctioning tapetum often fails to produce viable male gametophyte. Give reason.   2

Q.14-- How is zygote differs from zoospore ?   2

Q.15- Explain the stages of monosporic development of female gametophyte with the help of diagram. Also draw the diagram of mature female gametophyte.   3

Q.16- Differentiate between Oestrous and Menstrual cycle with examples.   3

Q.17- Which part of Banana, Potato, Bryophyllum, Agave ,Ginger And Water hyacinth used for vegetative propagation ?   3

Q.18- Draw a diagram of anatrous ovule with any six labelling.   3

Q.19- Differentiate between spermatogenesis & oogenesis with diagrams ,stages and chromosome no.   3

Q.20- Name the technological device to enable couples to have children fails to get child due to any reproductive disorder. Explain any three techniques for it.   3

Q.21-(a) Explain changes of hormones ,uterine wall & growth of follicles during menstrual cycle with the help of graphical representation.

(b) Explain the methods of birth control.   3+2=5

Q.22-(a) Define juvenile phase , reproductive phase and senescence phase .

(b) Draw the diagram of albuminous seed.   3+2=5

Q.23- (a) Describe double fertilization in flowering plants.

(b) Draw the diagram of monocot embryo and labelled it.   3+2=5

 Q.24- Expand the following.   5

A. IVF-ET   **B. GIFT**   **C. ICSI**   **D. AI**   **E. IUDs**

F.ZIFT   **G.RTIs**   **H. IUCDs**   **I.IUT**   **J. ART**

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KENDRIYA VIDYALAYA NO. 4 AMBALA CANTT

Holidays Homework

CLASS-XII

SUBJECT-BIOLOGY

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Multiple Choice Questions.

1. A few statements describing certain features of reproduction are given below:

i. Gametic fusion takes place   ii. Transfer of genetic material takes place
iii. Reduction division takes place   iv. Progeny have some resemblance with parents
Select the options that are true for both asexual and sexual reproduction from the options given below:

 (a) i and ii;   (b) ii and iii;   (c) ii and iv;   (d) i and iii.

2. The term 'clone' cannot be applied to offspring formed by sexual reproduction because:
a. Offspring do not possess exact copies of parental DNA

b. DNA of only one parent is copied and passed on to the offspring

c. Offspring are formed at different times

d. DNA of parent and offspring are completely different.

3. Amoeba and Yeast reproduce asexually by fission and budding respectively, because they are:

a. Microscopic organisms   b. Heterotrophic organisms

c. Unicellular organisms   d. Uninucleate organisms.

4. A few statements with regard to sexual reproduction are given below:

i. Sexual reproduction does not always require two individuals

ii. Sexual reproduction generally involves gametic fusion

iii. Meiosis never occurs during sexual reproduction

iv. External fertilisation is a rule during sexual reproduction

Choose the correct statements from the options below:

(a) i and iv   (b) i and ii   (c) ii and iii   (d) i and iv

5. A multicellular, filamentous alga exhibits a type of sexual life cycle in which the meiotic division occurs after the formation of zygote. The adult filament of this alga has

a. haploid vegetative cells and diploid gametangia   b. diploid vegetative cells and diploid gametangia

c. diploid vegetative cells and haploid gametangia   d. haploid vegetative cells and haploid gametangia

6. Among the terms listed below, those that of are not technically correct names for a floral whorl are:

i. Androecium   ii. Carpel   iii. Corolla   iv. Sepal

(a) i and iv,   (b) iii and iv   (c) ii and iv   (d) i and ii.

7. Embryo sac is to ovule as _____ is to an anther.

a. Stamen   b. Filament   c. Pollen grain   d. Androecium

8. In a typical complete, bisexual and hypogynous flower the arrangement of floral whorls on the thalamus from the outermost to the innermost is:

a. Calyx, corolla, androecium and gynoecium   b. Calyx, corolla, gynoecium and androecium

c. Gynoecium, androecium, corolla and calyx   d. Androecium, gynoecium, corolla and calyx

9. A dicotyledonous plant bears flowers but never produces fruits and seeds. The most probable cause for the above situation is:

a. Plant is dioecious and bears only pistillate flowers

b. Plant is dioecious and bears both pistillate and staminate flowers

c. Plant is monoecious

d. Plant is dioecious and bears only staminate flowers.

10. The outermost and innermost wall layers of microsporangium in an anther are respectively:

a. Endothecium and tapetum   b. Epidermis and endodermis

c. Epidermis and middle layer   d. Epidermis and tapetum

11. Choose the incorrect statement from the following:

a. In birds and mammals internal fertilisation takes place

b. Colostrum contains antibodies and nutrients

c. Polyspermy is prevented by the chemical changes in the egg surface

d. In the human female implantation occurs almost seven days after fertilisation

12. Identify the wrong statement from the following:

a. High levels of estrogen triggers the ovulatory surge.

b. Orgonial cells start to proliferate and give rise to functional ova in regular cycles from puberty onwards.

c. Sperms released from seminiferous tubules are poorly motile / non-motile.

d. Progesterone level is high during the post ovulatory phase of menstrual cycle.

13. Spot the odd one out from the following structures with reference to the male reproductive system:

a. Rete testis   b. Epididymis   c. Vasa efferentia   d. Isthmus

14. Seminal plasma, the fluid part of semen, is contributed by.

i. Seminal vesicle   ii. Prostate   iii. Urethra   iv. Bulbourethral gland

(a) i and ii   (b) i, ii and iv   (c) ii, iii and iv   (d) i and iv

15. Spermiation is the process of the release of sperms from:

a. Seminiferous tubules   b. Vas deferens   c. Epididymis   d. Prostate gland

16. The method of directly injecting a sperm into ovum in assisted by reproductive technology is called:

a. GIFT   b. ZIFT   c. ICSI   d. ET

17. Increased IMR and decreased MMR in a population will:

a. Cause rapid increase in growth rate   b. Result in decline in growth rate

c. Not cause significant change in growth rate   d. Result in an explosive population/exp

18. Intensely lactating mothers do not generally conceive due to the:

a. Suppression of gonadotropins   b. Hyper secretion of gonadotropins

c. Suppression of gametic transport   d. Suppression of fertilisation

19. Sterilisation techniques are generally fool proof methods of contraception with least side effects. Yet, this is the last option for the couples because:

i. It is almost irreversible   ii. Of the misconception that it will reduce sexual urge/drive

iii. It is a surgical procedure   iv. Of lack of sufficient facilities in many parts of the country

Choose the correct option:

(a) i and iii   (b) ii and iii   (c) ii and iv   (d) i, ii, iii and iv

20. A national level approach to build up a reproductively healthy society was taken up in our country in:

a. 1950s   b. 1960s   c. 1980s   d. 1990s

XII (Computer Science and Informatics Practices)

1. WRITE A PROGRAM THAT RETURNS TRUE IF INPUT NUMBER IS AN EVEN NUMBER, FALSE OTHERWISE
2. WRITE PROGRAM THAT READS DATE IN FORMAT <MMDDYYYY> AND PRINT THE DATE IN FORMAT <MONTH NAME, DAY, YEAR>.
3. WRITE PROGRAM TO FIND THE LARGEST ELEMENT OUT OF THREE NUMBERS.
4. WAP TO PRINT MULTIPLICATION TABLE
5. WAP TO PRINT

   1

   22

   333

   4444
6. WAP TO PRINT STAR PATTERN OF OPPOSITE RIGHT ANGLE TRIANGLE.

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7. WAP TO PRINT MULTIPLICATION TABLE CODE
8. WAP TO PRINT FIBONACCI SERIES USE WHILE LOOP
9. WAP TO PRINT PATTERN

   A

   AB

   ABC
10. WAP TO CALCULATION OF X^N BY FOR LOOP
11. WAP TO PRINT THE INTEGER IS PALINDROME OR NOT PALINDROME
12. WAP AREA OF RECTANGLE
13. WAP TO PRINT FACTORIAL OF LIST
14. WAP TO PRINT PASCAL TRIANGLE
15. WAP TO CREATE A LIST OF VALUES INPUTTED BY USER
16. WAP TO CREATE A LIST OF VALUES INPUTTED BY USER AND SORT IN INCREASING ORDER
17. SORTING IN ACCENDING ORDER USE BUBBLE SORT
18. WAP IN PYTHON TO CREATE A PHONE DICTIONARY
19. WAP TO FIND GIVEN NUMBER IS PRIME OR NOT
20. WAP TO CREATE A TUPLE OF VALUES INPUTED BY USER
21. WAP TO REVERSE AN INTEGER
22. WAP FOR ADDING TWO LIST ELEMENTS
23. WAP TO FIND LONGEST STRING FROM LIST
24. WAP TO ADD ALL ELEMENTS WITHIN LIST
25. Create a dictionary containing names of competition winner students as keys and number of their wins as values.
26. Write a program that receives two numbers in a function and returns the results of all arithmetic operations on these numbers.
27. Write a function to swap the values of two variables through a function.
28. Write a random number generator using functions that generates random numbers between 1 and 6 (simulates a dice).

Physics summer Vacation holiday home work class XII A

1.Do all the questions of ncert text book of chapter 1 and 2
2.write 20MCQs of chapter 1 and 10MCQs of chapter 2 with explanation
3. Do all the holidays Home work in home work notebook.

HOLIDAY HOMEWORK FOR SUMMER BREAK CLASS 12

CHEMISTRY:

Prepare a project report in not less than 25 pages in the following topics or any topic pertaining to class XII chemistry syllabus.

1. Determination of caffeine content in various tea samples.

 2. Analysis of alloys

3. Sterilization of water

 4. Topics related with green chemistry

 5. Preparation of soap and comparing its foaming capacities

 6. Corrosion and influence of sea water on corrosion

7. Determination of TFM in soaps

8. Presence of pesticides and insecticides in fruits and vegetables.

9. Determination of hardness of water

10. Effect of phosphates present in detergents.

11. Study of rate of diffusion.

 12. Preparation of dyes.

 13. Study of adulterants in food samples

 14. Study and preparation of natural indicators

 15. Chromatography.

16. Any other relevant project

Note:

 The project report should necessarily contain the following heads.

a. Introduction

b. Aim and objective

c. Materials required

d. Content / Procedure

e. Result / Conclusion

Class XII Assignment (Solutions)

1. State Henry's Law. What are the applications of Henry's Law?

2. What factors affect the solubility of gas in a liquid?

3. State Raoult's law for a binary solution containing volatile components.

4. Define an ideal solution. State the characteristics of ideal solution.

5. What type of solution is formed by mixing equal volumes of n- hexane and n-heptane or bromoethane and chloroethane or benzene and toluene? Explain.

6. What are non ideal solutions? Give examples.

7. Give one example each of miscible pairs showing positive and negative deviations from Raoult's Law. Give reasons for such deviations. (or) Explain with a suitable diagram and appropriate examples why some non ideal solutions show positive deviation from ideal behaviour.(or)What are non ideal solutions?

8. What role does intermolecular interaction play in deciding the vapour pressure of solutions (i) alcohol and acetone (ii) chloroform and acetone. (or) Draw a suitable diagram to express the relationship of ideal solutions of A and B between vapour pressures and mole fractions of components at constant temperature.

9. What are azoetropes? Classify them with examples.

10. What do you understand by colligative properties?

11. How is relative lowering of vapour pressure defined for a solution containing a volatile solvent and a non volatile solute? How is this function related to mole fraction of the solute and the solvent? (or)What is relative lowering of vapour pressure? Derive an expression for it. How is it useful in determining molecular mass of solute?

12. The solution of a non volatile solute boils at a higher temperature than the pure solvent. Show this relationship on a graphic diagram. (or) Why is the boiling point of solvent elevated when a non volatile solute is added to it?

13. With the help of a neat diagram, indicate why the solution of a non volatile solute should freeze at a temperature lower than the freezing point of the pure solvent? (or) Why is the freezing point of a solvent be depressed when a non volatile solute is added to it?

14.How can you say that osmotic pressure is a colligative property? How can it be used to determine the molecular mass of a non volatile solute?

15.What is meant by abnormal molecular mass of solute? Discuss the factors which bring abnormality in the experimentally determined molecular masses of solutes using colligative properties.

16. What is Van't Hoff factor?

17.Define the following terms. Mass percentage, Mass percentage, Mass by volume percentage, Parts per million, Mole fraction, Molarity, Molality.

18. What are isotonic solutions?

19.Define the term solution. How many types of solutions are formed? Write briefly about each type with an example.

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

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

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

23.Suggest the most important type of intermolecular attractive interaction in the following pairs. a. n-hexane and n-octane (ii) I2 and CCl4 (iii) NaClO4 and water (iv) methanol and acetone (v) acetonitrile (CH3CN) and acetone (C3H6O)

. 24.Based on solute-solvent interactions, arrange the following in order of increasing solubility in noctane and explain. Cyclohexane, KCl, CH3OH, CH3CN.

25.Amongst the following compounds, identify which are insoluble, partially soluble and highly soluble in water? (i) phenol (ii) toluene (iii) formic acid (iv) ethylene glycol (v) chloroform (vi) pentanol.

26.What are the advantages of using Osmotic property to determine molecular mass of solids over other colligative properties?

27.What do you mean by boiling point elevation constant (ebulloscopic constant) and freezing point depression constant (cryoscopic constant) for a solvent.

28.What is the effect of temperature on molality and molarity?

Concept Based Questions

1. Why does molality of a solution remain unchanged with temperature while molarity changes? (or) Why is it advantageous to use molality over molarity?

2. Two liquids boil at 145°C and 190° respectively. Which one has a higher vapour pressure at 80°C? 3. What would be the Van't Hoff factor of $K_3[Fe(CN)_6]$, K_2SO_4, $K_4[Fe(CN)_6]$, $Mg\ SO_4$, NaCl, KCl?

4. O f 0.1 molal solutions of glucose and sodium chloride respectively, which one will have a higher boiling point

5. A and B on mixing produced a warm solution. What type of deviation is there and why? (or) Why is an increase in temperature observed on chloroform and acetone.

6. When 30 ml of ethyl alcohol and 30 ml of water are mixed, the volume of resulting solution is more than 60 ml. Explain.

7. 10 ml of liquid A was mixed with 10ml of liquid B. The volume of the resulting solution was found to be 19.9 ml. What would you conclude?

8. A and B on mixing produced a colder solution. What type of deviation is there and why?

9. Why is the elevation of boiling point of water different in 0.1 molar NaCl solution and 0.1 molar sugar solution?

10. Which will have higher boiling point, 0.1M NaCl or 0.1M $BaCl_2$?

11. Solution A is obtained by dissolving 1g of glucose in 100g of water and solution B by dissolving 1 g of urea in 100g of water. Which will have a higher boiling point and why?

12. Why is cooking temperature in a pressure cooker higher than in a open pan?

13. When is the value of Van't Hoff factor greater than 1 and less than 1?

14. In determination of molar mass of A+B - , using colligative property, what may be the value of Van't Hoff factor if the solute is 50% dissociated?

15. Give an example of a compound in which hydrogen bonding results in form of dimer?

16. Give an example of a solution containing a solid in solid solvent.

17. What is anti freeze? (or) Why is it advised to add ethylene glycol in a car radiator while driving in hill station?

18. What is de- icing agent? Sodium chloride or calcium chloride is used to clear snow from roads. Why?

19. What happens when RBCs are placed in a) 1% NaCl solution b) 0.5% NaCl solution 20. What happens when blood cells are placed in pure water?

20. Which has the highest freezing point? i) 1 M glucose b) 1 M NaCl c) 1 M CaCl2 d) 1 M AlF3

21. When 20g of naptholic acid ($C_{11}H_8O_2$) is dissolved in 50g of benzene (Kf = 1.72KKg/mol) a freezing point depression of 2K is observed. The van't Hoff factor is a) 0.5 b) 1 c) 2 d) 3

22. Vapour pressure of water at 20˚C is 17.5 mm Hg. If 18 g of glucose is addded to 178.2g of water at 20˚C, the vpou pressure of the resulting solution will be a) 17,325 mm Hg b) 17.675mm Hg c) 15.75mm Hg d) 16.5mmHg

23. Two liquids X nd Y form ideal solutions. The mixture has a vapour presssure of 400mm at 300K when mixwd in the molar ratio of 1:1 and a vapour pressure of 350mm of Hg when mixwd in the molar ratio of 1:2 at the same temperature. The vapou pressure of two pure liquids are a) 250 mm, 550mm b) 350mm , 450mm c) 550mm. 700mm d) 550mm, 500mm e) 550mm.

24. A binary solution is prepared by mixig n- heptane an ethanol. Which statement is true regarding the behaviour of the solution. a) The solution is an ideal solution b) The solution is non ideal showing poitive deviation from Raoult's law. c) The solution is non ideal showing negative deviation from Raoult's law d) n-heptane shows positive deviation while ethanol shows negative deviation from Raoult's law

25. Two liquids X and Y form an ideal solution. At 300 K vapour presssure of a solution containing 1 mol of X nd 3 mol of Y is 550 mm Hg. At the same teperature,, if 1mol of Y is futher added to the solution, vapour presssure increases by 10 mm Hg. Vapou pressure in mm Hg of X and Y in the pure state will be a) 200 , 300 b) 300, 400 c) 400, 600 d) 500, 600.

26. The Henry's Law constant for solubility of N2 gas in water at 298K is 1x 105 atm. The mole fraction of N2 in air is 0.8. The number of moles of N2 from air dissolved in 10 moles of water at 298 K and 5 atm pressure is a) 4x 10-4 b) 4x 10-5 c) 5 x 10-4 d) 4x 10-6

27.. If sodiumsulphate is consiered to be completely dissociated into cations and anions in aqueous solution, the change in freezing point of water, when 0.01 mol of sodium sulphate is dissolved in 1 Kg of water (Kf = 1.86 KKg/mol) a) 0.0744 K b) 0.0186 K c) 0.0372 K d) 0.0558 K

28. On mixing heptane and octane they form an ideal solution at 373 K the vapour pressures of heptane and octane are 105 kPa and 45 kPa respectively. Vapour pressure of the solution obtained by mixing 25g heptane and 35g of octane will be a) 96.2 kPa b) 144.5 kPa c) 72 kPa d) 36.1 kPa

29. An aqueous solution is 1.00 molal in KI. Which change will cause vapour pressure of solution to increase? a) Addition of NaCl b) Addition of sodium sulphate c) Addition o 1.00 molal KI d) Addition of water

30. A solution of sucrose(342g/mol) has been prepared by dissolving 68.5 g of sucrose in 1000 g of water. The freezing point of the solution will be (Kf = 1.86 KKg/mol) a) -0.372˚C b) -0.52˚C c) 0.3772 ˚C d) -0.57 ˚C

Numericals

1. A solution to be used in hand lotion is made by mixing 90.0g of water, 9.2g of ethyl alcohol and and 18.4g of glycerol (C3H8O3). Calculate the mole fraction of glycerol present in it. (0.037)

2. The density of 10% by mass of KCl solution is 1.06g/cc. Calculate molarity of the solution. (1.42M) 3. Find the molarity of the solution obtained by miximg 100mL of 0.3M H2SO4 and 200mL of 1.5M H2SO4 (1.1M)

4. What volume of 96% of H2SO4 solution (density = 1.83g/mL) is required to make 4 litres of 3M H2SO4? (669 mL of diluted to 4 litres).

