SOUTH AMERICA: LOCATION AND PHYSICAL FEATURES

Tick (✓) the correct answer

1. Two thirds of South America lies in the Tropical regions. In which zone does the remaining one-third of South America lie?

2. In which zone are the countries that lie between the latitudes 23.27 degrees north and 23.27 degrees south located in Latin America?
a. Tropical zone   c. Rainforest   b. Andes mountain range   d. Central plains

3. Which of these is not one of the active volcanoes that the Andes are made up of?

4. What is the extent of the Andean Cordillera?
a. Atlantic Ocean to Cape Horn   b. Caribbean Sea to Cape Horn   c. North Atlantic Ocean to Cape Horn   d. Gulf of Panama to Cape Horn

5. Which of these descriptions best fits the ranges of the Andes?
a. Old fold mountains   b. Ranges are not parallel   c. Old fold and parallel range   d. Parallel, higher on the western side and steep slopes on the eastern side, young fold

6. Which of these are famous plateaus located in South America?

7. The important plains of South America are

8. Which river drains the continent of South America?

9. Which two types of deserts, one in the Temperate zone and the other in the Tropical zone are located in South America?
a. Kalahari (hot) and Gobi (cold)   b. Sonaran Desert (hot) and Takla Makan Desert (cold)   c. Patagonia (cold) and Atacama   d. Simpson Desert (hot) and Great Victorian Desert (cold)

10. What is the other name for the Central Plains? Where are they located and which are the river basins that form them?
a. Llanos, Orinoco river basin   b. Selvas, Amazon river basin   c. Gran Chaco, La Plata river basin   d. Central Lowlands, located between Andes and Eastern Highlands and formed by the Orinoco, Amazon and La Plata river basins

11. Use the Political map of South America to answer the questions below:

   Political Map of South America

i. What is the capital of Argentina?

ii. Which country borders the Pacific Ocean?
a. Uruguay   b. Brazil   c. Paraguay   d. Chile

iii. Which of these countries is farthest north?
a. Venezuela   b. Peru   c. Ecuador   d. Argentina

iv. What is the capital of Paraguay?
a. Montevideo   b. Asuncion   c. Sucre   d. Lima

v. Which city lies directly west of Caracas, Venezuela?

vi. Which of these countries borders the Atlantic Ocean?
a. Chile   b. Peru   c. Ecuador   d. Uruguay

vii. Which of these countries has no ports?
a. Bolivia   b. Argentina   c. Guyana   d. Brazil

viii. What is the capital of Ecuador?

ix. About how far is Santiago, Chile from the capital of Paraguay?
a. 500 miles   b. 1,000 miles   c. 2,000 miles   d. 3,000 miles

x. Which city lies directly east of Buenos Aires?
11. Which important lines of latitude pass through the continent of South America, which parts of the continent do these pass through?
   a. Tropic of Cancer (Northern) and Tropic of Capricorn (Southern)
   b. Equator (Northern) and Tropic of Capricorn (Southern)
   c. Arctic Circle (Northern) and Equator (Southern)
   d. Equator (Northern) and Antarctic Circle (Southern)

4. On which side of the Andes Mountains is the Atacama Desert and the Patagonia Desert located, which are the cardinal directions in which these fall?
   a. Windward, eastern and western
   b. Leeward, eastern and western
   c. Leeward, western and eastern
   d. Windward, North-west and South-east

5. What factors are responsible for causing heavy rainfall in most parts of South America?
   a. Equatorial Zone, Westerlies and Easterlies
   b. Equatorial Zone, Westerlies and Polar Westerlies on the eastern side, and young fold
   c. Equatorial Zone, Polar easterlies and Polar westerlies
   d. Tropical Zone, Trade winds and Westerlies

6. What impact does the location of South America in the Tropic, Sub-Tropic and Sub-Antarctic zones have on the climate of the continent?
   a. Equatorial, Tropical, Temperate, Mediterranean Hot and Cold Desert, Marine and Highland
   b. Temperate, Tropical and Sub-Tropical
   c. Equatorial and Temperate
   d. Equatorial, Sub-Tropical and Temperate

7. What is the main difference between the hot desert and the cold desert type of climate?
   a. Hot and cold
   b. Hot deserts receive no rainfall and have a large range of variation between summer and winter temperatures
   c. Hot and dry, and cold and dry
   d. Extreme temperatures and rainfall

8. Which winds are primarily responsible for causing rainfall in two climatic regions of south-western South America? Name the climatic regions.
   a. Trade winds, Hot Desert and Tropical Climate
   b. Westerlies, Equatorial and Tropical
   c. Trade winds, Temperate and Marine
   d. Westerlies, Cold Desert and Mediterranean

9. What are the two reasons responsible for Brazil and Guyana Highlands receiving heavy rainfall throughout the year?
   a. Close proximity to the tropics
   b. Westerlies
   c. Both regions lie within the Equatorial belt and are under the influence of the North-east and South-east Trades
   d. Both regions are situated in the Temperate region

10. The Trade winds and the Westerlies bring rainfall to major parts of South America. Which region of South America is not under the influence of these winds and what is the likely impact?
    a. North-western part, no rainfall
    b. North-western part, southern part and no rainfall in these regions
    c. Western part, no rainfall
    d. South-western parts, no rainfall

11. Study the map and answer the questions that follow:
    i. What type of vegetation and wildlife is found in the Selvas?
    a. Softwood trees and tigers
    b. Coniferous trees and polar bears
    c. Hardwood trees, macaws, Anacondas and snakes
    d. Evergreen trees and elephants

12. ii. What kind of vegetation is found around the Chirco river basin and the Brazilian Highlands?
     a. Deciduous grasslands
     b. Shrubs and evergreen trees
     c. Soft short grass
     d. Tall coarse grasses

iii. What is the main difference in the vegetation found in the warm temperate forests and cool temperate forests?
     a. Grasslands, warm Temperate forests and Evergreen trees in Cool Temperate forests
     b. Softwood trees in warm Temperate forests and hardwood trees in Cool Temperate forests
     c. Evergreen trees in Warm Temperate forests and coniferous trees in Cool Temperate forests
     d. Dense Evergreen forests in Warm Temperate forests and Coniferous trees in Cool Temperate forests

iv. In which country in South America are two types of vegetation found, name the types of vegetation found there?
    a. Venezuela, Mountain vegetation and Tropical grasslands
    b. Argentina, Warm Temperate forests and desert vegetation
    c. Chile, Cool Temperate forest and Mediterranean vegetation
    d. Brazil, Mountain vegetation and Equatorial rainforest

v. Which two types of vegetation can be found in regions parallel to each other, along the western margins of the continent?
    a. Warm Temperate forest and the Mediterranean
    b. Mountain vegetation and the Desert Vegetation
    c. Tropical grassland and the Warm Temperate
    d. Equatorial forests and the Temperate Grasslands

Study the map below and answer the questions that follow:

i. What is the ‘El Nino’ Effect and which currents are responsible for causing this effect?
   a. Disturbance in ocean water circulation every 2-7 years, El Nino (Warm Current) Peru River Current (cold)
   b. Ocean disturbances, Brazil (Warm Current) and Falkland (Cold Current)
   c. Ocean disturbances, Caribbean (Warm Currents) and Falkland (Cold Current)
   d. Ocean disturbances, South Equatorial (Warm Current) and Peruvian current (Cold Current)

ii. Which of these countries in South America is likely to experience Tropical type of climate?
    a. Ecuador, Colombia and Venezuela
    b. Peru, Bolivia and Chile
    c. Brazil, Bolivia and Paraguay
    d. Argentina, Chile and Uruguay

iii. Which countries experience the Mediterranean type of climate?
    a. Argentina and Bolivia
    b. Argentina and Chile
    c. Argentina and Venezuela
    d. Argentina and Uruguay

iv. Which of these best describes the ‘Marine’ type of climate?
    a. Hot and dry
    b. Hot and wet
    c. Moderate temperatures and heavy rainfall
    d. Low range of temperature, cool temperatures and heavy rainfall

v. Which regions of South America experience the ‘Highland’ type of climate?
    a. The Western Mountains
    b. Brazilian Highlands
    c. Andes
    d. Gran Chaco

vi. Which city lies directly east of Buenos Aires?
Tick (✓) the correct answer

1. Peru is an important supplier of
   a. Silver and copper  b. Fruits and vegetables  c. Sugar cane  d. Lumber

2. Which of these has contributed to the deforestation of the Amazon rainforest?
   a. Demand for hardwoods like Mahogany and Cedar  
   b. Clearing of forests for cattle to graze  
   c. Clearing of land for farming  
   d. All of the above

3. If you lived along the Amazon River, which of the following would you be LEAST likely to do for a living?

4. South America utilises 10 per cent of its land for the cultivation of crops, the countries in South America where crops are cultivated are
   a. Peru  
   b. Argentina, Uruguay, Chile, Brazil, Colombia and Ecuador  
   c. French Guyana  
   d. Guyana and Surinam

5. What are the primary industries of South America?
   a. Fishing  
   b. Education  
   c. Trades  
   d. Fishing, animal rearing, mining, agriculture

6. Where is the best fishing ground in South America located?
   a. Coast of Chile, California (Cold) meets an Equatorial counter clockwise current (Warm)  
   b. Peruvian and Chilean Coast, Peruvian Current (Cold) meets the South Equatorial Current (Warm)  
   c. Coast of Argentina, Falkland (Cold) meets Brazilian (War)  
   d. Brazilian coast, Caribbean Current (Warm) meets the El Nino Current (Warm)

7. Only a few of the countries in South America are industrialised, name the countries that are industrialised?
   a. Peru, Ecuador, Colombia and Bolivia  
   b. Guyana, Surinam, French Guyana and Paraguay  
   c. Brazil, Argentina, Chile and Venezuela  
   d. Paraguay, Uruguay, Bolivia and Peru

8. Which are the major industries located in South America?
   d. Chemical industries

9. Livestock rearing is practised on Llanos, Campos and Pampas, which country in South America is likely to have a leather industry?
   a. Brazil and Argentina  b. Paraguay  c. Brazil and Paraguay  
   d. Argentina

10. Which countries in South America have well developed hydroelectric resources?
    a. Peru, Colombia, Chile and Ecuador  
    b. Brazil, Argentina, Paraguay and Venezuela  
    c. Paraguay, Uruguay and Peru  
    d. Peru, Chile, Argentina and Bolivia

11. Study the maps below and attempt the questions that follow:
    i. Sheep rearing is practised on dry hilly regions, in which parts of South America is sheep rearing practised?
       a. Western Mountains and Patagonia  
       b. Western Mountains and Western Coastal Strip  
       c. Argentina, parts of Chile and Eastern slopes of Andes  
       d. Guyana Highlands

    ii. Which of these countries is a major centre for the cattle rearing industry?
THE ANTARCTICA

Tick (✓) the correct answer

1. What is the approximate area of the continent of Antarctica?
   a. 1 million square miles c. 5 million square miles
   b. 3 million square miles d. 7 million square miles
2. Where can 70 percent of the world’s fresh water be found?
   a. East Antarctica c. West Antarctica
   b. The Antarctica ice cap d. The Antarctic ice shelf
3. The Atlantic, Indian and the Pacific Oceans meet to form the
   a. Amundsen Sea c. Northern Ocean
   b. Antarctic Ocean d. Southern Ocean
4. Which of the following animals live along the coast of Antarctica?
5. What types of landforms are found on the continent of Antarctica?
   a. Plateaus, plains and mountains
   b. Hills and valleys
   c. Canyons and gorges
   d. Ice sheets, dry valleys, ice shelves and ice
6. Which of these are the major seas surrounding the continent?
   a. The Laptev Sea, Chukchi Sea and the East Siberian Sea
   b. The Bering Sea, Tasman Sea and the Timor Sea
   c. The Greenland Sea, Barents Sea, and the Beaufort Sea
   d. The Weddell Sea, Amundsen Sea and the Ross Sea
7. Inspite of being the coldest continent, Antarctica has dormant and active volcanoes because
   a. It is located on the Antarctic Plate
   b. It has been formed from ice sheets
   c. It is situated on the ‘Pacific Ring of Fire’
   d. These volcanoes are a part of the Trans-Antarctic Mountains
8. What weather changes occur on the ‘White Continent’?
   a. Blizzards and slight snowfall
   b. Blizzards, fog during summers and no sunlight
   c. Frozen ice sheets
   d. Temperatures below freezing point
9. How does the ‘Antarctic Circle’ cut across the continent of Antarctica?
   a. Cuts across the continent from west to east
   b. Divides the continent into half
   c. Does not cross the continent
   d. Touch the northern and the eastern tip of the continent
10. Which of these are the potential resources of Antarctica?
    a. