D.A.V PUBLIC SCHOOL
VASANT KUNJ
HOLIDAY HOMEWORK
CLASS XII (SCIENCE)

ENGLISH

Writing Skills

Question No. 3

a. Your school has planned an excursion to Lonavala near Mumbai during the autumn holidays. Write a notice in not more than 50 words for your school notice board, giving detailed information and inviting the names of those who are desirous to join. Sign as Naresh/Namita, Head Boy/Head Girl, D.V. English School, Thane, Mumbai.
b. You are Sunita/Sonu. You have cleared your IIT Entrance Examination. You wish to sell your IITJEE and Vidya Mandir practice material. Write an advertisement to be published in the classified column in not more than 40 words.
c. C.P. R. Senior Secondary School, Meerut is looking for a receptionist for the school. Draft an advertisement in not more than 50 words to be published in classified columns of Hindustan Times. You are Romola Sharma, principal of the school.
d. You are the Secretary of the Interact Club of Sardar Patel Vidyalaya. Prepare a poster, highlighting the disastrous effects of drug abuse.

Question No. 4

a. Your school Commerce Association organized a seminar for class XII students of the schools of your zone on the topic, 'Rising prices create a crisis'. As co-ordinator of the programme, write a report in 100-125 words for your school magazine. You are Piyush/Priya of ABC School, Agra.
b. You are Rachit Kumar, the Vice-Head boy of XYZ Public School. Draft a report on the Investiture Ceremony a School.
c. A new indoor gymnasium has recently been constructed and inaugurated at APJ International School at Goa. As special correspondent of 'The Hindu' draft a report in 100-125 words on the gymnasium and the inauguration ceremony.

Question No. 5

a. You are Rajat Kumar, a resident of 79, R.K.Puram, New Delhi. You are interested in joining the course in communication skills advertised by the Elite School of Language, South Extension. Write a letter of enquiry for the same.
b. You are Pritam/Priti, 27, W.E.A. Karol Bagh, Delhi. You have decided to shift your residence to Faridabad and hence decided to discontinue your membership of Brain Trust Library, Karol Bagh. Write a letter to the Librarian, requesting him to cancel your membership and refund your security deposit of Rs. 5000 explaining your inability to continue your membership.
c. You are Anu/Arun, 13 W.E.A. Karol Bagh, New Delhi. You feel very strongly about the ill-treatment meted out to stray dogs at the hands of callous and indifferent people. Write a letter to the editor of a national daily giving your views on why some people behave in such a manner and how these dogs should be treated.

Question No. 6

a. Youngsters these days are quite caught up with Online socializing groups like Facebook etc. As a sceptic and a rationalist write a magazine article for your school magazine in about 150-200 words weighing the pros and cons of such preoccupations of children. Do you think these portals are safe/ they intrude on an individual's privacy which oft late many have failed to realize by themselves.
b. Spurt of violence previously unknown in Indian schools makes in incumbent on educationists to introduce value education effectively in schools. Write an article in 150-200 words expressing your views on the need of value education. You are Anu/Arun.
c. On account of Women's Day on March 8, you have to deliver a speech on 'The new woman today'. You feel women today are highly empowered and progressive. They are breaking down typical male bastions and setting up newer/higher parameters of success for women of tomorrow in every sphere. Prepare this speech in 150-200 words.
d. Regular practice of yoga can help in maintaining good health and even in the prevention of so many ailments. Write a speech in 150-200 words to be delivered in the morning assembly on the usefulness of yoga.

Section C (Textbooks)

Question No. 9

Answer the following questions in about 30-40 words

a. Why is Mukesh content to dream only of cars and not of planes?
b. Why can't the bangle makers break their "God given lineage"?
c. What role did the parents and teachers play for the children's neglect of French language?
d. How does M.Hamel evoke feelings of patriotism in the class towards the end of the lesson?
e. The German development of synthetic indigo had an impact on India. How?
f. "He began by trying to get the facts." What different facts did he Gandhiji collect? What was the outcome?
g. Give any two instances from 'Indigo' that depict Gandhi's courage.

MATHEMATICS

Q.NO.1. By using properties of determinants Prove that

$$\begin{vmatrix} 8888 & 8889 & 8890 \\ 8891 & 8892 & 8893 \\ 8894 & 8895 & 8896 \end{vmatrix} = 0$$

Q.NO.2. Solve for x :

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

Q.NO.3. If

$$A = \begin{pmatrix} -4 & 4 & 4 \\ -7 & 1 & 3 \\ 5 & -3 & -1 \end{pmatrix} \qquad B = \begin{pmatrix} 1 & -1 & 1 \\ 1 & -2 & -2 \\ 2 & 1 & 3 \end{pmatrix}$$

Find the product AB and use it to solve the following system of equations:

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

Q.NO. 4. Using matrices solve the following system of equations:

$2/x + 1/y + 3/z = 1$
$1/x + 4/y + 6/z = 9$

4/x + 3/y + 9/z = 5

Q.No.5: If $\sqrt{1-x^2} + \sqrt{1-y^2} = a(x-y)$ then prove that

$dy/dx = \sqrt{1-y^2}/\sqrt{1-x^2}$

Q.No.6: If $e^x + e^y = e^{x+y}$ then prove that $dy/dx = -e^{y-x}$

Q.No.7: If $x^y = e^{x-y}$ then prove that $dy/dx = \log x / (1+\log x)^2$

Q.No.8: If $x^p . y^q = (x+y)^{p+q}$ then prove that $dy/dx = y/x$

Q.No.9: Prove that $d/dx \{ 2x \tan^{-1} x - \log(1+x^2) = 2 \tan^{-1} x$

Q.No.10: If $y = (\tan^{-1} x)^2$ then prove that

$(x^2+1)^2 y_2 + 2x(x^2+1) y_1 = 2$

Q.No.11: If $(\cos x)^y = (\cos y)^x$ then find dy/dx.

Q.No.12: If $y = a(\sin\theta - \theta\cos\theta)$ & $x = a(\cos\theta + \theta\sin\theta)$

then find d^2y/dx^2.

Q.No.13: If $y = e^x (\sin x + \cos x)$ then prove that

$y_2 - 2y_1 + 2y = 0$

Q.NO.14. Find the values of a & b such that the function defined by :

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

is continuous function.

Q.NO.15. Find the inverse of matrix by using elementary transformation:

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

Q.NO.16. **Verify Lagrange's mean value theorem for the function :**

$f(x) = (x-1)(x-2)(x-3)$ in the interval $[1, 4]$

Q.NO.17. **Differentiate the following:**

$$(1-2x)^{2/3}(1+3x)^{-3/4}$$

(a) $\sin x\, e^x \log x^x$ **(b)** ----------

$$(1-6x)^{5/6}(1+7x)^{-6/7}$$

Q.NO.18. **If**

$$y = e^t(\cos t - \sin t)$$

$$x = e^t(\cos t + \sin t) \quad \text{find} \quad d^2y/dx^2.$$

Q.NO.19. **If**

$$y = \tan^{-1}\left(\frac{4x}{1+5x^2}\right) + \tan^{-1}\left(\frac{2+3x}{3-2x}\right)$$

Prove that:

$$\frac{dy}{dx} = \frac{5}{1+25x^2}$$

Q.NO.20. **If**

$$\mathbf{A} = \begin{pmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{pmatrix}$$ **Prove that** $\mathbf{A^2 - 4A - 5I = 0}$

and hence obtain $\mathbf{A^{-1}}$

Q.No.21: If $x\sqrt{1+y} + y\sqrt{1+y} = 0$ then prove that $dy/dx = -1/(1+x^2)$

Q.No.22: If $\sqrt{1-x^6} + \sqrt{1-y^6} = a(x^3 - y^3)$ then prove that

$dy/dx = x^2\sqrt{1-y^6} / y^2\sqrt{1-x^6}$

Q.No.23: If $y = \log(\sqrt{x} + 1/\sqrt{x})$ then prove that

$dy/dx = x - 1 / 2x(x+1)$

Q.No.24: If $y = \log(x + \sqrt{x^2 + 1})$ then prove that

$(x^2 + 1)\, d^2y/dx^2 + x\, y_1 = 0$

Q.No.25: Differentiate $\sin^{-1}(1 - x^2 / 1 + x^2)$ w.r.t $\tan^{-1}(\sqrt{1+x^2} - 1 / x)$

PHYSICS

Q1) Draw a block diagram of:

a. Transmitter
b. Receiver
c. Amplitude Modulator
d. Demodulator

Q2) Draw the logic circuit diagram for:
NOT, OR, AND, NOR and NAND gates. Also write truth table and Boolean expression..

Q3) Draw a circuit diagram and explain the operation of a transistor as a switch.

Q4) Explain briefly, with the help of circuit diagram, how a p-n junction diode works as a half wave rectifier.

Q5) What is a light emitting diode? Mention two important advantages of LED, over conventional lamps.

Q6) Explain the principle on which a transistor – amplifier works as an oscillator. Draw the necessary circuit diagram and explain its working.

Q7) How is zener diode fabricated so as to make it a special purpose diode. Draw I-V characteristics of zener diode and explain the significance of breakdown voltage.

Q8) State Gauss's theorem. Derive an expression for electric field intensity due to a uniformly changed thin spherical shell at a point inside, outside and on the surface.

Q9) With the help of labelled circuit diagram, explain how an n-p-n transistor be used as an amplifier in common – emitter configuration.

Q10) Make a working project with a report based on any topic from your physics syllabus. Hint: Logic gates, Rectifier, Transformer, Electromagnetic Induction, Interference of light, Dispersion of light, Refractive index of the given medium.

CHEMISTRY

1. Do the chemistry Assignments based on the following Chapters:-
   a) The solid state
   b) Solutions
   c) Electrochemistry
2. Prepare Investigatory Project of Chemistry in the Vacation.
3. Revise and prepare chapters of Physical Chemistry for the cycle test in July
4. Make a power point presentation on the lesson allotted to you in the class.

The solid state

Q1) What makes the crystal of KCl appear sometimes violet ?

Q2) What happens when ferrimagnetic or ferromagnetic subsatance is heated to 850K and why?

Q3) Name one solid in which both schottkey and frenkel defect occur.

Q 4) What are f-centers?

Q5) An element occurs in bcc structure with cell edge 300 pm. The density of element is 5.2g/cm^3. How many atoms does 200g of the element contain? ($2.85*10^{24}$ atom)

Q6) If NaCl crystals are doped with $2*10^{-3}$ mol percent of $SrCl_2$, calculate the cation vacancies per mole.
($1.2046*10^{19}$ mol)

Q7) Metallic gold crystallizes in a fcc lattice and has a density of 19.3g/cm^3. Calculate the radius of gold atom.
(144.2pm)

Q8) An element has a bcc structure with a cell edge of 288 pm. The density of the element is 702g/cm^3. How many atoms are presentin208g of the element? ($2.416*10^{24}$ atom)

Q9) What is meant by anisotropy?

Q10) What is a semiconductor? Describe two main types of semiconductors and explain mechanism for their conduction.

Q11) Assign reason for the following:

1) Phosphorous doped silicon is a semiconductor.
2) Schottkey defect lowers the density of a solid.
3) Some of the very old glass objects appear slightly milky instead of being transparent,
4) Some of very old glass objects are thick at bottom.

Q12) Aluminum crystallizes in a ccp structure. Its metallic radius is 125pm.

1) What is the length of the side of the unit cell?
2) How many unit cells are there in 100 cm^3 of Al?

Q13) Determine the type of cubic lattice to which a given crystal belongs if it has edge length of 290pm and density is 7.80g/cm^3

SOLUTIONS

Q1) Two liquids A and B boil at 145^0C and 190^0C respectively. Which of them has a higher vapour pressure at 80^0C?

Q2) What is the expected value of Vant` Hoff Factor for

1) $K_3[Fe(CN)_6]$ 2) K_2SO_4 in dilute solution?

Q3) Of 0.1 molal solution of glucose and NaCl respectively, which one will have a higher boiling point?

Q4) A and B liquids on mixing produce a warm solution. Which type of deviation is there and why?

Q5) When 30ml of ethyl alcohol and 30ml of water are mixed, the volume of resulting solution is more than 60ml. Which type of deviation does it show? Give reason.

Q6) What would be the value of Vant` Hoff factor if a solute is 50% dissociated?

Q7) Why is the elevation in boiling point of water different in the following solutions?
1) 0.1 molar of NaCl solution 2) 0.1 molar sugar solution.

Q8) Mention a large scale use of the phenomenon of reverse osmosis.

Q9) What is the value of i if the solute molecules undergo
1) association 2) dissociation 3) neither association nor dissociation ?

Q10) Define the term osmotic pressure. Describe how the molecular mass of a substance can be determined on the basis of osmotic pressure measurement?

Q11) Draw a suitable diagram to express the relationship between vapour pressure and mole fractions of ideal solutions containing two components A and B at constant temperature?

Q12) A solution of 3.8g of sulphur in 100g of CS_2 (b.pt = 46.3c) boils at 46.6 ^{o}C. What is the formula of sulphur molecule in this solution? K_b for CS_2 = 2.40 k kg mol^{-1} (Ans= S_8 , atomicity = 8)

Q13) For determining molar masses of macromolecular substances in solution, the osmotic pressure measurement is preferred over measurement method from other colligative properties of solution. Give two reasons.

Q14) Give one example each of miscible liquid pairs showing +ve and –ve deviation from Roults Law. Give reason for such deviations.

Q15) what is meant by abnormal molecular mass of solute? Discuss the factors which bring abnormality in the experimentally determined molecular mass of solute using colligative properties.

Q 16) The solubility of Ba (OH) $_{2.}$ $8H_2O$ in water at 288k is 5.6g per 100g of water. What is the molality of hydroxide ions in saturated solution of Ba $(OH)_2.8H_2O$ at 288K? (Atomic mass of Ba = 137u) (Ans = 0.356m)

Q17 Differentiate between molarity and molality for a solution. How does a change in temperature influence their values?

Q18) Calculate the freezing point of an aqueous solution containing 10.50g of $MgBr_2$ in 200g of water (molar mass of $MgBr_2$ =184g, K_f for H_2O =1.86 k kg mol^{-1})

Q19) Define the terms osmotic pressure and osmosis. Is the osmotic pressure of a solution, a colligative property? Explain.

Q20) Calculate the boiling point of a solution prepared by adding 15.00g of NaCl to 250 g of H_2O (K_b =0.512 k kg mol^{-1})

Q21) 2g of benzoic acid dissolved in 25g of benzene shows a depression in freezing point equal to 1.62k. Molal depression constant for benzene in 4.9 k kg mol^{-1}. What is the % association of acid if it forms dimer in solution? (Ans: - = 99.16%)

Electrochemistry

Q1. (i) In the button cells used in watches, following reaction occurs:

$Zn + Ag_2O + H_2O \rightarrow Zn^{2+} + 2Ag + 2OH^-$

Determine E^0_{cell} and ΔG^0 for the reaction.

Given $Zn^{2+} + 2e \rightarrow Zn$ $E^0 = -0.76$ V

$Ag_2O + 2H_2O + 2e \rightarrow 2Ag + 2oH^-$ $E^0 = +0.80$ V, 1F=96500C

Q2. (i) (a) Represent the galvanic cell in which $Zn + 2Ag^+ \rightarrow Zn^{2+} + 2Ag$ takes place.

b) Which electrode is negatively charged?

(c) Write the reactions taking place at each electrode.

(ii) Calculate the no. of coloumbs required for the oxidation of 1 mole of water to oxygen as per the equation $2H_2O \rightarrow 4H^+ + O_2 + 4e$.

Q3. (i) Give reasons for the following:

a) Rusting of iron is quicker in saline water than in ordinary water.

b) Aluminium metal can not be produced by electrolysis of aqueous solution of aluminium salt.

(ii) Resistance of a conductivity cell filled with 0.1M KCl solution is 100ohm. If the resistance of same cell when filled with 0.02M KCl solution is 520 ohm, calculate the conductivity and molar conductivity of 0.02 M KCl solution. Conductivity of 0.1 M KCl Solution is 1.29 Sm^{-1}.

Q4. (i) Account for the following:

a) Alkaline medium inhibits the rusting of iron.

b) Iron does not rust even if the zinc coating is broken in a galvanized iron pipe.

(ii) $Cu^{2+} + 2e \rightarrow Cu \quad E^0 = 0.34$ V

$Ag^+ + e \rightarrow Ag \quad E^0 = 0.80$ V

a)construct a galvanic cell using the above data

b) For what concentration of Ag^+ ions will the EMF of the cell be zero at 25^0C, if the conc. Of Cu^{2+} is 0.01M?

Q5. Conductivity of 0.00241M acetic acid solution is $7.896X10^{-5}$ scm^{-1}. Calculate its molar conductivity in this solution. If Λ^0_m for acetic acid be 390.5 S cm^2 mol^{-1}, what would be its dissociation constant?

Q6. (i) The resistance of a conductivity cell containing 0.001M KCl solution at 298 K is 1500 Ω. What is the cell constant, if the conductivity of 0.0001M KCl solution at 298K is $0.146 X10^{-3}$ Scm^{-1}?

(ii) Predict the products of electrolysis in a solution of H_2SO_4 with Pt electrodes.

Q7. Express the relation among the conductivity of solution in the cell, the cell constant and the resistance of solution in the cell?

Q8. What type of a battery is lead storage battery? Write the anode and the cathode reaction and the overall reactions occurring in a lead storage battery?

Q9. Two half-reactions of electrochemical cells are given below:

$MnO_4^- + 8H^+ + 5e \rightarrow Mn^{2+} + 4H_2O \quad E^0 = +1.51$ V

$Sn^{2+}(aq) \rightarrow Sn^{4+}(aq) \quad E^0 = +0.15$ V

Construct the redox reaction from the standard potential of the cell and predict if the reaction is

reactant favoured or product favoured.

Q10. (a) At 291K, molar conductivities at infinite dilution of NH_4Cl , NaOH and NaCl are 129.8 , 217.4 , 108.9 $ohm^{-1}\ cm^2\ mol^{-1}$ respectively. If molar conductivity of centinormal solution of NH_4OH is 9.33 $ohm^{-1}\ cm^2\ mol^{-1}$, what is the degree of dissociation of NH_4OH solution?
(b) The standard potential values of three metallic cations X.Y.Z are 0.52, -3.03, -1.18 V respectively. What will be the order of reducing power of the corresponding metals?

Q11. What are fuel cells? Write the electrode reactions of a fuel cell which uses the reaction of hydrogen and oxygen.

Q12. How does molar conductivity vary with conc. in case of (I) weak electrolyte (ii) Strong electrolyte ? Give reasons for these variations.

Q13. How much copper is deposited on the cathode of an electrolytic cell if a current of 5 ampere is passed through a solution of $CuSO_4$ for 45min? (Cu= 63.5g mol^{-1})

Q14. Explain the mechanism of rusting of Iron.

BIOLOGY

1. How would the mRNA of a bacterial cell be different from that of pea plant?
2. Association of eukaryotic DNA with Histone proteins imparts stability and helps in its packaging in the nucleus. Explain.
3. Explain the working of lac operon and also why it is known as an inducible operon.
4. List the various enzymes which participate in the process of DNA replication. Also draw a labeled diagram of a replication fork.
5. What is satellite DNA and what is its utility in DNA fingerprinting?
6. How does the approach differ in EST and sequence annotation methods of genome sequencing?
7. How does sex determination in an insect, bird and human differ?
8. Is it possible to determine whether a gene is present on an autosome or a sex chromosome? How?
9. Comment upon the utility of a test cross.
10. Elucidate the structure of the DNA molecule (explain w.r.t. polarity, distance between the base pairs, width etc.)

11. Explain the following:
i) Genetic code is degenerate

ii)Genetic code is unambiguous

12. With the help of a labeled diagram explain the formation of the initiation complex in translation.
13. Distinguish between:
i)Polycistronic and monocistronic DNA

ii)Exons and introns

iii)Mendelian disorders and chromosomal disorders

iv)Euploidy and aneuploidy

v)Dominance, codominance and incomplete dominance

14. Give the cause,inheritance pattern and symptoms of the following genetic disorders:

i)Turner's syndrome

ii)Down's syndrome

iii)Phenylketonuria

15. What do you understand by the following:

Gene Allele Phenotype Genotype Cistron

Heterozygous Homozygous Monohybrid cross

Dihybrid cross Linkage Recombination

16. Give reasons as to why RNA was known to be the first genetic material and also cite reasons for its place later being given to DNA.

17. Comment upon the specifications of the Pea plant which favored its choice by Mendel.

18. What is the inheritance pattern observed in the size of starch grains and seed shape of Pisum sativum.How does this pattern deviate from Mendel's first law?

19. State the aim and describe Messelson and Stahl's experiment

20. Compare and contrast the behaviour of genes and chromosomes.

21. Mention the categories under which cucurbits and papaya plants are put on the basis of the kinds of flowers they bear.

22. Why is a whiptail lizard reffered to as parthenogenetic?

23. Draw a labeled diagram of a pollen grain.Mention the location and significance of sporopollenin.

24. Draw a labeled diagram of T.S. of a young anther.Mention the location and function of the tapetum?

25. Name the following structures /processes:

i)Single cotyledon of monocots

ii)Occurrence of more than one embryo in a seed

iii)Seedless fruits produced without fertilization

iv)Removal of anthers from a bisexual flower

26. Why are pollen grains produced in enormous quantity in maize/wheat?

27. Each pollen grain contains two male gametes, then why can't two pollen grains fertilise four ovules?

28. Outline the process of microsporogenesis.

29. Outline the process of megasporogenesis.

30. Mention the pollinating agents of small ,dull colored flowers with exposed and feathery stigma.Give any two characteristics of pollen produced by such flowers.

31.Distinguish between the flowers of brinjal and beans on the basis of the kind of pollination that occurs in them.

32. Explain the three kinds of endosperm development in angiosperms.

33. With the help of diagrams explain the development of a dicotyledenous embryo.

34. Draw labeled diagrams of structures of mature dicot and monocot embryo's.

35. Can microspores and pollen be used as synonyms?Why/why not?

36.Why are offsprings of oviparous animals at a greater risk as compared to those of viviparous animals?

37. What are the different ways through which self incompatibility is achieved in angiosperms?

38. Explain the occurrence of polyembryony in citrus fruits.

39.Distinguish between :

i)Unisexual and bisexual

ii)Monoeciuos and dioecious

iii)Homothallic and heterothallic.

40.Draw and explain the structure of a bisexual flower.

II. Search for an appropriate topic for your project. Collect relevant information and

Mail it to ayushmaan425@gmail.com.

III.Complete your practicle file work.

ECONOMICS

Chapter 1- Introduction

1. What is meant by economizing of resources?
2. Explain the problem of how to produce with the help of an example.
3. Why does the problem of choice arise?
4. Why is PPC concave to its origin? Explain.
5. Does production take place only on the PPC?
6. Which of the following statements are true or false? Give reasons.

A) An economy always produces on but not inside the PPC.

B) Massive unemployment shift the PPC to the left.

C) An economy cannot operate on any point outside the PPC.

7. A lot of people and many factories are destroyed because of a severe earthquake in a country. How will it affect country's PPC?
8. Draw a PPC when MRT is constant. Give reasons.
9. Explain how scarcity and choice go together.
10. Explain the concept of opportunity cost with the help of example.

Chapter 4 Theory of demand

11. Explain the determinants of demand.
12. Distinguish between expansion of demand and increase in demand.
13. When is good is called inferior good?
14. Explain the effect of increase in income of the consumer on the demand for a good.
15. Explain how demand for a good affected by prices of its related good? Give examples.
16. Distinguish between change in quantity demanded and change in demand.
17. How will an increase in the price of tea affect the demand for sugar? Explain with diagram.
18. Why is demand for water inelastic?

Chapter 5 Elasticity of demand

19. What is meant by price elasticity of demand? Explain any three factors affecting it.

20. How does the nature of a good affect price elasticity of demand? Explain

21. Demand of a product is elastic. Its price falls, what will be its effect on total expenditure? Give a numerical example.

22. Explain the following:

A. Complementary goods often exhibit low elasticity of demand.

B. Luxuries of life often exhibit low elasticity of demand.

C. Higher the price level, higher should be the elasticity of demand.

D. In case of normal goods, income effect is positive, while in case of inferior goods, it is negative.

23. Explain geometric method of price elasticity of demand.

24. What is the relationship between elasticity of demand and change in expenditure on a good?

Chapter 6 Production function

25. Explain the relationship between TPP and MPP with the help of diagram.

26. Explain the law of variable proportion. Use diagram

27. What is meant by returns to a factor? What leads to increase returns to a factor? Explain

28. Write your comment on each of the following statements in a sentence or two:

A. MP must cut AP from its top.

B. If AP is falling, AP > MP.

C. If AP is rising, AP < MP.

D. If AP is rising, MP must also rise.

E. TP must rise as more and more units of a variable factor are combined with the fixed factor.

F. MP is the rate of TP.

G. When MP is decreasing, TP increases at a constant rate.

H. When MP is increasing, TP increases at a decreasing rate

I. When MP is constant, TP is also constant.

J. Increasing returns to a factor occur because the variable factor is abundantly used in production.

Chapter 7 Concept of cost

29. State the distinction between explicit cost and implicit cost. Give an example of each.

30. What is the relationship between marginal cost and average variable cost.

31. Draw ATC, AVC and MC curves in a single diagram. Also explain the relationship between ATC and AVC.

32. Why does the difference between ATC and AVC decrease with the increase in output? Can these two be equal at some level of output?

33. Define the following terms: - Money Cost, Real Cost, Private Cost and Social Cost.

34. A firm is producing 20 units. At this level of output, ATC and AVC are respectively equal to Rs 40 and Rs 37. Find out the TFC of the firm.

35. Output increases from 3 units to 4 units. As a result, TC rises from Rs 19.60 to Rs.24.50. Find out MC.

36. Why does the minimum point of AC curve fall towards right of AVC curve?

37. "MC can be calculated both from TC and TVC and is not affected by TFC".Discuss.

38. Why does the SMC curve cut the AVC curve at the minimum point of the AVC curve?

39. Why is the short run MC curve U-shaped?

40. Explain the relationship between TC, TVC and TFC with the help of hypothetical schedule and diagram.

41. What changes will take place in MR when,(1) TR increases at an increasing rate; (2) TR increases at an diminishing rate; (3) TR increases at a constant rate.

42. What changes should take place in total revenue so that ;(1) MR is positive and constant; and (2) MR is positive and falling.

43. In a firm, AR=MR=Rs 5 at each level of output. What does it tell about ; (1) nature of demand curve; (2) rate of increase in TR; and (3)shape of TR curve?

44. Why AR curve under monopolistic competition is more elastic than AR curve under monopoly?

45. If MR curve is parallel of the x-axis, what does it tell about price and the demand?

46. Discuss the relationship between AR and MR when: (1) Price remains constant. (2) Price falls with rise in output.

47. A shopkeeper sold Rs 25 calculators at the price of Rs. 125 each. His total receipts increased to Rs. 3255 after selling 26 calculators. At what price did he sell the 26^{th} calculator?

48. When sale of a unit increased from 20 units to 35 units, the total revenue increased by Rs. 1200. Calculate marginal revenue.

49. What would be the shape of the demand curve (AR curve) so that TR is (1) positively sloped straight line passing through the origin, (2) a horizontal line?

50. Why is the total revenue curve of a price- taking firm an upward sloping straight line? Why does the curve pass through the origin?

51. Explain the meaning and conditions of producer's equilibrium.

52. In case of imperfect competition determine producer's equilibrium using MR-MC approach.

53. Is it correct to say that profit of a producer under perfect competition is maximum at a level at which P=MC but MC is decreasing?

54. Can there be a positive level of output that a profit maximizing firm produces in a competitive market at which market price is not equal to MC? Give an explanation.

55. Determine producer's equilibrium from the following data through the MR-MC approach. Give reasons for your answer.

Output(units)	1	2	3	4	5
AR(Rs)	12	11	10	9	8

AC(Rs) 4 5 6 7 9

56. Why should MC curve cut MR curve from below to achieve produce's equilibrium?

57. If MC is more than MR at a particular level of output, then how will a producer's react to maximize the profits?

58. Define supply. Distinguish between supply and stock.

59. Define market supply of a good. Give three causes of a rightward shift of supply curve.

Distinguish between change in supply and change in quantity supplied of a commodity.(use diagrams)

COMPUTER SCIENCE

Q1.Find the output of the following program:

```
#include<string.h>
#include<iostream.h>
#include<ctype.h>
void change(char msg[ ], int len)
{
for( int count=0;count< len;count++)
 {
    if(islower(msg[ count]))
        msg[count]=toupper(msg[count]);
else if(isupper(msg[ count]))
        msg[count]=tolower(msg[count]);
else if(isdigit(msg[ count]))
      msg[count]=msg[count]+1;
 else

     msg[count]= '*';

     }
}
void main( )
{
   char message[ ]= " 15th  AugusT CelebratED";
```

```
int size= strlen( message);
change(message,size);
cout<<message<<endl;
for( int c=0;,r=size-1;c<=size/2; c++,r--)
     {
          char temp=message[c];
          message[c]=message[r];
          message[r]=temp;
        }
cout<<message<<endl;
 }
```

Q2.What is the difference between call by value and call by reference? Explain with example?

Q3. In the following C++ program what is expected value of myscore from options (i) to (iv) given below.

```
#include<stdlib.h>
#include<iostream.h>


     void main(  )
     {
     randomize( );
     int score[]={ 25, 20,34,56, 72, 63};
     int myscore=score[2+random(2)];
     cout<<myscore<<endl;
     }
```

i) 25 ii) 34 iii) 20 iv) None of these

Q4. Find the output of the following program, show Dry Run also:

```
#include <iostream.h>

void Changethecontent(int Arr[], int Count)

{

     for (int C=1;C<Count;C++)
```

```
            Arr[C-1]+=Arr[C];
    }
    void main()
    {
        int A[]={3,4,5},B[]={10,20,30,40},C[]={900,1200};
        Changethecontent(A,3);
        Changethecontent(B,4);
        Changethecontent(C,2);
        for (int L=0;L<3;L++)
            {cout<<A[L]<<'#';}
        cout<<endl;
        for (L=0;L<4;L++)
            {cout<<B[L] <<'#';}
        cout<<endl;
        for (L=0;L<2;L++)
            {cout<<C[L] <<'#';}
    }
```

Q5. Find the output of the following program, show Dry Run also:

```
    #include <iostream.h>
    struct PLAY
    { int Score, Bonus;};
    void Calculate(PLAY &P, int N=10)
    {
```

```
        P.Score++;P.Bonus+=N;
    }
    void main()
    {
        PLAY PL={10,15};
        Calculate(PL,5);
        cout<<PL.Score<<":"<<PL.Bonus<<endl;
        Calculate(PL);
        cout<<PL.Score<<":"<<PL.Bonus<<endl;
        Calculate(PL,15);
        cout<<PL.Score<<":"<<PL.Bonus<<endl;
    }
```

Q6. Find the output of the following program: 3

```
    #include <iostream.h>
    void Secret(char Str[ ])
    {
    for (int L=0;Str[L]!='\0';L++);
    for (int C=0;C<L/2;C++)
    if (Str[C]=='A' || Str[C]=='E')
    Str[C]='#';
    else
    {
    char Temp=Str[C];
```

```
        Str[C]=Str[L-C-1];
        Str[L-C-1]=Temp;
        }
        }
        void main()
        {
        char Message[ ]="AnTARctica";
        Secret(Message);
        cout<<Message<<endl;
        }
```

Q7. In the following program, if the value of Num entered by the user is 65, what will be the expected output(s) from the following options (i), (ii), (iii) and (iv)?

```
#include <iostream.h>
#include <stdlib.h>
void main()
{
int Num, New;
randomize();
cin>>Num;
for (int I=1;I<=4;I++)
{
New=Num+random(I);
cout<<(char)New<<"::";
} }
```

(i) A::B::B::C::

(ii) A::C::B::A::

(iii) B::C::D::A::

(iv) C::A::B::D::

Q8. Define degree and cardinality of a table? Explain with the help of an example.

Q9. Consider the following tables Employee and salary. Write SQL commands for the statements (i) to (v) and give outputs for SQL queries:

Table : Employee

Eid	Name	Deptid	Qualification
1	Deepali Gupta	101	MCA
2	Rajat Tyagi	101	BCA
3	Hari Mohan	102	B.A
4	Harry	102	M.A
5	Sumit Mittal	103	B.Tech
6	Jyoti	101	M.Tech

Table : Salary

Eid	Basic	DA	HRA	Bonus
1	6000	2000	2300	200
2	2000	300	300	30
3	1000	300	300	40
4	1500	390	490	30
5	8000	900	900	80
6	1000	300	490	89

(i) To display the number of employees department wise.

(ii) To list the names of those employees only whose name starts with'H'

(iii) To add a new column in salary table . The column name is total_sal.

(iv) To store the corresponding values in the employee table.

7, 'Manish', 103, 'LLB'

(v) To display name, qualification, basic and DA of all employees.

(vi) Select name from employee where eid in(3,5,6);

(vii) select Distinct deptid from Employee;

Q10. Write the SQL queries asked below referring the following tables:

TABLE: GUIDE

SUBJECT	ADVISOR
PHYSICS	VINOD
COMP SC	ALOK
CHEMISTRY	RAJAN
MATHS	MANJU
HISTORY	SMITA

TABLE: STUDENT

ID	NAME	STIPEND	SUBJECT	AVERAGE	DIV
1	KARAN	400	PHYSICS	68	1
2	DIVAKAR	450	COMP SC	68	1
3	DIVYA	300	CHEMISTRY	62	2
4	ARUN	350	PHYSICS	63	1
5	SABINA	500	MATHS	70	1

6	JOHN	400	CHEMISTRY	55	2
7	ROBERT	250	PHYSICS	64	1
8	UBINA	450	MATHS	68	1
9	VIKAS	500	COMP SC	62	1
10	MOHAN	300	MATHS	57	2

(i) To count the number of students in each subject with an average stipend more than 350.
(ii) To display the name and stipend of all students.
(iii) To display the name, subject and average of every student whose average is less than 500.
(iv) To display record of all the students whose subjects are Physics, Chemistry and Maths.
(v) To display the name, subject and advisor for all students.
(vi) To display name, subject, advisor of those students whose division is 1.

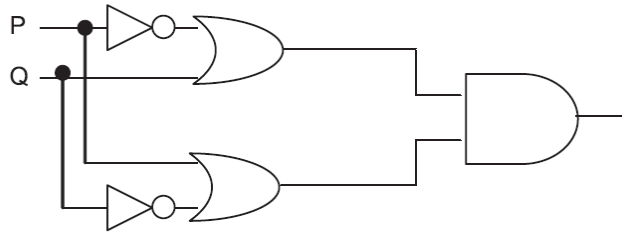
Q11. Consider the following table STUDENT. Write SQL commands for the statements

(i)to(v) STUDENT

RNO	STUDENTNAME	STREAM	ACTIVITY	PERCENTAGE
1001	JYOTI	SCIENCE	CRAFT	79
1002	RAMAN	COMMERCE	SPORTS	80
1003	ROHAN	SCIENCE	MUSIC	85
1004	DIVYA	HUMANITIES	MUSIC	90

(1) Display the student name and stream of all students having activity music.
(2) Display highest and lowest percentage.
(3) Display the record of all students whose names start with a letter 'R'.
(4) Display number of students in each stream.
(5) Display the record of all students in ascending order of student name.

Q12. Write the equivalent Boolean Expression F for the following circuit diagram :



Q13. Reduce the following Boolean expression using K-Map:

F(A,B,C,D)=∑(0,1,2,4,5,8,9,10,11)

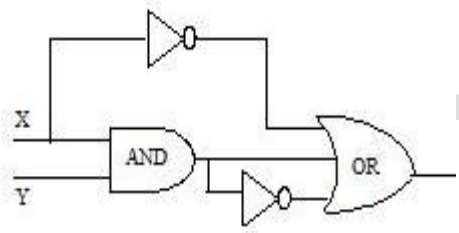
Q14. Obtain a simplified form for a boolean expression

F(U,V,W,Z)= ∑□ (0,1,3,5,6,7,10,14,15)

Q15. Reduce the following boolean expression using K-Map

F(A,B,C,D) = π□ (5,6,7,8,9,12,13,14,15)

Q16. Write the equivalent Boolean Expression for the following Logic Circuit.



Q17.Reduce the following Boolean expression using K-Map :

F(P, Q, R, S) = π□(0, 3, 5, 6, 7, 11, 12, 13, 14,15)

Q18. Prove Associative Laws and Demorgan's second Law.

Q19. Convert the following Boolean expression into its equivalent Canonical Product of Sum form (POS):

A.B'.C + A'.B.C +A'.B.C'

Q20. Reduce the following Boolean expression using K-Map :

F(P, Q, R, S) =π□(1,2, 3, 5, 6, 7,8,9, 11, 12)