5. Methanol and ethanol form nearly an ideal solution at 300K. A solution is made by mixing 32g methanol and 23g ethanol. Calculate the partial pressures of the components and total vapour pressure of solution at 300K. (90 mmHg, 17mmHg, 77mm Hg)

6. Vapou pressures of pure benzene and toluene at 293 K is 75mm Hg and 22 mm Hg repecively.

7. . Vapour pressure of pure benzene and toluene at 293 K is 75 mm Hg and 22 mm Hg respectively. 23.4 g of benzene and 64.4 g of toluene are mixed. If the two form an ideal solution, calculate the mole fraction of benzene in the vapour phase assuming that the vapours are in equilibrium with the liquid mixture at this temperature. (0.59)

8. 18.2 g of urea is dissolved in 100g of water at 50ºC. The lowering of vapour pressure produced is 5mm Hg. Calculate the molecular mass of urea. The vapour pressure of water at 50ºC is 92 mm Hg. (57.05)

9..The vapour pressure of dilute aqueous solution of glucose is 750 mm Hg. Calculate (i)molality (ii) mole fraction of solute. (0.74m ; 0.0132)

10. The boiling point of water becomes becomes 100.52 50ºC. If 1.5 g of a non volatile solute is dissolved in 100 mL of it. Calculate the molecular mass of the solute. (Kb = 0.6k/m) (17.3)

11. 10 g of a non volatile solute when dissolved in 100g of benzene raises its boiling point by 1ºC. What is the molecular mass of the solute? (253)

12. The osmotic pressure of a dilute aqueous solution of a compound X containg 0.12g per litre is twice the osmotic pressure of a dilute aqueous solution of another compound Y containing 0.18g per litre. What is the ratio of the molecular mass of X to Y if both remain in molecular form in solution? (1:3)

13. 1 liter aqueous solution of sucrose weighing 1015 g has an osmotic pressure of 4.82 atm at 293 K. What is the molality of sucrose solution? (0.2112m)

14. Assuming completeionisation, calculate the expected freezing point of solton prepared by adding Glauber's salt $Na_2SO_4.10H_2O$ in 0.1Kg of water? Kf = 1.86 K Kg/mol. (271.95)

15. A solution contains 7.45 KCl per litre of the solution, It has an osmotic pressure of 4.68 atm at 300 K. Calculate the degree of dissociation of KCl in this solution. (90%)

16. Calculate the Van't Hoff factor of $CdSO_4$ (mol. Mass = 208.4) if the dissociation of 5.21 g of it in half liter of water gives a depression in freezing point of 0.168ºC (Kf = 1.86 K Kg/mol.) (1.806)

17. A solution of sucrose has been prepared by dissolving 68.4 g of sucrose in 1 Kg of water. Calculate i) Vapou pressure of the solution at 198 K ii) osmotic pressure of solution at 298 K iii) freezing point of the solution. (Kf = 1.86 K Kg/mol.) (0.-239 atm, 4.887 atm -0.372 ºC)

18. Calculate the amount of ethlene glycol to be added to 4 Kg of water to prevent it from freezing at -6 ºC (804.32)

19. The freezing point of a solution containing 0.3g of acetic acid in 30.0 g of benzene is lowered by 0.45 ºC. Calculate van't Hoff factor.(Kf = 5.12 K Kg/mol.) (

20. How much urea should be dissolved in 50g of water so that the vapour pressure at room temperature is reduced to 25%. Calculte molality of solution obtained. (55.56g: 18.2)

21. An aqueous solutin containing 1.24 g of barium chloride in 100g of water boils at 100.0832 ºC. Calculte the degree of dissociaton of barium chloride. (Kb = 0.52 K Kg/mol) (0.835)

22. The osmotic pressure of 0.013 molar solution of an electrolyte is found to be 0.70 atm at 27 ºC. Calcolate the van't Hoff factor. (2.76)

23. 2g of C_6H_5COOH dissolved in 25g of benzene shows a depression in freezing point equal to 1.62 K. What is the percentage association if it exists as a dimer? (Kb = 4.9 K Kg/mol) (99.2%)

24. 45 g of ethylene glycol $C_2H_6O_2$ is mixed with 600g of water. Calculate i) Freezing point depression ii) freezing point of the solution. Kf = 1.86 K Kg/mol (2.25 ºC : -2.25 ºC)

25. Find the amount of 98% pure Na_2CO_3 required to prepare 5 litres of 2N solution. (540.8g)

KENDRIYA VIDYALAYA NO. 4 AMBALA CANTT.

Class XII Assignment

Electrochemistry Assignment

1. Differentiate between Galvanic cell and electrolytic cell

2. How would you determine the standard electrode potential of the system $Mg^{2+}|Mg$

3. Depict the galvanic cell in which the reaction takes place. Further show:

$$Zn(s)+2Ag^+(aq) \rightarrow Zn^{2+}(aq)+2Ag(s)$$
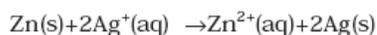
    (i)   Which of the electrode is negatively charged?
    (ii)   (ii) The carriers of the current in the cell. (iii)

     Individual reaction at each electrode.

4. How is electrode potential different from cell potential

5. Describe the construction and working of standard hydrogen electrode.

6.   What is the purpose of salt bridge placed between two half cells of a galvanic cell?
7.   Give the representation of the Daniel cell.
8. Define resistivity and conductivity.

9.   What is cell constant? How is it determined?
10. What are the problems faced in measuring R of ionic solutions and how are they overcome

11.Differentiate between metallic and electrolytic conduction.

12. Define the terms conductivity and molar conductivity for solution of an electrolyte. Discuss their variation with concentration.

13. What is the unit of molar conductivity?

14. What is limiting molar conductivity?

15. Describe the characteristics of variation of molar conductivity with dilution for a) strong electrolyte b) weak electrolyte. (or) With the help of a graph explain why it is not possible to determine the limiting molar conductivity for a weak   electrolyte by extrapolating the concentration-molar conductance   curve as for strong electrolytes. (or) Express the relationship between degree of dissociation of an electrolyte and its   molar conductivities.

16. How is molar conductivity of a weak electrolyte at infinite dilution determined? (or)   State

    Kohlrausch's Law. Write two applications.

17. How will you determine Λ_m^0 for water

18. State Faraday's Laws of Electrolysis.

19. What is the difference between primary cell and secondary cell?

20. Describe the Lechlanche cell with reference to electrodes used and reactions occurring at electrodes.

21. Describe the composition of anode and cathode in mercury cell. Write the electrode reactions

22. Write the cell reactions which occur in lead storage battery when battery is in use and when it is on charging

23. What is the reaction taking place in Nickel cadmium cell?

24. What are fuel cells? Suggest two materials other than hydrogen that can be used as fuels in fuel cell.

25. Describe the hydrogen fuel cell.

26. Rusting is an electrochemical process. Explain.

27. How can corrosion be prevented?

28. Account for the following

   a) Rusting of iron is quicker in saline water than in ordinary water. b) Alkaline medium inhibits the rusting of iron. c) Iron does not rust even if zinc coating is broken in a galvanized iron pipe.

29. Predict the products of electrolysis in each of the following:

   (i) An aqueous solution of $AgNO_3$ with silver electrodes. (ii) An aqueous solution of $AgNO_3$ with platinum electrodes. (iii) A dilute solution of H_2SO_4 with platinum electrodes. (iv) An aqueous solution of $CuCl_2$ with platinum electrodes.

30. Standard reduction potentials are given below

   $F_2/F^- = +2.9V$, $Ag^+/Ag = - 0.8V$, $Cu^+/Cu = +0.5V$ $Fe^{2+}/Fe = -0.4V$, $Na^+/Na= -2.7V$,

   $K^+/K= -2.9V$

   a) Arrange oxidizing agents in order of increasing strength   b) Which will oxidize Cu to Cu^+under standard conditions

31. Can you store copper sulphate solutions in a zinc pot?
32. Given the standard electrode potentials,

   $K^+/K = -2.93V$, $Ag^+/Ag = 0.80V$,
   $Hg^{2+}/Hg = 0.79V$
   $Mg^{2+}/Mg = -2.37$ V, $Cr^{3+}/Cr = - 0.74V$

   Arrange these metals in their increasing order of reducing power.

33. Arrange the following metals in the order in which they displace each other from the solution of their salts. Al, Cu, Fe, Mg and Zn.

34. Why is it necessary to platinize the electrodes of a conductivity cell before it is used for conductance measurement?

35. Suggest a list of metals that are extracted electrolytically.

Numericals

1. The conductivity of an aq. Solution of NaCl in a cell is 92×10^{-4} ohm^{-1}cm^{-1}. The resistance offered by the cell is 247.8ohm. Calculate the cell constant for the cell. (2.28/cm)

2. The conductivity of a solution containing 1g of anhydrous $BaCl_2$ in 200cm3 of the solution is found to be 0.0058S/cm. Calculate the molar conductivity of the solution. ($\lambda m = 241.28$Scm^2/)

3. The resistance of a 0.01M solution of KCl is 100Ω at 298 K. Calculate (1) conductance (ii) conductivity (iii) resistivity (10^{-2}, 10^{-2}, 100) $G^* = 1$cm^{-1}

4. 0.5 molar solution of a salt placed between platinum electrodes 2 cm apart and each of area of cross section 4cm^2 has a resistance of 25Ω. Calculate λm. (40)

5. Calculate the molar conductivity at infinite dilution of AgCl from the following data. $\Lambda^0 m$ AgNO$_3$ = 133.4, $\Lambda^0 m$KCl = 149.9, $\Lambda^0 m$ KNO$_3$ = 144.9 Scm^2/mol (138.45 Scm^2/mol)

6. The conductivity of 0.001 M acetic acid is 4.95×10^{-5} S/cm. Calculate the dissociation constant. $\Lambda^0 m$ = 90.5 Scm^2/mol. (1.85×10^{-5})

7. At 18 ºC, the conductivities at infinite dilution of NH4Cl, NaOH and NaCl are 129.8, 217.4 and 108.9 Scm^2/mol. If the equivalent conductivity of n/100 solution of NH$_4$OH is 9.93 Scm^2/eq, Calculate the degree of dissociation and dissociation constant at this dilution. (4.17%, 1.8×10^{-5})

8. Construct the cells in which the following reactions are taking place. Which of the electrodes act as anode and which as cathode?
   i) Zn + CuSO$_4$ →ZnSO$_4$ + Cu   ii) Cu + 2AgNO$_3$ → Cu(NO$_3$)$_2$ + 2Ag   iii) Zn + H$_2$SO$_4$ →ZnSO$_4$ + H$_2$ iv) Fe + SnCl$_2$ → FeCl$_2$ + Sn

9. Calculate the electrode potential at a copper electrode dipped in a 0.1 M solution of copper sulphate at 25ºC. The standard electrode potential of Cu^{2+}/Cu system is 0.34 V (0.31V)

10. What is a single electrode potential of a half cell for zinc electrode dipping in 0.01M zincsulphate solution at 25ºC.The standard electrode potential of Zn/Zn2+ system is 0.763 V. (0.8221V)

11. Calculate the emf of the cell. Mg/Mg^{2+}(1M)||Ag$^+$ (0.001M)|Ag   EºAg$^+$/Ag = 0.8V ; |EºMg^{2+}/Mg = -237V. What will be the effect on emf if concentration of Mg^{2+} is decreased to 0.1M? (3.013V; 3.022V)

12. To find the standard potential of M^{3+}/M electrode, the following cell is constituted. Pt| M/M^{3+}(0.00018M)||Ag$^+$ (0.01M)|Ag. The emf of this cell is found to be 0.42V. Calculate the standard potential of the half reaction M^{3+} +3e$^-$→M   EºAg$^+$/Ag = 0.8V (0.32V)

13. A zinc rod is dipped in 0.1M solution of ZnSO$_4$. The salt is 95% dissociated at this dilution at 298 K. Calculate the electrode potential given that EºZn^{2+}/Zn = -0.76V (-0.79V)

14. One half in a voltaic cell is constructed from a silver wire dipped in silver nitrate solution of unknown concentration. The other half cell of zinc electrode in 0.10M solution of $Zn(NO)_3$. A voltage of 1.48 is measured for this cell. Use this information to calculate the concentration of silver nitrate solution. $E^oZn^{2+}/Zn = -0.763V$; $E^oAg^+/Ag = 0.8V$ (0.0124M)

15. Calculate the pH of the half cell $Pt(H_2)1atm/H_2SO_4$, its oxidation potential is 0.4V (6.77)

16. Calculate the cell potential of the following concentration cell . $PtH_2(2atm)|H^+(0.M)||H^+(0.3M)| H_2(4atm)$ (0.019V)

17. For the reaction $Ni/Ni^{2+}||Ag^+ |Ag$ $E^oNi^{2+}/Ni = -0.25V$; $E^oAg^+/Ag = 0.8V$. Calculate the equilibrium constant at 25ºC. How much maximum work can be obtained by the operation of the cell? (3.98×10^{35}, 202650J)

18.Estimate the minimum potential difference needed to reduce Al_2O_3 at 500ºC. The free energy for decomposition reaction $2/3 Al_2O_3 \rightarrow 4/3 Al + O_2$ is 960KJ/mol

.

(2.847V)

19. How many molecules of chlorine will be liberated by electrolysis of an aqueous solution of NaCl in 1 minute by a current of 600mA?

20. How many hours does it take to reduce 3 moles of Fe^{3+} to Fe^{2+} with a 2 ampere current?

21. A current of 100 ampere is passed through a molten solution of molten NaCl for 5 hours. Calculate the volume of chlorine gas liberated at the anode at NTP?

CHEMICAL KINETICS

1. State a condition under which a bimolecular reaction is kinetically first order reaction.

2. Write the rate equation for the reaction $2A + B \longrightarrow C$ if the order of the reaction is zero

. 3. How can you determine the rate law of the following reaction? $2NO (g) + O2 (g) \longrightarrow 2NO2 (g)$

4. For which type of reactions, order and molecularity have the same value?

5. In a reaction if the concentration of reactant A is tripled, the rate of reaction becomes twenty seven times. What is the order of the reaction?

6. Derive an expression to calculate time required for completion of zero order reaction.

7. For a reaction $A + B \longrightarrow$ Products, the rate law is — Rate = k [A][B]3/2 Can the reaction be an elementary reaction? Explain.

8. For a certain reaction large fraction of molecules has energy more than the threshold energy, yet the rate of reaction is very slow. Why? Exemplar Problems, Chemistry

9. For a zero order reaction will the molecularity be equal to zero? Explain.

10. For a general reaction A $-\rightarrow$ B, plot of concentration of A vs time is given in Fig. 4.3. Answer the following question on the basis of this graph. (i) What is the order of the reaction? (ii) What is the slope of the curve? (iii) What are the units of rate constant?

11. The reaction between H2(g) and O2 (g) is highly feasible yet allowing the gases to stand at room temperature in the same vessel does not lead to the formation of water. Explain.

12. Why does the rate of a reaction increase with rise in temperature?

13. Oxygen is available in plenty in air yet fuels do not burn by themselves at room temperature. Explain.

14. Why is the probability of reaction with molecularity higher than three very rare?

15. Why does the rate of any reaction generally decreases during the course of the reaction?

16. Thermodynamic feasibility of the reaction alone cannot decide the rate of the reaction. Explain with the help of one example.

17. Why in the redox titration of KMnO4 vs oxalic acid, we heat oxalic acid solution before starting the titration?

18. Why can't molecularity of any reaction be equal to zero?

19. Why molecularity is applicable only for elementary reactions and order is applicable for elementary as well as complex reactions?

20. Why can we not determine the order of a reaction by taking into consideration the balanced chemical equation?

21. Define the term 'order of reaction' for chemical reactions.

22. Define 'order of a reaction'.

23. For a reaction **R → P**, half-life (**t1/2**) is observed to be independent of the initial

concentration of reactants. What is the order of reaction?

24. What is the effect of adding a catalyst on

(a) Activation energy (**Ea**), and

(b) Gibbs energy (ΔG) of a reaction?

25. A first order decomposition reaction takes 40 minutes for 30% decomposition.

Calculate its **t1/2** value.

26. What is meant by the 'rate constant' k' Of a reaction? If the concentration be

 expressed in mol **L−1** units and time in seconds. what would be the units for k

(i) for a zero order reaction and

(ii) for a first order reaction?

27. A reaction of second order with respect to a reactant. How will the rate of reaction

be affected if the concentration of this reactant is:

(i) Doubled,

(ii) Reduced to half?

28. A reaction of second order with respect to a reactant. How will the rate of reaction

be affected if the concentration of this reactant is

(i) Doubled,

(ii) Reduced to half?

29. A reaction is of first order in reactant A and of second order in reactant B. How is

 the rate of this reaction affected when (i) the concentration of B alone is increased to

 three times (ii) the concentrations of A as well as B are doubled?

30. Distinguish between 'rate expression' and 'rate constant' of a reaction.

31.Identify the reaction order from each of the following units of reaction rate constant:

 (i) $L^{-1}mol\ S^{-1}$

 (ii) $Lmol^{-1}\ S^{-1}$

32. The thermal decomposition of is a first order reaction with a rate constant

of at a certain temperature. Calculate how long will it take for threefourths of initial quantity of
to decompose. (log 0.25 = -0.6021).?

33. (a) For a reaction $A + B \longrightarrow P$, the rate law is given by, $r = [A]^{1/2}[B]^2$ What is the order of
this reaction.

 (b) A first order reaction is found to have a rate constant $k = 5.5 \times 10^{-14}S^{-1}$ Find the half-life
of the reaction.

34. (a) List the factors on which the rate of a chemical reaction depends.

(b) The half-life for decay of radioactive $C14$ is 5730 years. An archaeological

artefact containing wood has only 80% of the $C14$ activity as found in living trees.

Calculate the age of the artefact.

NOTE ATTEMPT ALL THE INTEXT\EXERCISE QUESTIONS OF NCERT

CHEMISTRY IN EVERY DAY LIFE ASSIGNMENT

Q.1. Differentiate between disinfectants and antiseptics.

Q.2. What are the products of hydrolysis of sucrose?

Q.3. What are biodegradable and non-biodegradable detergents? Give one example of

each class.

Q.4. While antacids and antiallergic drugs interface with the function of histamines but

why do there not interface with the function of each other?

Q.5. What are food preservatives? Name two such substances.

Q.6. Explain the following types of substances with one suitable example, For each case:

(i) cationic detergents.

(ii) Food preservatives.

(iii) Analgesics.

Q.7. What are analgesic medicines? How are they c1assifiedand when are they

commonly recommended for use?

Q.8. Describe the following giving one example for each:

(i) Detergents

(ii) Food preservatives

(iii) Antacids

Q.9. What are the following substances? Give on example of each one of them.

(i) Tranquilizers

(ii) Food preservatives

(iii) Synthetics detergents

Q.10. (a) Which one of the following is a food preservative?

Equanil, Morphine, Sodium benzoate

(b) Why is bithional added to soap?

(c) Which class of drugs is used in sleeping pills?

Q.11. (i) Give two examples of macromolecules that are chosen as drug targets.

(ii) What are antiseptics? Give an example.

(iii) Why is use of aspartame limited to cold foods and soft drinks?

Q.12. Define the following:

(i) Anionic detergents

(ii) Broad spectrum antibiotics

(iii) Antiseptic

Q.13. Mention one use each of the following drugs:

(i) Ranitidine

(ii) Paracetamol

(iii) Tincture of iodine.

Q.14. Describe the following substance with one suitable example of each type:

(i) Non-ionic detergents

(ii) Food preservatives

(iii) Disinfectants

Q.15. Explain the following terms with one example in each case:

(i) Food preservatives

(ii) Enzymes

(iii) Detergents

Q.16. Explain the term, target molecules or drug targets as used in medicinal

chemistry.

Q.17. (i) What class of drug is Ranitidine.

(ii) If water contains dissolved Ca2+ ions, out of soaps and synthetic detergents,

which will you use for cleaning clothes.

(iii) Which of the following is an antiseptic. 0.2% phenol, 1% phenol.

Q.18. Define the following:

(a) Anionic detergents

(b) Limited spectrum antibiotics

(c) Antiseptics

POLYMERS ASSIGNMENT

Q.1. Give an example of elastomers.

Q.2. Define biodegradable polymers?

Q.3. Devine the term 'Polymerization'.

Q.4. What does '6.6' indicate in the name nylon-'6.6'?

Q.5. How can you describe this designation 6, 6, mean in the name nylon -6, 6?

Q.6. Is (−CH2 − CH −)n a homopolymer or a copolymer.

Q.7. Which of the following is a natural polymer?

Buna-S, Proteins, PVC

Q.8 What is the repeating unit in the condensation polymer obtained by combining HO2

CCH2 CH2CO2H (succinic acid) and H2NCH2NH2 (ethylene diamine).

Q.9. Arrange the following polymers in increasing order of their intermolecular force:

(i) Nylon 6, 6, Buna-S, Polythene.

(ii) Nylon 6, Neoprene, Polyvinyl chloride.

Q.10. Draw the structure of the monomer for each of the following polymers:

(i) Nylon6

(ii) Polypropene

Q.11. What are thermoplastic and thermosetting polymers? Give one example of each.

Q.12. Differentiate between molecular structures and behaviors of thermoplastic and thermosetting polymers. Give one example of each type.

Q.13. Draw the molecular structures of the monomers of:

(i) PVC

(ii) Teflon

Q.14. Give the preparation and use of PVC (Polyvinyl Chloride)

Q.15. Define thermoplastic and thermosetting polymers. Give one example of each.

Q.16. What is a biodegradable polymer? Give an example of a biodegradable aliphatic polyester.

Q.17. Write the name of the monomers used for getting the following polymers:

(i) Bakelite

(ii) Neoprene

Q.18. Write the name and structures of the monomers of the following polymers:

(i) Terylene

(ii) PHBV

(iii) Neoprene

Q.19. Write the names and structures of the monomers of the following polymers

(i) Buna-S

(ii) Neoprene

(iii) Nylon-6

Q.20. Give one example each of.

(i) addition polymers,

(ii) condensation polymers,

(iii) copolymers.

Q.21. Write the names and structures of the monomers of the following polymers:

(i)Glyptal

 (ii)(Buna -S

(iii) Nylon-6, 6

Q.22. Write the name and structures of the monomers of the following polymers:

(i) Caprolactum

(ii) PHBV

(iii Buna- N

Q.23. Write the structure of the monomers used for getting the following polymers:
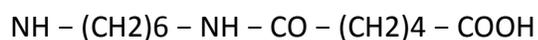
(i) Dacron

(ii) Melamine – formaldehyde polymer

(iii) Buna-N

Q.24. (i) What is the role of t-butyl peroxide in the polymerization of ethene?

(ii) Identify the monomers in the following polymer:

NH – (CH2)6 – NH – CO – (CH2)4 – COOH

(iii) Arrange the following polymers in the increasing order of their intermolecularforces:
Polystyrene, Terylene, Buna-S.

Q.25. Draw the structures of the monomers of the following polymers:
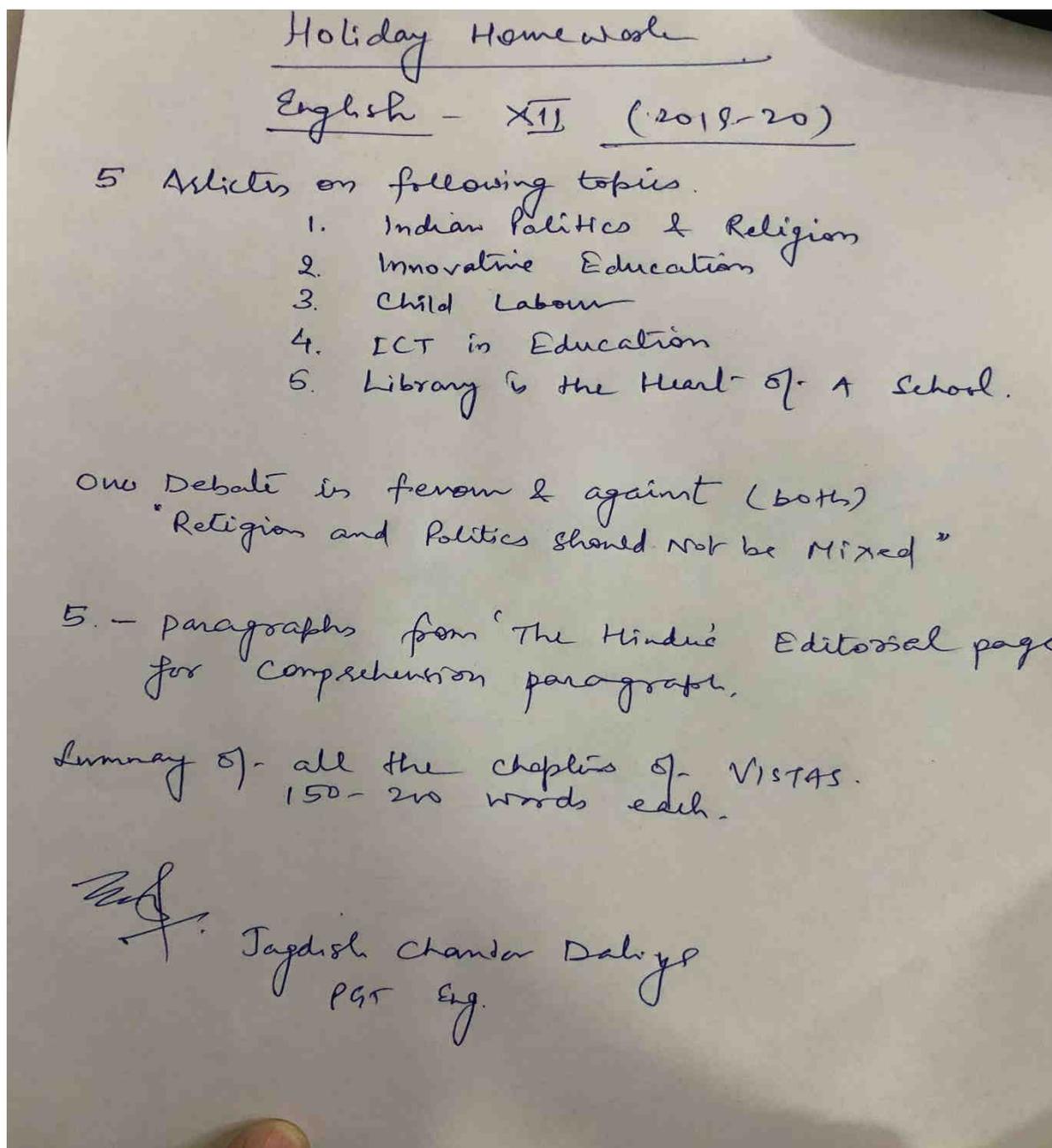
(i) Polythene

(ii) PVC

(iii) Teflon

Q.26. Differentiate between thermoplastic and thermosetting polymers. Give one example

of each.

Q.27. (i) What is the role of Sulphur in the vulcanization of rubber.

(ii) Identify the monomers in the following polymer:

(iii) Arrange the following polymers in the increasing order of their intermolecular

forces: Terylene, Polyethylene, Neoprene.

<u>Holiday Homework</u>

<u>English - XII (2019-20)</u>

5 Articles on following topics.
  1. Indian Politics & Religion
  2. Innovative Education
  3. Child Labour
  4. ICT in Education
  5. Library is the Heart of A School.

One Debate is fervour & against (both)
"Religion and Politics should Not be Mixed"

5. — paragraphs from 'The Hindu' Editorial page
  for Comprehension paragraph.

Summary of all the chapters of VISTAS.
  150 - 200 words each.

Jagdish chandar Daliyp
PGT Eng.

Maths (Class XII)

Chpater-3,4 (Matrices & Determinants)

Q1. Find the value of x, y, z if $\begin{bmatrix} x+y+z \\ x+z \\ y+z \end{bmatrix} = \begin{bmatrix} 9 \\ 5 \\ 7 \end{bmatrix}$

Q2. A matrix has 3 rows and 4 columns. How many elements a matrix has?

Q3. Given a matrix $A = [a_{ij}]$, $1 \le i \le 3$, $1 \le j \le 2$

Where $a_{ij} = \dfrac{4i - j}{5}$ write the element a22, a21, a34 & a12

Q4. A matrix has 20 elements, what are the possible orders of a matrix?

Q5. Find AB, if defined:

(a) $A = \begin{bmatrix} 1 \\ 2 \end{bmatrix}$, $B = \begin{bmatrix} 3 \\ 4 \end{bmatrix}$

(b) $A = \begin{bmatrix} 1 \\ 2 \end{bmatrix}$, $B = \begin{bmatrix} 3 & 4 \end{bmatrix}$

Q6. Solve for x: $\begin{bmatrix} 1 & x \end{bmatrix} \begin{bmatrix} 2 & -1 \\ 1 & 2 \end{bmatrix} \begin{bmatrix} 1 \\ 3 \end{bmatrix} = 0$

Q7. If points (a, b), (a1, b1) and (a-a1, b-b1) are collinear show that ab1 = a1b

Q8. Find the value of x, if $\begin{vmatrix} 2 & 4 \\ 5 & 1 \end{vmatrix} = \begin{vmatrix} 2x & 4 \\ 6 & x \end{vmatrix}$

Q9. How many values of k are possible, if area of a triangle with vertices (2, 0), (k, 5) (–1, 3) is 7 sq. units? Give reason.

Q10. For a given square matrix A, |A| = –4 and $A(adjA) = \lambda I$ Find the value of λ

Q11. Find matrix X such that:

A – 2B + X = 0 where A = $\begin{bmatrix} 5 & 3 \\ -3 & 1 \end{bmatrix}$; B = $\begin{bmatrix} 0 & -2 \\ 3 & 1 \end{bmatrix}$

Q12. Find the inverse of the matrix $\begin{bmatrix} 1 & 3 \\ 2 & 7 \end{bmatrix}$ using E.R.T.

Q13. If A = $\begin{bmatrix} 2 & 3 \\ 1 & 2 \end{bmatrix}$, prove that $A^3 - 4A^2 + A = 0$

Q14. Express the following matrix as the sum of a symmetric and a skew symmetric matrix:

$$\begin{bmatrix} 1 & 3 & 5 \\ -6 & 8 & 3 \\ -4 & 3 & 5 \end{bmatrix}$$

Q15. Find A^{-1} of matrix $A = \begin{bmatrix} a & b \\ c & \dfrac{1+bc}{a} \end{bmatrix}$ and show that $aA^{-1} = (a^2 + bc + 1)I - A$

Q16. Without expanding prove that $\begin{vmatrix} 1 & a & a^2 - bc \\ 1 & b & b^2 - ac \\ 1 & c & c^2 - ab \end{vmatrix} = 0$

Q17. Using properties of determinants, solve for x: $\begin{vmatrix} a+x & a-x & a-x \\ a-x & a+x & a-x \\ a-x & a-x & a+x \end{vmatrix} = 0$

Q18. P.T. (using properties)

$$\begin{vmatrix} a & b & c \\ a^2 & b^2 & c^2 \\ b+c & c+a & a+b \end{vmatrix} = (a+b+c)(a-b)(b-c)(c-a)$$

Q19. Solve (using properties)

$$\begin{vmatrix} x+4 & 2x & 2x \\ 2x & x+4 & 2x \\ 2x & 2x & x+4 \end{vmatrix} = 0$$

Q20. P.T.(using properties)

$$\begin{vmatrix} a & b & c \\ a-b & b-c & c-a \\ b+c & c+a & a+b \end{vmatrix} = a^3 + b^3 + c^3 - 3abc$$

Q21. Using matrix method, solve the following example:

$$2x + 6y = 2$$
$$3x - z = -8$$
$$2x - y + z = -3$$

Q22. If $A = \begin{vmatrix} 2 & -3 & 5 \\ 3 & 2 & -4 \\ 1 & 1 & -2 \end{vmatrix}$ Find A^{-1}, using A^{-1} solve,

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

Q23. If $A = \begin{bmatrix} 2 & 3 & 1 \\ 3 & -2 & 1 \\ 7 & -1 & 2 \end{bmatrix}$ Find A^{-1}. using A^{-1} solve,

$$2x + 3y + 7z = 12$$
$$3x - 2y - z = 0$$
$$x + y + 2z = 4$$

Q24. 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 to solve the system of eqs:

$$x - y + z = 4$$
$$z - 2y - 2z = 9$$
$$2x + y + 3z = 5$$

Q25. Solve:

$$5x + 3y + 7z = 4$$
$$3x + 26y + 2z = 9$$
$$2x + 2y + 10z = 5$$

Q26. Find inverse (using E.R.T.):

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

Q27. For the matrix $A = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 2 & -3 \\ 2 & -1 & 3 \end{bmatrix}$

Show that $A^3 - 6A^2 + 5A + 11I = 0$, hence find A^{-1}

Q28. Find the matrix A satisfying the matrix equation:

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

Q29. Solve:

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

Q30. Find inverse (using E.C.T.):