16.What is the relationship between e-business and e-Commerce?

17.How does e- business help in minimizing operating cost of business?

18.For which type of goods C2C commerce is best suited?

19.How does discounting of bills help businessman?

20.Define minimum subscription.

21.What steps can be taken by business to minimise risk?

22.Distinguish between wholesale and retail trade.

23.Distinguish between partnership and sole proprietorship.

24.What is prospectus ? Explain any two points of importance of prospectus.

25.What are the different kinds of organisations that come under the public sector?

26.Distinguish between goods and services.

27.Give the benefits of life insurance policy.

28.E-Banking provides various benefits to customers. State any three such benefits.

29.How is the intra- B commerce helpful for a firm?

30.Explain customer to customer mood of e-business.

31.Explain the need for outsourcing.

32.State the process of online transactions

33.Explain the functions of commercial banks in India.

34. Differentiate between life insurance and general insurance (at least 6).

35.State three merits and three demerits of government companies.

36.Distinguish between a joint Hindu family business and partnership.

37."Registration of a partnership is not mandatory but is very beneficial." How?

38.Differentiate industry trade and commerce on any five basis.

39.Give six steps necessary to start trading.

40.Why does business need multiple objectives? Explain any five such objectives.

Model paper 11 ECONOMICS

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1 Explain any three functions of statistics.
Or **3**
Explain the role of statistics in economic planning.

ANS: Following are the functions of statistics :
(*i*) Statistics presents complex facts into simple and definite form.
(*ii*) Statistics helps in condensing vast statistical information into a few significant figures.
(*iii*) Statistics facilitates comparisons among similar data.

2 What are the main features of statistics as a numerical data ? Describe any three.
Or 3
Define statistics in plural sense. Give its any two characteristics.

ANS: In the plural sense, statistics means numerical facts systematically collected relating to any field of enquiry. In other words, statistics in its plural sense refers to 'data'. Main features of statistics as a numerical data are :

(*i*) Statistical data is aggregate of facts : A single number does not constitute statistics. Only when numbers are placed in relation to each other and conclusions can be drawn from it then they constitute statistical data.
(*ii*) Statistical data is numerically expressed : Statistics are expressed only in quantitative figures. Qualitative aspects of a problem do not constitute statistics.
(*iii*) Statistical data has reasonable standards of accuracy : Statistics are reasonably accurate though it has limitations. The accuracy of the statistical data depends upon the purpose of investigation, nature, size of sample and method of collecting data.
(*iv*) Statistical data is placed in relation to each other : Statistical data should be comparable. Data should be placed in such a way that these can be compared. Comparisons are possible only if the data are homogeneous. (Any three)

3 Conventional divisions of the study of economics comprises study of consumption, production and distribution. Explain. 3

ANS: Economics involves the study of men engaged in economic activities of all kinds which are production, consumption and distribution.
(*i*) Production : Manufacturing of goods by producers for the market (or for profit motive) is called production.
(*ii*) Consumption : Purchase of goods by consumers to satisfy their various needs is called consumption.
(*iii*) Distribution : Division of national income into wages, profit, rent and interest is called distribution.

4 What are the reasons for studying economics ?

Or 4

What is the importance of statistics in economics ?

ANS: Statistics is immensely useful in the study of economics. Following are some points of importance of statistics :
(*i*) Statistics help an economist to understand an economic problem. Using various statistical methods, effort is made to find the causes behind it with the help of the qualitative and quantitative facts. Once the causes of the problem are identified, it is easier to formulate certain policies to tackle it.
(*ii*) Statistics enables an economist to present economic facts in precise and definite forms. When economic facts are expressed in statistical terms, they become exact facts which are more convincing than vague statements.
(*iii*) Statistics is used in finding relationship between different economic variables. We can find the relationship between demand and price, consumption expenditure and income, general price level and government expenditure by applying the statistical tool of correlation.
(*iv*) Statistics helps an economist in predicting changes in one economic factor due to changes in another factor. This can be done with the help of regression technique.

5 Distinguish between quantitative data and qualitative data. Give two examples of each. 4

ANS: Statistical data are of two types :
Quantitative data refers to the data which can be measured in numerical terms, e.g., daily temperature, heights and weights of individuals, prices of goods, income of individuals are quantitative data.
Qualitative data are the data or facts which cannot be measured directly in numerical terms, e.g., beauty, intelligence, ability to sing, learning skills are qualitative data.

6 What do you mean by arithmetic line graph ? Explain briefly.

ANS: Arithmetic line graphs are graphs of time series data. In it, time period is shown on the *x*-axis and
the corresponding values of the variable are shown on the *y*-axis. Arithmetic line graphs, also called
time series graphs are of two types :
(*i*) Graphs of one variable
(*ii*) Graphs of two or more variables

7. Prepare a suitable table from the following information :
In Bombay, 80% of the total population were tea drinkers. Out of which 62% are males and 18% are
females. Rest are non-tea drinkers, out of which 12% are females. Give suitable title. 3

ANS: Tea Drinking Habits in Bombay

Total Population			
Tea Drinkers		Non-Tea Drinkers	
Male	Female	Male	Female
62 %	18 %	8 %	12 %

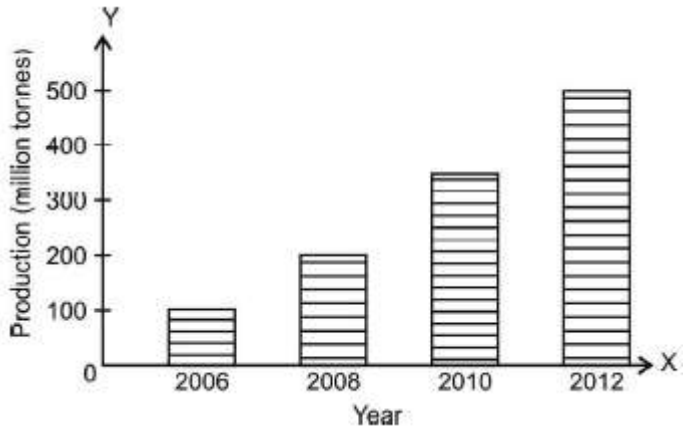
8. Present the data in the form of a simple bar diagram :

Year	2006	2008	2010	2012
Production of wheat (million tonnes)	100	210	350	500

3

ANS: Simple Bar Diagram

Wheat production of Different years

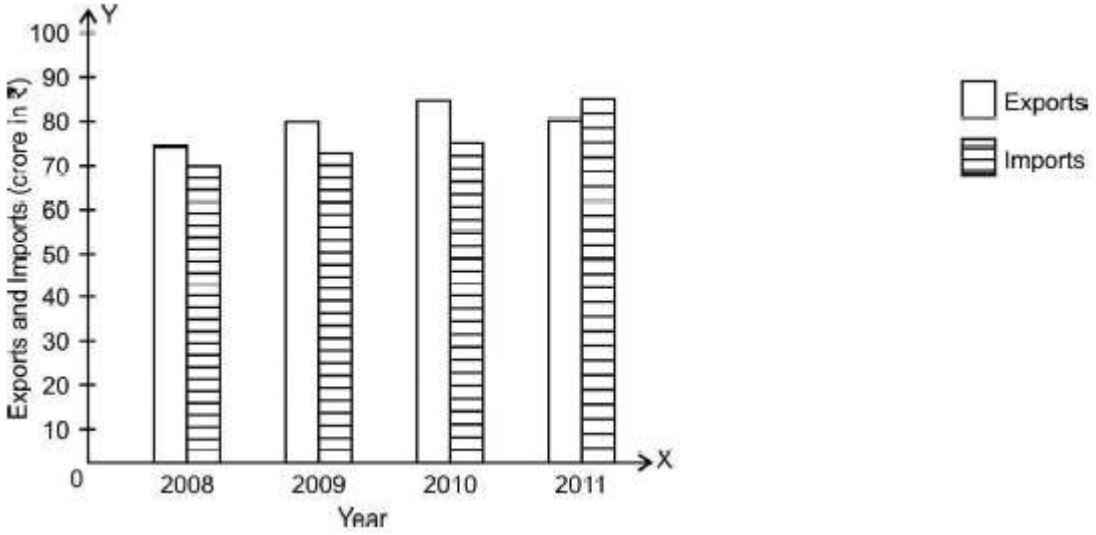


9. Represent the following data with the help of multiple bar diagram :

Year	2008	2009	2010	2011
Exports (crores in)	73	80	85	80
Imports (crores in)	70	72	75	85

3

ANS: Multiple Bar Diagram

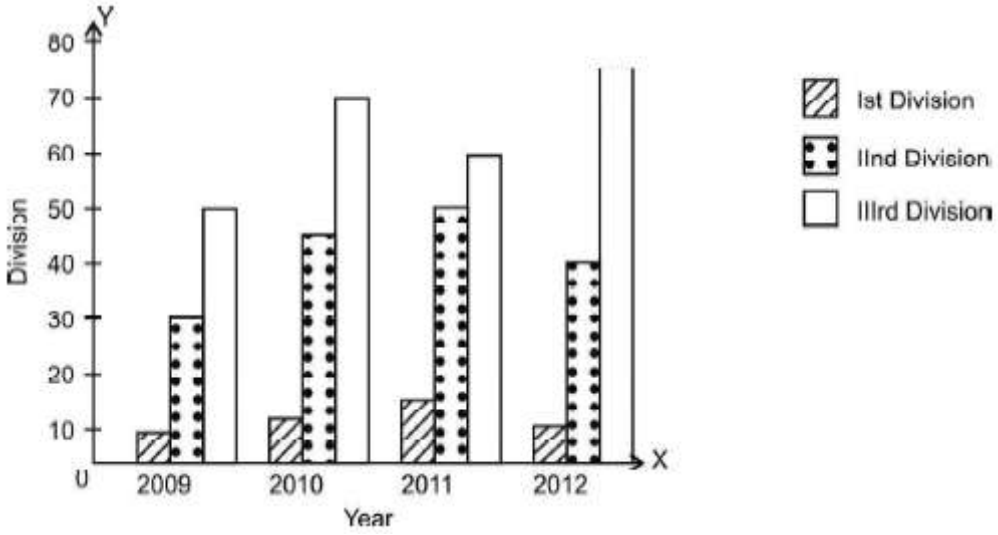


10 Draw multiple bar diagram.
The result of X class students is given as follows :

Year	Ist Division	IInd Division	IIIrd Division
2009	10	30	50
2010	12	45	70
2011	14	50	60
2012	11	40	75

3

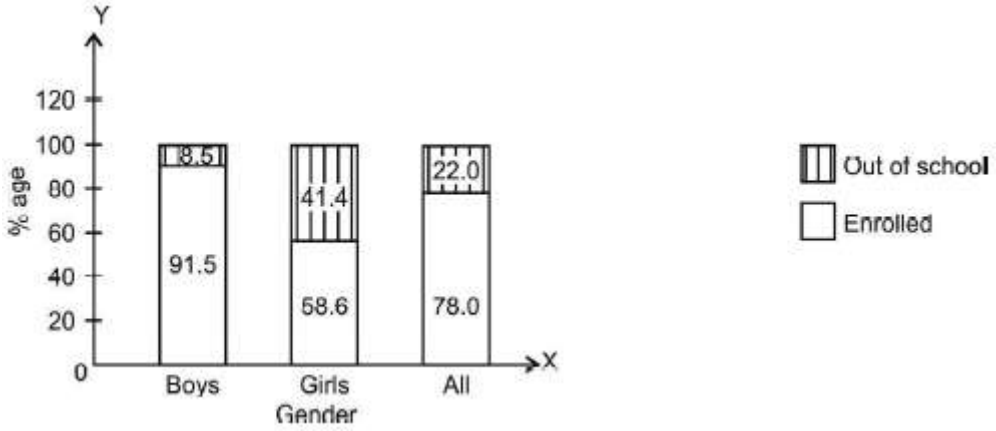
ANS: Multiple Bar Diagram



11. Present the data given by means of a percentage bar diagram : 3

Gender	Enrolled (%)	Out of school (%)
Boys	91.5	8.5
Girls	58.6	41.4
All	78.0	22.0

ANS: Percentage Bar Diagram



12. A good measure of average should be
(*i*) affected by extreme values
(*ii*) affected by sampling fluctuations
(*iii*) based on all values
(*iv*) incapable of further algebric treatment 1

ANS: (*iii*) based on all values

13. Median of discrete series is given by

(*i*) $\left[\frac{(n+1)}{2}\right]^{th}$ value (*ii*) $\left[\frac{n}{2}\right]^{th}$ value

(*iii*) $\left[\frac{(n+1)}{4}\right]^{th}$ value (*iv*) $\left[\frac{n}{4}\right]^{th}$ value 1

ANS: (*i*) $\left[\frac{(n+1)}{2}\right]^{th}$ value

14

Variable	97	95	90	80
Frequency	60	30	12	4

In the given table, the data is defined as 1
(*i*) unimodal
(*ii*) bimodal
(*iii*) multi-modal
(*iv*) none of the above

ANS: (*i*) unimodal

14 Define median. 1

ANS: Median is the middle value of the series when the data is arranged in ascending or descending order.

15 Which average would be suitable in the following cases ?
(*i*) Average size of readymade garments.
(*ii*) Average intelligence of students in a class.
(*iii*) Average production in a factory per shift. 3
(*iv*) Average wages in an industrial concern.
(*v*) When the sum of absolute deviations from average is least.
(*vi*) In case of open-ended frequency distribution.

ANS: (*i*) Mode (*ii*) Median (*iii*) Mean (*iv*) Mean (*v*) Median (*vi*) Median or Mode.

16 If the arithmetic mean of a series is 28, what will be the resultant mean if each item of the series 3
is increased by 3, decreased by 5, divided by 4 or multiplied by 10.

ANS: (*i*) When each item is increased by 3, the new mean $\bar{x}$ = 28 + 3 = 31
(*ii*) When each item is decreased by 5, the new mean $\bar{x}$ = 28 – 5 = 23
(*iii*) When each item is divided by 4, the new mean $\bar{X} = \frac{28}{4} = 7$
(*iv*) When each item is multiplied by 10, the new mean $\bar{x}$ = 28 × 10 = 280

17 Calculate arithmetic mean from the following data :

X	f
Less than 10	5
Less than 20	15

4

Less than 30	55
Less than 40	75
Less than 50	100

ANS: Since cumulative frequencies are given, first we find simple frequencies.

Marks	f	M.V.	d	d′ = d/10	fd′
0 – 10	5	5	–20	–2	–10
10 – 20	10	15	–10	–1	–10
20 – 30	40	(25) A	0	0	0
30 – 40	20	35	10	+1	20
40 – 50	25	45	+20	+2	50
	Σf *or* N = 100				Σfd′ = 50

$$\overline{X} = A + \frac{\Sigma fd'}{N} \times i$$

$$\overline{X} = 25 + \frac{50}{100} \times 10 = 25 + \frac{500}{100}$$

$$= 30$$

18 Find the median of the following : 4

Class Interval	0 – 10	10 – 30	30 – 60	60 – 80	80 – 90
Frequency	5	15	25	8	3

C.I.	f	c.f.
0 – 10	5	5
10 – 30	15	20
30 – 60	25	45
60 – 80	8	53
80 – 90	3	56

$$\frac{N}{2} = \frac{56}{2} = 28$$

$$\text{Median} = l_1 + \frac{\frac{N}{2} - \text{c.f.}}{f} \times i$$

$$= 30 + \frac{28 - 20}{25} \times 30$$

$$= 30 + \frac{8}{25} \times 30$$

$$= 30 + \frac{240}{25} = 39.6$$

ANS:

19 The data collected by the investigator himself is called

(*i*) primary data

(*ii*) secondary data 1

(*iii*) both primary and secondary data

(*iv*) none

20 The method of collecting primary data is

(*i*) personal interview

(*ii*) telephone interview 1

(*iii*) mailing questionnaire

(*iv*) all

21 The greatest demerit of mailing questionnaire is that the respondents

(*i*) do not return it

(*ii*) do not answer the question 1

(*iii*) do not go through it carefully

(*iv*) all

22 Telephone survey is the most suitable method of collecting data when the population is

(*i*) literate and having telephone

(*ii*) spread over remote areas 1

(*iii*) both (*i*) and (*ii*)

(*iv*) lives in city

23 Which of the following statements is correct ?
(*i*) There is a certain bias involved in the non-random selection of samples.
(*ii*) Non-sampling errors can be minimised taking a larger sample.
(*iii*) Data obtained by conducting a survey is called secondary data.
(*iv*) Mailing questionnaire method can be adopted even if the respondents are illiterate.

24 .Production Possibility Curve would be..... curve if all the available resources in an economy are equally efficient to produce both the goods.(Choose the correct alternative)
a) a straight line b) convex to origin
c) concave to origin d) upward sloping

25 Classification of population of India in terms of years is an example of
(*i*) Geographical classification
(*ii*) Chronological classification 1
(*iii*) Quantitative classification
(*iv*) Qualitative classification

ANS: (*ii*) Chronological classification

26 A frequency distribution table showing value of sales in different columns and advertisement expenditure in different rows is termed as 1
(*i*) Bilateral frequency distribution
(*ii*) Univariate frequency distribution 1
(*iii*) Multivariate frequency distribution
(*iv*) None of the above

ANS: (*i*) Bilateral frequency distribution

27 In case of inclusive method,
(*i*) upper limit of class interval is excluded
(*ii*) lower limit of class interval is excluded 1
(*iii*) both upper limit and lower limit are included
(*iv*) both upper limit and lower limit are excluded

ANS: (*iii*) both upper limit and lower limit are included

28 Two important functions of classification are
(*i*) scrutiny and editing of data
(*ii*) presentation and interpretation of data 1
(*iii*) reducing bulk data and facilitating comparision
(*iv*) forming trend and tendencies

ANS: (*iii*) reducing bulk data and facilitating comparision

29 Range is the
(*i*) difference between the largest and the smallest observations.
(*ii*) difference between the smallest and the largest observations. 1
(*iii*) average of the largest and the smallest observations.
(*iv*) ratio of the largest to the smallest observations.

ANS: (*i*) difference between the largest and the smallest observations.

30 In a frequency distribution, the class may be
(*i*) singular or plural
(*ii*) subjective or objective 1
(*iii*) individual or discrete
(*iv*) inclusive or exclusive

ANS: (*iv*) inclusive or exclusive

31 The class mid-point is equal to
(*i*) The average of the upper class limit and the lower class limit.
(*ii*) The product of upper class limit and the lower class limit. 1
(*iii*) The ratio of the upper class limit and the lower class limit.
(*iv*) None

ANS: (*i*) The average of the upper class limit and the lower class limit.

32 The frequency distribution of two variables is known as
(*i*) Univariate Distribution
(*ii*) Bivariate Distribution 1
(*iii*) Multivariate Distribution
(*iv*) None

ANS: (*ii*) Bivariate Distribution

33 Statistical calculations in classified data are based on
(*i*) the actual values of observations
(*ii*) the upper class limits 1
(*iii*) the lower class limits
(*iv*) the class mid-points

ANS: (*iv*) the class mid-points

34 Under Exclusive method,
(*i*) the upper class limit of a class is excluded in the class interval.
(*ii*) the upper class limit of a class is included in the class interval. 1
(*iii*) the lower class limit of a class is excluded in the class interval.
(*iv*) the lower class limit of a class is included in the class interval.

ANS: (*i*) the upper class limit of a class is excluded in the class interval.

35 Give an example of ‘attribute’ ? 1

ANS: The data classified on the basis of some quality such as marital status, literacy, religion etc.

36 What do you mean by ‘frequency’ in statistics ? 1

ANS: Number of times the observation occurs in the given series is called frequency.

37 What is raw data ? 1

ANS: The data collected by the investigator in its original form is called raw data.

38 Define ‘Class-Interval.’ 1

ANS: When the whole range of values of the variable are classified in some group in the form of intervals, it is known as class interval.

39 Categorise and explain the following variables as discrete variables and continuous variables : 3
(*i*) Height of a student (*ii*) Distance covered (*iii*) Number of Students in a class.

ANS: (*i*) Height of a student is a continuous variable. It is so because
(*a*) it can take values that are whole numbers like 95 cm, 102 cm etc.
(*b*) it can take fractional values like 80.85 cm, 101.62 cm etc.
(*ii*) Distance covered is a continuous variable. It is so because
(*a*) it can take values like 400 m, 484 m etc.
(*b*) it can take fractional values like 48.4 km, 59.2 km etc.
(*iii*) Number of students in a class is a discrete variable because it can take value of whole numbers only.
It cannot take fractional values, e.g., number of students can be 40 or 41 but not 40.5 or 40.6.

40 Do you think that classified data is better than raw data ? 3

ANS: The data collected by the investigator in its original form is called raw data. This data is an unorganised data. It is extremely difficult to draw any conclusion from this data. It is, therefore, necessary to arrange the data in some orderly manner. Further processing of data into different groups or classes according to their characteristics is known as classification of data. This facilitates comparison. The data is condensed in such a way that their similarities and dissimilarities become very clear. Thus, we can say that classified data is better than raw data.

41 Distinguish between univariate and bivariate frequency distribution. 3

ANS: On the basis of the variables to be studied, frequency distribution can be classified into :
(*i*) Univariate and (*ii*) Bivariate.
(*i*) Univariate Frequency Distribution : The frequency distribution of a single variable is called a univariate distribution *e.g.*, marks obtained by students in a subject.
(*ii*) Bivariate Frequency Distribution : The frequency distribution of two variables is called bivariate distribution e.g., height and weight of students.

42 What is frequency distribution ? How does it differ from frequency array? 4

ANS: When observed data are grouped according to class intervals and frequencies of various classes are shown against them, then this presentation of data is called frequency distribution.

Main differences are :

Frequency Distribution	Frequency Array
(*i*) It shows how the different values of a variable are distributed in different classes alongwith their corresponding class frequencies. (*ii*) It is a technique of classifying data for a continuous variable.	(*i*) It shows different values of the variables aongwith their corresponding frequencies. (*ii*) It is technique of classifying the data for a discrete variable.

43. Differentiate between chronological and spatial classification. Construct an imaginary table based on spatial classification. 4

ANS: When the data is classified on the basis of time, then it is known as chronological classification. For example, we may present population on the basis of number of years.

When the data is classified on the basis of place such as country, state, area etc., it is called spatial classification.

For example, production of wheat in different States of India.

State	Yield of wheat in Million Tonnes
Punjab	34
Uttar Pradesh	42
Maharashtra	18

SATISH CHANDRA MEMORIAL SCHOOL

MODEL QUESTION PAPER

CLASS-XI

GEOGRAPHY

1. What are the different types of rocks? Write their characteristics.

Ans: There are main three types of rocks. These are--

IGNEOUS ROCKS: Igneous rock is formed when magma cools and solidifies; it may do this above or below the Earth's surface. Magma can be forced into rocks, blown out in volcanic explosions or forced to the surface as lava. The atoms and molecules of melted minerals are what make up magma.

- They are primary rocks.
- formed due to cooling of lava
- They are two types- intrusive & extrusive rocks. Extrusive rocks have small grains because of sudden cooling intrusive rocks have bigger grains due to slow cooling.
- No layers
- Do not contain fossils.
- They are hard.
- Do not allow water to percolate through them.
- SEDIMENTARY ROCKS: The word 'sedimentary' is derived from the Latin word sedimentum, which means settling. Rocks (igneous, sedimentary and metamorphic) of the earth's surface are exposed to denudational agents, and are broken up into various sizes of fragments. In many sedimentary rocks, the layers of deposits retain their characteristics.
- Formed Due To Sedimentation
- Consists Of Layers
- Contain Fossils
- The Process Of Sedimentary Rock Formation Is Called Lithification
- They Are Three Types.
    a. Mechanically Formed
    b. Chemically Formed
    c. Organically Formed.

METAMORPHIC ROCKS: A metamorphic rock is a result of a transformation of a pre-existing rock. The original rock is subjected to very high heat and pressure, which cause obvious physical and/or chemical changes. Examples of these rock types include marble, slate, gneiss, schist.

- Formed Due To Re-crystallization.
- Formed Due To Pressure And Temperature.
- Very Smooth.
- Consists of layers sometimes very precious stones.

2. **Why is the Earth uneven?**

Ans. The earth's crust is dynamic. It moved and moves vertically and horizontally. The differences in the internal forces operating from within the earth which built up the crust have been responsible for the variations in the outer surface of the crust. The earth's surface is being continuously subjected to external forces induced basically by energy. The earth's surface is being continuously subjected to by external forces originating within the earth's atmosphere and by internal forces from within the earth.

3. What is mass movement? What are the causes of it?

Ans. Mass movement: These movements transfer the mass of rock debris down the slopes under the direct influence of gravity. Air water ice does not carry debris, but debris carries them. The movements of mass may range from slow to rapid.

Activating causes precede mass movements:

i. Removal of support from below to materials above through natural or artificial means.
ii. Increase in gradient and height of slopes.
iii. Overloading through addition of materials naturally or by artificial filling.
iv. Overloading due to heavy rainfall saturation and lubrication of slope materials.
v. Removal of material or load from over the original slope surfaces.
vi. Occurrence of earthquakes, explosions etc.
vii. Excessive natural seepage.
viii. Heavy draw down of water from lakes, reservoirs and rivers.
ix. Indiscriminate removal of natural vegetation.

4. **Difference between orogeny and eperogeny.**

Ans. *Orogenic* movements are Mountain building movements whereas *Epeirogenic* movements are Continent building movements.

In *Orogenic* movements crust moves in tangential direction causing folding or faulting and *Orogenic* process crust is severely deformed, whereas in *Epeirogenic* process there may be a simple deformation.

5. "Soil is a dynamic material"- give reason.

Ans: Soil is the collection of natural bodies on the earth's surface containing living matter and supporting or capable of supporting plants.
Soil is a dynamic material in which many chemical, biological, and physical activities go on constantly. It is the result of decay; it is also a medium of growth. It is changing and developing body. Characteristics are changing from season to season.
Too cold, too hot, and dry areas biological activity stops. Organic matter increases when leaves fall and decompose.

6. Explain the significance of weathering?

Ans: a) It is Responsible for the formation of soils through erosion and deposition.

b) Biodiversity is basically depending on depth of weathering.

c) Erosion may not be significant when there is no weathering.

d) Weathering leads mass wasting, erosion and reduction of relief and changes in landforms.

e) Weathering of rocks and deposition helps in the enrichment and concentrations of certain valuable ores of iron manganese, aluminum, copper etc.

7. **What are the characteristics of the different stages of River?**

Ans: Stages of the river

YOUTH

- Streams are few during this stage with poor integration and
- Flow over original slopes showing shallow V-shaped valleys with no floodplains or with very narrow floodplains along trunk streams.
- Streams divides are broad and flat with marshes, swamp and lakes.
- Meanders if present develop over these broad upland surfaces.
- These meanders may eventually entrench themselves into the uplands.
- Waterfalls and rapids may exist where local hard rock bodies are exposed.

MATURE

- During this stage streams are plenty with good integration.
- The valleys are still V-shaped but deep; trunk streams are broad enough to have wider floodplains within which streams may flow in meanders confined within the valley.
- The flat and broad inter stream areas and swamps and marshes of youth disappear and the stream divides turn sharp.
- Waterfalls and rapids disappear.

OLD

STALAGMITES	STALACTITES

- Smaller tributaries during old age are few with gentle gradients.
- Streams meander freely over vast floodplains showing natural levees, oxbow lakes, etc.
- Divides are broad and flat with lakes, swamps and marshes.
- Most of the landscape is at or slightly above sea level.

8. Difference between Stalagmites and stalactites:

• Grow from the floor • Broad base • Formed due to evaporation of water • Broad edge • They are pillar shape	• Grow from the roof • Narrow base • Formed due to condensation • Sharp edge • They are conical shape

9. What is Cirque?

Ans. A deep, long and wide trough or basin with very steep concave high walls at its head as well as in sides is known as **Cirque.**

10. **Difference between gorge and canyon:**

GORGE	**CANYON**
1. steep sides	1. Step like sides
2. equal width of top and bottom	2.wider at the top and narrow at the bottom
3. small in length	3. Longer in length
4. They are found in semi arid lands. E.g. Brahmaputra gorge	4. Found in dry areas. E.g. Grand canyon

11. **Write the concept of sea floor spreading.**

Ans. Seafloor spreading is a process that occurs at mid-ocean ridges, where new oceanic crust is formed through volcanic activity and then gradually moves away from the ridge. Seafloor spreading helps explain continental drift in the theory of plate tectonics.

- It was proposed by Hess in 1961
- He believed that new lava pushes out the plates from the mid oceanic ridge
- Palaeo magnetic studies of the ocean floor reveals that
- Along the mid oceanic ridge there is intense volcanic eruption
- Oceanic crust is much younger than continental crust.
- The sediments of ocean floor is very thins
- Huge amount of lava comes out along the mid Atlantic ridges
- The equidistant rock formations have similar age and chemical compositions & magnetic properties
- Rocks closer to the mid oceanic ridges are young and normal polarity
- The age of rocks increases as the distance increases from the mid oceanic ridge
- Earth quakes are common along the deep sea trenches Positions of continents through geological past.

12. **What was the location of the Indian Landmass during formation of the Deccan Traps?**

Ans. About 140 million years before the present, the subcontinent was located as south as 50°8' latitude. During the movement of the Indian plate towards the Asiatic plate, a major event that occurred was the outpouring of lava and formation of the Deccan Traps. This started somewhere around 60 million years ago and continued for a long period of time. Note that the subcontinent was still close to the equator. From 40 million years and thereafter, the event of formation of the Himalayas took place. Scientists believe that the process is still continuing and the height of the Himalayas is rising even to this date. Hence, the Indian landmass was located South of the Equator during the formation of the Deccan Trap.

13. Mention the forces of the plate movement.

Ans. For much of the last quarter century, the leading theory of the driving force behind tectonic plate motions envisaged large scale convection currents in the upper mantle, which can be transmitted through the asthenosphere.

14. **Why does the earth shake?**

Ans. The release of energy occurs along a fault. A fault is a sharp break in the crustal rocks. Rocks along a fault tend to move in opposite directions. As the overlying rock strata press them, the friction locks them together. However, their tendency to move apart at some point of time overcomes the friction. Rocks along the fault tend to move in opposite directions as the overlying strata press them the friction locks them together. They slide over another: as a result energy releases. Energy waves travel in all directions.

15. **You have already studied geography, history, civics and economics as parts of social studies. Attempt an integration of these disciplines highlighting their interface.**

Ans. All social science disciplines such as History, Civics and Economics study different aspects of social reality. Geography is closely linked with these disciplines. It is an integrated discipline.
(a) Geography and History: The geographical factors have modified the course of history in different parts of the world. Every geographical phenomenon undergoes a change through time and can be explained temporarily. The changes in land forms, climate, vegetation, economic activities, occupations and cultural developments have followed a definite historical course. This, History became the chronological study and Geography became the chorological study.
(b) Geography and Civics: Civics is the study of theoretical, political and practical aspects of citizenship. The core concern of political science is territory, people and sovereignty while political geography is also interested in the study of the state as a spatial unit as well as people and their political behavior.
(c) Geography and Economics: Economics deals with basic attributes of the economy such as production, distribution, exchange and consumption. Each of these attributes also has spatial aspects and here comes the role of economic geography to study the spatial aspects of production, distribution, exchange and consumption.

16. **What is the average height of the Atmosphere?**

Ans. The air is an integral part of the earth's mass and 99 per cent of the total mass of the atmosphere is confined to the height of 32 km from the earth's surface. The air is colorless and odorless and can be felt only when it blows as wind.

17. What is the importance of atmosphere?

Ans. Air is essential to the survival of all organisms. Some organisms like humans may survive for some time without food and water but can't survive even a few minutes without breathing air. That shows the reason why we should understand the atmosphere in greater detail.

18. Define Dust Particles.

Ans. Dust particles are generally concentrated in the lower layers of the atmosphere; yet, convectional air currents may transport them to great heights. The higher concentration of dust particles is found in subtropical and temperate regions due to dry winds in comparison to equatorial and Polar Regions. Dust and salt particles act as hygroscopic nuclei around which water vapor condenses to produce clouds.

19. How does moraine form?

Ans. A **moraine** is material left behind by a moving glacier. This material is usually soil and rock. Just as rivers carry along all sorts of debris and silt that eventually builds up to **form** deltas, glaciers transport all sorts of dirt and boulders that build up to **form moraines**.

20. What is an Outwash Plain?

Ans. An **outwash plain**, also called a sandur (plural: sandurs), sandr or sandar, is a **plain** formed of glacial sediments deposited by melt water **outwash** at the terminus of a glacier. As it flows, the glacier grinds the underlying rock surface and carries the debris along.

21. **What are the elements of weather and climate?**

Ans. Weather is conditions of temperature, humidity, pressure, etc at a given point of time while climate is condition of these elements for a longer period of time. Following are the important elements of weather and climate:

- **Temperature:** A temperature is an objective comparative measurement of hot or cold. It is measured by a thermometer. Several scales and units exist for measuring temperature, the most common being the Celsius scale (with units denoted °C; formerly called degrees centigrade), the Fahrenheit scale (with units denoted °F), and, especially in science, the Kelvin scale (with units denoted K). It affects weather as well as climate.
- **Pressure:** Pressure keeps on decreasing with increase in height. The absolute pressure exerted by the air within the tire, including atmospheric pressure, is 45 pounds per square inch. Pressures less than atmospheric are negative gauge pressures that correspond to partial vacuums.
- **Wind:** Wind is the flow of gases on a large scale. On the surface of the Earth, wind consists of the bulk movement of air. The flow of wind also affects weather and climate.
- **Humidity:** Humidity is the amount of water vapor present in the air. Water vapor is the gaseous state of water and is invisible to the human eye. Humidity indicates the likelihood of precipitation, dew, or fog. Clouds and rain are important factors of climate.

22. Give the reasons why it is summer when earth is far away from the sun and winter when it is nearest to the Sun?

Ans. The solar output received at the top of the atmosphere varies slightly in a year due to the variations in the distance between the earth and the sun. During its revolution around the sun, the earth is farthest from the sun (152 million km) on 4th July. This position of the earth is called aphelion. On 3rd January, the earth

is the nearest to the sun (147 million km). This position is called perihelion. Therefore, the annual insolation received by the earth on 3rd January is slightly more than the amount received on 4th July. However, the effect of this variation in the solar output is masked by other factors like the distribution of land and sea and the atmospheric circulation. Hence, this variation in the solar output does not have great effect on daily weather changes on the surface of the earth.

23. **What is the average distribution of insolation on the surface? Give the reasons for such variation.**

Ans. The insolation received at the surface varies from about 320 Watt/m in the tropics to about 70 Watt/min the poles. Maximum insolation is received over the subtropical deserts, where the cloudiness is the least. Equator receives comparatively less insolation than the tropics. Generally, at the same latitude the insolation is more over the continent than over the oceans. In winter, the middle and higher latitudes receive less radiation than in summer.

24. Define terrestrial radiation.

Ans. The insolation received by the earth is in short waves form and heats up its surface. The earth after being heated itself becomes a radiating body and it radiates energy to the atmosphere in long wave form. This energy heats up the atmosphere from below. This process is known as terrestrial radiation.

The long wave radiation is absorbed by the atmospheric gases particularly by carbon dioxide and the other green house gases. The atmosphere in turn radiates and transmits heat to the space. Finally the amount of heat received from the sun is returned to space, thereby maintaining constant temperature at the earth's surface and in the atmosphere.

25. What are the reasons for Variability of Insolation at the Surface of the Earth?

Ans. The amount and the intensity of insolation vary during a day, in a season and in a year. The factors that cause these variations in insolation are:

i. The transparency of the atmosphere;
ii. The rotation of earth on its axis;
iii. The configuration of land in terms of its aspect.
iv. The angle of inclination of the sun's rays;
v. The length of the day.

26. Explain Earth's heat budget.

Ans. In spite of the enormous transfers of energy into and from the Earth, it maintains a relatively constant temperature because, as a whole, there is little net gain or loss: Earth emits via atmospheric and terrestrial radiation (shifted to longer electromagnetic wavelengths) to space about the same amount of energy as it receives via insolation (all forms of electromagnetic radiation).

To quantify Earth's *heat budget* or *heat balance*, let the insolation received at the top of the atmosphere be 100 units (100 units = about 1,360 watts per square meter facing the sun), as shown in the accompanying illustration. Called the albedo of Earth, around 35 units are reflected back to space: 27 from the top of clouds, 2 from snow and ice-covered areas, and 6 by other parts of the atmosphere. The 65 remaining units are absorbed: 14 within the atmosphere and 51 by the Earth's surface. These 51 units are radiated to space in the form of terrestrial radiation: 17 directly radiated to space and 34 absorbed by the atmosphere (19

through latent heat of condensation, 9 via convection and turbulence, and 6 directly absorbed). The 48 units absorbed by the atmosphere (34 units from terrestrial radiation and 14 from insolation) are finally radiated back to space. These 65 units (17 from the ground and 48 from the atmosphere) balance the 65 units absorbed from the sun in order to maintain zero net gain of energy by the Earth

27. **What is a tornado?**

Ans. A tornado is a violent rotating column of air extending from a thunderstorm to the ground. The most violent tornadoes are capable of tremendous destruction with wind speeds of up to 300 mph. They can destroy large buildings, uproot trees and hurl vehicles hundreds of yards. They can also drive straw into trees. Damage paths can be in excess of one mile wide to 50 miles long. In an average year, 1000 tornadoes are reported nationwide.

28. Explain about Vertical And Horizontal Variation of Pressure

Ans. In the lower atmosphere the pressure decreases rapidly with height. The decrease amounts to about 1mb for each 10 m increase in elevation.

Table gives the average pressure and temperature at selected levels of elevation for a standard atmosphere.

Level	Pressure in mb	Temperature ^{o}C
Sea Level	1.013.25	15.2
1 km	898.76	8.7
5 km	540.48	-17. 3
10 km	265	-49.7

The verticals pressure gradient force is much larger than of the horizontal pressure gradient. But, it is generally balanced by a nearly equal but opposite gravitational force.

Horizontal distribution of pressure is studied by drawing isobars at constant levels. Isobars are lines connecting places having equal pressure. In order to eliminate the effect of altitude on pressure, it is measured at any station after being reduced to sea level for purposes of comparison. Low-pressure system is enclosed by one or more isobars with the lowest pressure in the centre. High-pressure system is also enclosed by one or more isobars with the highest pressure in the centre.

29. What are the Forces Affecting the Velocity and Direction of Wind?

- The air is set in motion due to the differences in atmospheric pressure.
- The air in motion is called wind. The wind blows from high pressure to low pressure, addition; rotation of the earth also affects the wind movement.
- The force exerted by the rotation of the earth is known as the Coriolis force.

30. How Earth's Rotation Affects Winds & Currents

Ans. Our planet's rotation produces a force on all bodies moving relative to the Earth. Due to Earth's approximately spherical shape, this force is greatest at the poles and least at the Equator.

The force, called the "Coriolis effect," causes the direction of winds and ocean currents to be deflected.

In the Northern Hemisphere, wind and currents are deflected toward the right, in the Southern Hemisphere they are deflected to the left.

31. What effect does circulation have on the atmosphere?

Ans. The **circulation** of the **atmosphere** is responsible for about 50% of the transport of energy from the tropics to the poles. The basic mechanism is very simple: hot **air** rises in the tropics, reducing the pressure at the surface and increasing it higher up.

32. What is general circulation of the atmosphere?

Ans. The **circulation** of wind in the **atmosphere** is driven by the rotation of the earth and the incoming energy from the sun. Wind circulates in each hemisphere in three distinct cells which help transport energy and heat from the equator to the poles.

33. Define doldrums.

Ans. **Doldrums**, also called **equatorial calms**, equatorial regions of light ocean currents and winds within the Inter tropical convergence zone (ITCZ), a belt of converging winds and rising air encircling Earth near the Equator. The northeast and southeast trade winds meet there; this meeting causes air uplift and often produce clusters of convective thunderstorms. They occur along the Equator in the Indian and western Pacific oceans and slightly north of the Equator off the African and Central American west coasts. The crews of sailing ships dreaded the doldrums because their ships were often becalmed there; the designation for the resultant state of depression was apparently thus extended to these geographic regions themselves.

34. How do the clouds form?

Ans. Clouds form when rising hot air, through expansion, cools to the point where some of the water vapor molecules "clump together" faster than they **are** torn apart by their thermal energy. Some of that (invisible) water vapor condenses to **form** (visible) **cloud** droplets or ice crystals.

35. **Name different types of precipitation.**

Ans. In meteorology, precipitation is any product of the condensation of atmospheric water vapor that falls under gravity.

The main forms of precipitation include drizzle, rain, sleet, snow, and hail. There are many forms of precipitation like dew, fog, rainfall, snowfall, hails etc.

36. **Why does the amount of water vapor decreases rapidly with altitude?**

Ans. Atmospheric water vapor decreases rapidly with increasing altitude relative to its surface value. The amount of water required to saturate a volume of air depends on the temperature of the air. Air at high temperature can hold more water vapor at saturation than can air at low temperature. The quantity of water vapor existing in the air depends upon the rate of evaporation and the temperature of the air which determines its holding capacity of water vapor. Both temperature and evaporation decreases with altitude

and as a result water vapor also decreases rapidly with altitude. There is absence of water bodies on high altitudes. Temperature also goes on decreasing so the rate of evaporation decreases.

37. What are the characteristics of Tropical Wet Climate (Af) ?

- Tropical wet climate is found near the equator.
- The maximum temperature on any day is around 30 C while the minimum temperature is around 20C.
- Significant amount of rainfall occurs in every month of the year as thunder showers in the afternoon.
- The major areas are the Amazon Basin in South America, western equatorial Africa and the islands of East Indies.
- The temperature is uniformly high and the annual range of temperature is negligible.
- Tropical evergreen forests with dense canopy cover and large biodiversity are found in this climate.

38. **What type of climate conditions would prevail if the sun spots increase?**

Ans. Sunspots are dark and cooler patches on the sun which increase and decrease in a cyclical manner. According to some meteorologists, when the numbers of sunspots increase, cooler and wetter weather and greater storminess occur. A decrease in sunspot numbers is associated with warm and drier conditions. If the sun spots increase, the weather will become cooler and wetter and greater storminess will occur.

39. What are the impacts of climate change?

Ans. As the **climate** warms, it **changes** the nature of global rainfall, evaporation, snow, stream flow and other factors that affect water supply and quality. Specific **impacts** include: Warmer water temperatures affect water quality and accelerate water pollution.

40. How was the Climate in the recent past?

- Historical records of crop yield or crop failures, of floods and migration of people tell about the effects of changing climate.
- The worst devastating drought in the Sahel region, south of the Sahara desert, from 1967-1977 is one such variability.
- A number of times Europe witnessed warm, wet, cold and dry periods, the significant episodes were the warm and dry conditions in the tenth and eleventh centuries,
- Variability in climate occurs all the time. The 1990s recorded the warmest temperature of the century and some of the worst floods around the world.
- During the 1930s, severe drought occurred in southwestern Great Plains of the United States, described as the dust bowl.

41. What is the direction of wind around a low pressure in southern hemisphere?

Ans. Clock wise.

SATISH CHANDRA MEMORIAL SCHOOL

SAMPLE PAPER-2019-20

POLITICAL SCIENCE- CLASS XI

1.What is politics?

2.Who wrote the book Hind Swaraj?

3.Who was Nelson Mandela?

4.Who wrote the book On Liberty?

5.Explain the meaning of the term equality.

6.Write a short note on Right against Exploitation.

7.Who appoints the Prime minister of India?

8.What do you mean by gram sabha?

9.Why did India adopt the FPTP system of election? Give any four reasons.

10.)Though freedom is guaranteed in our constitution, we encounter new interpretations all the time---is this true? Explain.

11.Write the various scopes of politics.

12.What are the various qualifications required to be a candidate for Lok Sabha election?

13.What role did Nelson Mandela play in the freedom struggle of South Africa?

14.Why should we study political theory? Explain.

15.There will be passage based questions of five marks. Prepare from NCERT.

Class XI

Biology

Model Questions Answers

1. What are the advantages of giving scientific name to the organisms?

Ans: Hint: i. universally accepted name

ii. The technical terms gives the glimpses of its relation to the related one.

2. Differentiate between systematic and taxonomy.

Ans: Hint: Systematic deals with evolutionary relationship and taxonomy deals with the classification and naming of organisms. Taxonomy can be considered as a branch of systematics.

3. Discuss the structure of virus and viroid.

Ans: Hint: Virus: i. smaller than even bacteria ii. They can be filtered iii.DNA or RNA could be the genetic material iv. Possess outer covering capsid v. Living only within host cell etc.

Viroid: Smallest infectious pathogenic circular RNA without protein coat.

4. Which class of kingdom fungi has both uni and multicellular members?

Ans: Hint: Ascomycetes

5. Sphagnum has a lot of economic importance – justify.

Ans: Hint: Provide peat used as fuel.

6. What features led to dominance of vascular plants- angiosperms?

Ans: Hint: i. Deep roots, ii. Water proofing material like cutin, iii. Strong woody material for support above ground

7. What do you understand by diplontic cycle of plants?

Ans: Hint:

8. How non chordate differ from chordate?

Difference between chordates and non-chordates	
Chordates	Non-chordates
Notochord present	Notochord absent.
Pharynx is perforated by gill slits.	Gill slits absent.
Heart is ventral.	Heart is dorsal (if present).
Post anal tail is present.	Post anal tail is absent.

9. Enlist the main features of platylminthes with example.

Ans: Hint:

Characteristics:

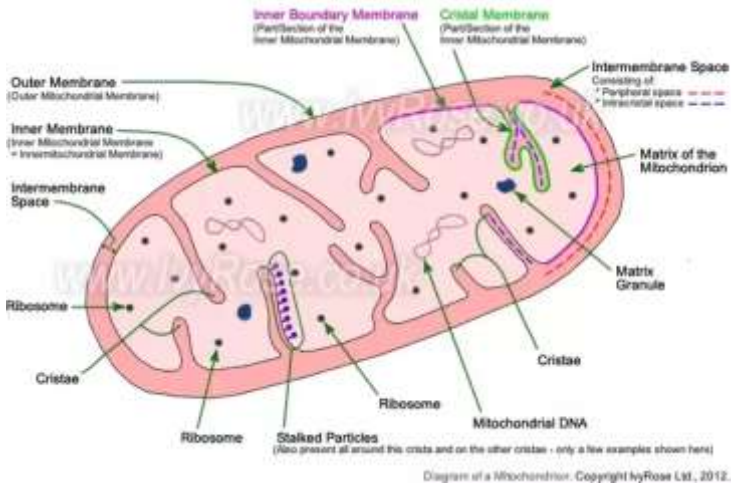
- Triploblastic
  - Ectoderm, mesoderm, endoderm
- Acoelomate
- Bilateral symmetry (w some cephalization)
- Protonephridia = Organs for excretion/osmoregulation
- Flatness allows diffusion for gas exchange
- 80% are parasitic
- Simultaneous hermaphrodites (monoecious)

Eg. Turbellaria

10. Outline the role of coelom in animal.

Ans: Hint: Fluid filled hollow structure acts as protective cushion. It has Immune system like role in invertebrates. Visceral organ lies in coelom.

11. Draw and label structure of mitochondria.



12. Mention one characteristic of gm positive bacteria.

Ans: Hint: Cell wall single layered and without pilli.

13. What is apoenzyme?

Ans: Hint: The protein part of an enzyme.

14. Define protein.

Ans: Hint: Amino acid made with specific three dimensional structure and C, H, O and N main component.

15. What are the functions of endoplasmic reticulum?

Ans: Hint: Elaborate the following points:

i. Manufacture of protein lipid

ii. Membrane biogenesis

iii. Mechanical strength to cell

iv. Increases absorption surface of cell

16.Tomatoes, carrots and chillies are red in colour due to the presence of one pigment? Is it a photosynthetic pigment?
Which property of the pigment is responsible for its ability to initiate the process of photosynthesis? Why is the rate of photosynthesis higher in the red and blue region of spectrum of light?
Ans: Hint:

The pigments are chromoplasts; these are fat soluble carotinoid pigments like carotenes and xanthophylls. These are called accessory pigments; they absorb light and transfer energy to Chlorophyll a.

The wave length of light: the visible light lies between the wave lengths of UV and IR. The most efficient is red light for photosynthesis. Green lights less effective. Maximum photosynthesis takes place in red and blue regions of spectrum of light. Chla and b absorb mostly blue and red light.

17. Why not photorespiration does take place in C4 plants?

Ans: Hint: The reason is that they have a mechanism that increases the concentration of CO2 at the enzyme site. It occurs when C4 acid from mesophyll cell is broken down in bundle sheath cells and releases CO2, hence increasing CO_2 concentration intra cellular. It also ensures that RUBISCO acts as carboxylase to minimize oxygenase activity of it.

18. Why less energy is produced during anaerobic respiration?

Following are the reasons:

- Incomplete breakdown of respiratory substrate.
- Some of the products of anaerobic respiration can be oxidized further to release energy which shows that anaerobic respiration does not liberate the whole energy contained in the respiratory substrate.
- $NADH_2$ does not produce ATP as electron transport is absent.
- Oxygen is not utilized for securing electrons and protons.

19. What is chloride shift? What is its importance?

Ans: Hint: Diffusion of Cl^- from blood plasma into RBC. To maintain ionic balance & electrochemical neutrality.

20. Identify the secondary protein and quaternary proteins in following examples.

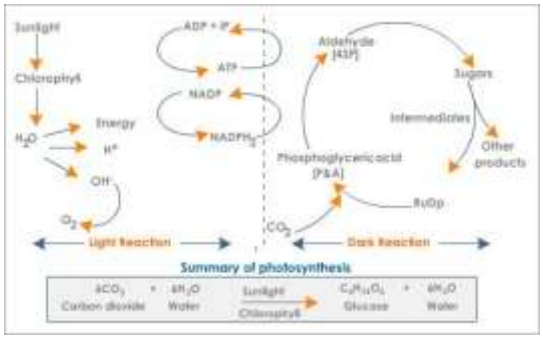
Trypsin, Haemoglobin protein, Myosin protein, Actin protein, Albumin, globulin and explain what is tertiary protein.

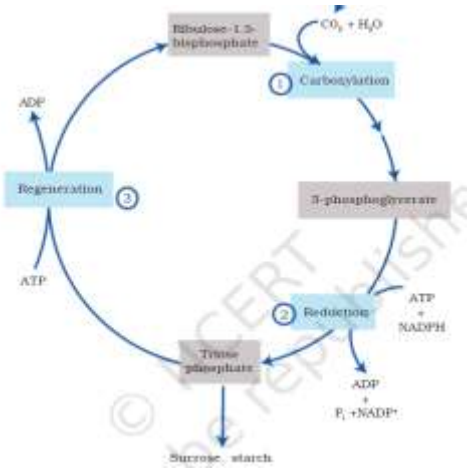
Ans: Hint:

Secondary Protein: Myosin protein, Actin protein, Albumin, globulin, Trypsin Tertiary Protein: (Hemoglobin protein).

21. Mention the steps of Light and Dark reactions.

Ans: Hint: Explain in words with help of the diagrams





22. What is the advantage of having more than one pigment molecule in a photo centre?

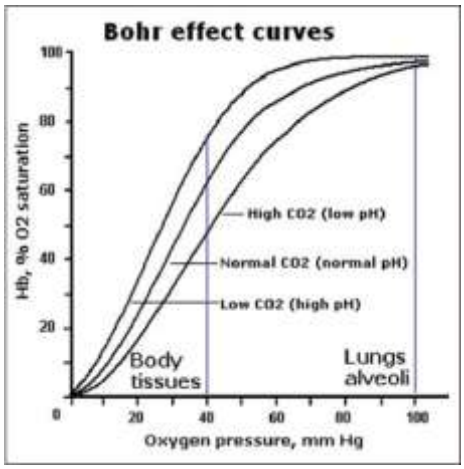
Ans: Hint: Energy trapped in a single molecule is not large enough to start the initial reaction hence, a number of pigment molecules provide protection to the chlorophyll molecule over photo oxidation.

23. What are the differences between oxy and carbominohaemoglobin?

Ans: Hint: OxyHb: Formed by the combination of Oxygen with Fe ion part of Hb and it occurs at the alveolar surface.
Carbominohaemoglobin: Combination with Carbon di oxide with amine radical of Hb and occurs at tissues.

24. What is Bohr's effect?

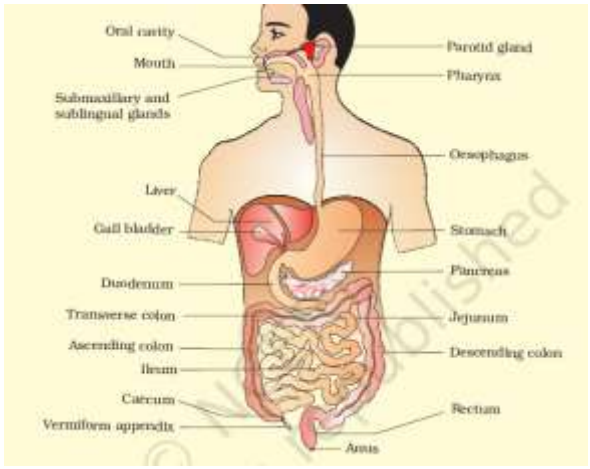
Ans: Hint: Increase in concentration of CO_2 shifts its dissociation curve towards right.



25. What is functional residual capacity?

Ans. Hint: When a person inhales and exhales in a normal way the air volume remains in lungs known as functional residual capacity.

26. Draw and label the digestive system of human.



27. Mention role of intercostal muscle in respiration.

Ans. Hint. Contraction of this with diaphragm increases the volume of thoracic cavity.

28. Explain the role of F_0 F_1 particle in energy production during aerobic respiration.

Ans. Hint. F_1 head piece contains the site of ATP synthesis using proton gradient of ETC.

29. Name three important characteristics of life.

Ans. Hint. Responsiveness, metabolism, growth

30.What is biosphere hot spot?

Ans. Hint. Huge biodiversity eg. Nilgiri BR

31.What do the terms phycobiont and mycobiont signify?

Ans. Hint.Eg. Lichen

32.What do you understand by archaebacteria and eubacteria?

Ans. Hint. Extreme weather tolerant and normal weather living bacteria

33. What is the nature of cell walls in diatoms?

Ans. Hint. Silica made

34.What is the specialty of Mycoplasma cell?

Ans. Hint. Smallest cell PPLO

35.What is the role of sporophylls in pteridophytes?

Ans. Hint. Reproduction

36.Define cryptogamae, angiosperms and gymnosperms.

Ans. Hint. First three division of plantae group; covered seeded plant; naked seeded plant.

37.What is the importance of pneumatic bones and air sacs in aves?

Ans. Hint. To flight against gravity

38.Mention the Phylum of the following animals with proper justification

a) Ascaris b) Dentalium

Ans. Hint.a. nematode- round worm b. Mollusca- soft body

39.What is cnidoblast cell?

Ans. Hint. Found in cnidarian for capturing prey

40.What is spongocoel?

Ans. Hint. Cavity of sponge- poriferan body.

[Note: Question marks will be variable from 1 to 5 depending upon content asked for.]

MODEL QUESTION PAPER CHEMISTRY (CLASS 11)

1 For an actual result of an observation to be 5; two students A and B reported their readings as follows:

	Observation number		Average
	1	2	
Student A	4.95	4.93	4.94
Student B	4.94	5.05	4.995

Which of the students has made a more precise observation? Is his observation accurate too? 1

2 Vitamin C is known to contain 1.29×10^{24} hydrogen atoms. Calculate the number of moles of hydrogen atoms. 1

3 Express 5.607892 to four significant figures and write the result in standard form. 1

4 Express the following in the scientific notation:
(i) 0.0048 (ii) 234,000 (iii) 8008
(iv) 500.0 (v) 6.0012 1

5 The following data are obtained when dinitrogen and dioxygen react together to form different compounds:

	Mass of dinitrogen	Mass of dioxygen
(i)	14 g	16 g
(ii)	14 g	32 g
(iii)	28 g	32 g
(iv)	28 g	80 g

Which law of chemical combination is obeyed by the above experimental data? Give its statement. 1

6 If 2 litres of N_2 is mixed with 2 litres of H_2 at a constant temperature and pressure, then what will be the volume of NH_3 formed? 1

7 Which of these weighs most?
(i) 32 g of oxygen,
(ii) 2 g atom of hydrogen,
(iii) 0.5 mole of Fe, 1

(iv) 3.01×10^{23} atoms of carbon

8 0.5 mole each of H_2S and SO_2 mixed together in a reaction flask, react according to equation:
$2H_2S + SO_2 \longrightarrow 2H_2O + 3S$ 1
Calculate the number of moles of 'S' formed.

9 If 6.023×10^{23} molecules of N_2 react completely with H_2 according to the equation:
$N_2(g) + 3H_2(g) \longrightarrow 2NH_3(g)$, 1
then calculate the number of molecules of NH_3 formed.

10 Which one of the following will have the largest number of atoms?
(i) 1 g Au(s)
(ii) 1 g Na(s) 1
(iii) 1 g Li(s)
(iv) 1 g of Cl2(g)

11 How many significant figures should be present in the answer of the following calculations?
(i) $\frac{0.02856 \times 298.15 \times 0.112}{0.5785}$ 1
(ii) 5×5.364
(iii) $0.0125 + 0.7864 + 0.0215$

12 Calculate the number of atoms present in 1.4 g of N_2 molecule. 1

13 How many electrons in sulphur (Z = 16) can have $n + l = 3$? 1

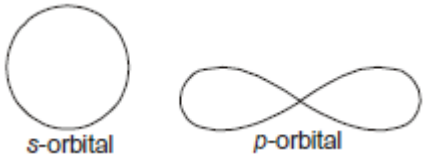
14 State Aufbau principle. 1

15 According to Bohr's model, E_n of each stationary state is given by the expression:
$$E_n = \frac{-1312}{n^2} \text{ kJ mol}^{-1}$$ 1

16 In which of the following set of quantum numbers an electron will have the highest energy?
(i) 3, 2, 1, ½
(ii) 4, 2, –1, –½ 1
(iii) 4, 1, 0, –½
(iv) 5, 0, 0, ½.

17 How many unpaired electrons are there in Ni^{2+} ion? Atomic number of Ni is (28). 1

18 What is physical significance of the lines in the following depictions of atomic orbital? 1



19 What are the possible values of '*m*' for 3*d* orbitals? 1

20 What is the possible value of angular momentum quantum number (*l*) for the unpaired electron in the atom of an element whose atomic number is 17? 1

21 Why is following electronic configuration not correct for ground state of Cr atom?
(Atomic number = 24) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2\ 3d^4$ 1

22 Arrange the elements F, Cl, O and N in the correct order of their chemical reactivity in terms of oxidising property. 1

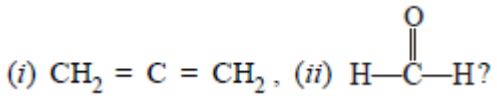
23 Considering the elements B, C, N, F, and Si, the correct order of their non-metallic character is:
(a) B > C > Si > N > F
(b) Si > C > B > N > F
(c) F > N > C > B > Si
(d) F > N > C > Si > B 1

24 The H—S—H bond angle in H_2S is 92.2° whereas the H—O—H bond angle in H_2O is 104.5°, why? 1

25 Which of the following molecules is super octet (having more than 8 electrons)?
CO_2, ClF_3, SO_2, IF_5 1

26 Which out of NH_3 and NF_3 has higher dipole moment and why? 1

27 What is hybrid state of each carbon in



1

28 $Zn(s) + Cu^{2+}(aq) \longrightarrow Zn^{2+}(aq) + Cu(s)$
Is this reaction redox reaction? If yes, name the oxidising agent as well as reducing agent. 1

29 Calculate the oxidation number of P in PO_4^{3-},HPO_3^{2-}. 1

30 What is the oxidation number of S in $Na_2S_4O_6$ and Na_2SO_3? 1

31 Calculate the oxidation number of underlined elements in the following: $Na_2B_4O_7$, OsO_4 1

32 Balance $P + HNO_3 \longrightarrow H_3PO_4 + NO_2 + H_2O$ by oxidation number method. 1

33 Balance $MnO_4^- + Fe^{2+} \longrightarrow Fe^{3+} + Mn^{2+}$ in acidic medium by ion electron method. 1

34 $E^\circ_{Zn^{2+}/Zn} = -0.76\ V$; $E^\circ_{Cr^{2+}/Cr} = -0.74\ V$
$E^\circ_{H^+/H_2} = 0$; $E^\circ_{Fe^{3+}/Fe^{2+}} = 0.77\ V$ 1

Which is the strongest oxidising agent out of them?

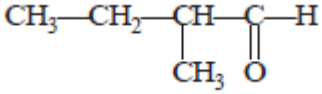
35 Find the oxidation state of sulphur in the following compounds: 1
H_2S, H_2SO_4, $S_2O_4^{2-}$, $S_2O_8^{2-}$ and HSO_3^-

36 Identify the oxidant and reductant in the following reactions: 1
(*i*) $10H^+ + 4Zn(s) + NO_3^-(aq) \longrightarrow 4Zn^{2+}(aq) + NH_4^+(aq) + 3H_2O(l)$
(*ii*) $I_2(g) + H_2S(g) \longrightarrow 2HI(g) + S(s)$

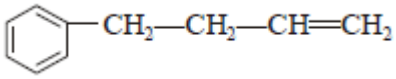
37 Write IUPAC name of the following organic compound: 1
$CH_3—C(CH_3)_2—CH=CH_2$

38 Write structural formula of 3,4,4,5-tetramethylheptane. 1

39 Give the IUPAC name of the following compound: 1



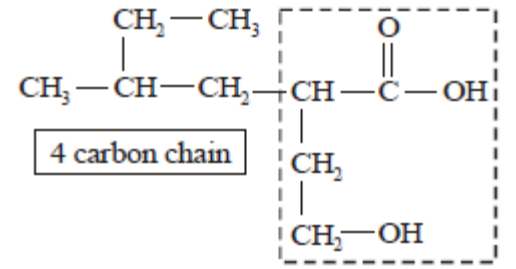
40 Write IUPAC name of the organic compound. 1

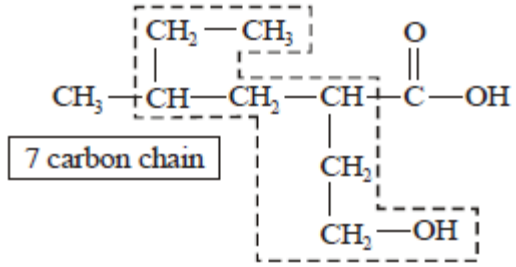


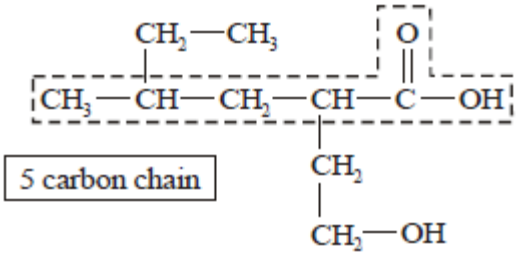
41 Name the method used to purify aniline. 1

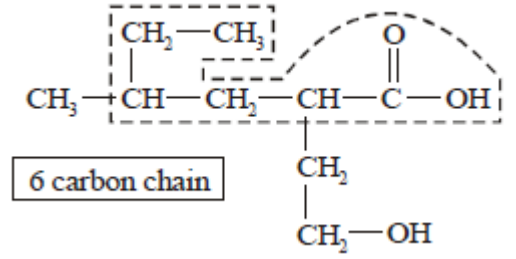
42 Complete the following: 1
$(CH_3COO)_2Pb + Na_2S \longrightarrow$

43 Which of the following selected chains is correct to name the given compound according to IUPAC system? 1









44 56 kg of $N_2(g)$ and 10 kg of $H_2(g)$ are mixed to produce $NH_3(g)$. Calculate the number of moles of ammonia gas formed. 2
(Atomic mass/g mol^{-1} N = 14, H = 1)

45 Balance the following equations:
(i) $H_3PO_3 \rightarrow H_3PO_4 + PH_3$
(ii) $Ca + H_2O \rightarrow Ca(OH)_2 + H_2$ 2
(iii) $Fe_2(SO_4)_3 + NH_3 + H_2O \rightarrow Fe(OH)_3 + (NH_4)_2SO_4$
(iv) Cl_2 NaClO+ + NaOH $\rightarrow$ $NaCl_3 + H_2O$

46 In a reaction $A + B_2 \rightarrow AB_2$
Identify the limiting reagent, if any, in the following reaction mixtures.
(i) 300 atoms of A + 200 molecules of B_2 2
(ii) 2 mol of A + 3 mol of B_2
(iii) 100 atoms of A + 100 molecules of B_2
(iv) 5 mol of A + 2.5 mol of B_2

(v) 2.5 mol of A + 5 mol of B_2

47 Chlorine is prepared in laboratory by treating manganese dioxide (MnO_2) with aqueous hydrochloric acid according to the reaction:
$4HCl(aq) + MnO_2(s) \longrightarrow 2H_2O(l) + MnCl_2(aq) + Cl_2(g)$ 2
How many grams of HCl react with 5.0 g of manganese dioxide?
(Atomic mass of Mn = 55 u, O = 16, H = 1, Cl = 35.5 u)

48 Calculate the uncertainty in position of an electron if uncertainty in its velocity is 0.001%. Mass of electron = 9.1×10^{-31} kg, velocity of electron = 300 m s^{-1}. 2
($h = 6.626 \times 10^{-34}$ kg m^2 s^{-1})

49 Explain giving reason, which of the following sets of quantum numbers are not possible:
(i) $n = 1,\ l = 1,\ m_l = 0,\ m_s = +\frac{1}{2}$
(ii) $n = 0,\ l = 2,\ m_l = -2,\ m_s = -\frac{1}{2}$ 2

50 Calculate (i) wave number and (ii) frequency of yellow radiation having wavelength 5800 Å. 2

51 The threshold frequency v_0 for a metal is 7.0 × 1014 s^{-1}. Calculate the kinetic energy of an electron emitted when radiation of $v = 1.0 \times 10^{15}$ s^{-1} hits the metal. 2

52 Calculate the wavelength of an electron that has been accelerated in a particle accelerator through a potential difference of 100 million volts. 2
(1 eV = 1.6×10^{-19} J, me = 9.1×10^{-31} kg, h = 6.6×10^{-34} J s, c = 3.0 × 108 m s^{-1}).

53 The ionisation energy of hydrogen atom is 1.312 × 106 J mol^{-1}. Calculate the energy required to excite an electron in a hydrogen atom from the ground state to the first excited state. 2
(Avogadro's constant = 6.023×10^{23})

54 The first (IE_1) and second (IE_2) ionisation energies (kJ/mol) of a new element designated by Roman numerals are shown below:

	IE_1	IE_2
I	2372	5251
II	520	7300
III	900	1760
IV	1680	3380

2

Which of these elements is likely to be (i) a reactive metal, (ii) a reactive non-metal, (iii) a noble gas, and (iv) a metal that forms a binary halide of the formula, AX_2?

55 Arrange the following ions in the order of increasing size: 2
Be^{2+}, Cl^-, S^{2-}, Na^+, Mg^{2+}, Br^-

56 A, B, C, D and E have the following electronic configuration: 2

A : $1s^2\ 2s^2\ 2p^1$
B : $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^1$
C : $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^3$

D : $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^5$
E : $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2$.

Which among these belong to the same group in the periodic table?

57 What does atomic radius and ionic radius really mean to you? 2

58 Energy of an electron in the ground state of the hydrogen atom is -2.18×10^{-18} J. Calculate the ionization enthaply of atomic hydrogen in terms of J mol^{-1}. 2
Hint: Apply the idea of mole concept to derive the answer.

59 Among the second period elements, the actual ionization enthalpies are in the order
Li < B < Be < C < O < N < F < Ne.
Explain, why 2
(i) Be has higher $\Delta_i H$ than B?
(ii) O has lower $\Delta_i H$ than N and F?

60 Account for the following :
(i) BF_3 molecule has a zero dipole moment although B—F bonds are polar. 2
(ii) The structure of NH_3 molecule is pyramidal.

61 (i) How many sigma and pi bonds are there in the following molecule.

$CH_2{=}CH{-}CH_2{-}C{\equiv}CH$

(ii) Which type of hybrid orbitals are used by the second carbon atom in the following molecule. 2

$CH{\equiv}C{-}CH_2{-}CH{=}CH_2$

62 You are given the electronic configuration of A, B, C, D and E:
A—$1s^2\ 2s^2\ 2p^6\ 3s^2$, B—$1s^2\ 2s^2\ 2p^6\ 3s^1$,
C—$1s^2\ 2s^2\ 2p^1$, D—$1s^2\ 2s^2\ 2p^5$, E—$1s^2\ 2s^2\ 2p^6$
Write the empirical formula for the substance containing: 2
(i) A and D,
(ii) B and D,
(iii) Only D,
(iv) Only E

63 On the basis of VSEPR theory, predict the shapes of the following molecules and ions:
(i) PH^3
(ii) NH_3 2
(iii) NH_2^-
(iv) H_3O^+

64 Compare the dipole moment of the compounds in each of the following sets: 2

(i) $CHCl_3$, CCl_4
(ii) CF_4, SF_4
(iii) BF_3, BCl_3
(iv) CO_2, SO_2

65 Explain the shapes of the following on the basis of VSEPR theory:
(i) $BeCl_2$
(ii) PH_4^+ 2
(iii) PF_5
(iv) SF_6

66 Balance the following equation in basic medium by ion electron method: 2

$$Cl_2O_7(g) + H_2O_2(aq) \longrightarrow ClO_2^-(aq) + O_2(g)$$

67 Balance the following equation in basic medium by ion electron method: 2

$$P_4(s) + OH^-(aq) \longrightarrow PH_3(g) + H_2PO_2^-(aq)$$

68 Assign oxidation number to the underlined elements in each of the following species:

(*i*) $NaH_2\underline{P}O_4$ (*ii*) $NaH\underline{S}O_4$
(*iii*) $H_4\underline{P}_2O_7$ (*iv*) $K_2\underline{Mn}O_4$ 2
(*v*) $Ca\underline{O}_2$ (*vi*) $Na\underline{B}H_4$
(*vii*) $H_2\underline{S}_2O_7$ (*viii*) $KAl(\underline{S}O_4)_2.12H_2O$

69 What are the oxidation numbers of the underlined elements in each of the following and how do you rationalise your results?

(*i*) $K\underline{I}_3$ (*ii*) $H_2\underline{S}_4O_6$ 2
(*iii*) $\underline{Fe}_3O_4$ (*iv*) $\underline{C}H_3\underline{C}H_2OH$
(*v*) $\underline{C}H_3\underline{C}OOH$

70 Justify that the following reactions are redox reactions:

(*i*) $CuO(s) + H_2(g) \longrightarrow Cu(s) + H_2O(g)$
(*ii*) $Fe_2O_3(s) + 3CO(g) \longrightarrow 2Fe(s) + 3CO_2(g)$
(*iii*) $4BCl_3(g) + 3LiAlH_4(s) \longrightarrow 2B_2H_6(g) + 3LiCl(s) + 3AlCl_3(s)$ 2
(*iv*) $2K(s) + F_2(g) \longrightarrow 2K^+F^-(s)$
(*v*) $4NH_3(g) + 5O_2(g) \longrightarrow 4NO(g) + 6H_2O(g)$

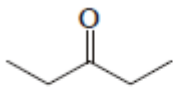
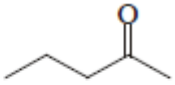
71 In sulphur estimation, 0.157 g of an organic compound gave 0.4813 g of barium sulphate. What is the percentage of sulphur in the compound? 2
[Given: molar mass of $BaSO_4$ = 233 g mol^{-1}]

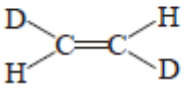
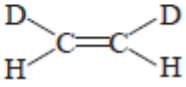
72 Identify 'A' and 'B ' in the following:

$$\boxed{A} \xleftarrow{Na} CH{\equiv}CH \xrightarrow[873\ K]{\text{Red hot iron tube}} \boxed{B}$$

2

73 What is the relation between the following pairs?
Are they structural or geometrical isomers? 2

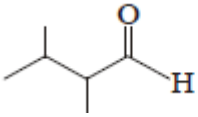
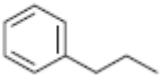
(*i*)  and 

(*ii*)  and 

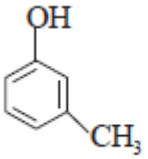
74 (i) Draw cis and trans-structures for Hex-2-ene. Which isomer will have higher boiling point and why? 2

(*ii*) Explain why  is not aromatic.

75 Give IUPAC name of the following compounds: 2

(*i*)  (*ii*) 

76 Write the IUPAC names of the following compounds: 2

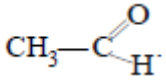
(*i*) 

(*ii*) $CH_3—CH(CH_3)CH=CH—CH_2—COOH$

77 (i) Which of the following species act as nucleophiles?

$\ddot{N}H_3$, BF_3, $\overset{+}{N}O_2$ and $C_2H_5\ddot{O}:^-$

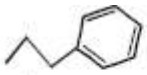
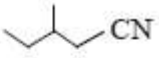
(ii) Identify the electrophilic centre in 2

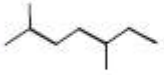
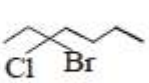


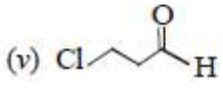
78 What are hybridisation states of each carbon atom in the following compounds: 2

$CH_2=C=O$, $CH_3CH=CH_2$,
$(CH_3)_2CO$, $CH_2=CHCN$, C_6H_6

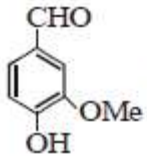
79 Give the IUPAC name of the following compounds:

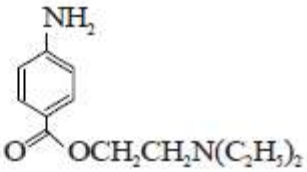
(*i*)  (*ii*) 

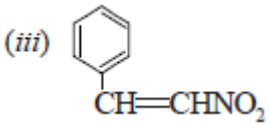
(*iii*)  (*iv*) 

(*v*)  (*vi*) Cl_2CHCH_2OH

80 Identify the functional groups in the following compounds: 2

(*i*) 

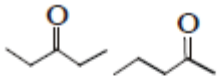
(*ii*) 

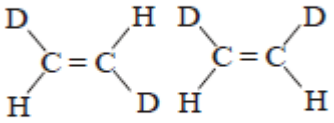
(*iii*) 

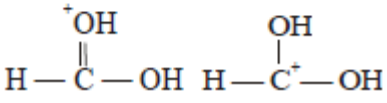
81 In the Lassaigne's test for nitrogen in an organic compound, the Prussian blue colour is obtained due to the formation of: 2

(*i*) $Na_4[Fe(CN)_6]$ (*ii*) $Fe_4[Fe(CN)_6]_3$
(*iii*) $Fe_2[Fe(CN)_6]$ (*iv*) $Fe_3[Fe(CN)_6]_4$

82 What is the relationship between the members of following pairs of structures? Are they structural, geometrical isomers or resonance contributors? 2

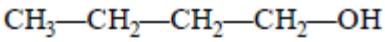
(*i*) 

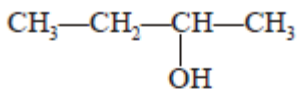
(*ii*) 

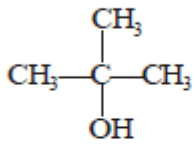
(*iii*) 

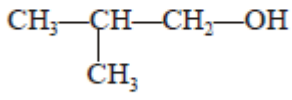
83 0.35 g of an organic compound was Kjeldahlised. The ammonia evolved on distilling the Kjeldahlised extract with 100 ml of M/10 H_2SO_4. The residual acid required 154 ml of M/10 NaOH for complete neutralization. Calculate the percentage of nitrogen in organic compound. 2

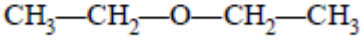
Note: Consider structures I to VII and answer the questions 39-42.

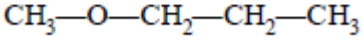
I. 

II. 

III. 

IV. 

V. 

VI. 

VII.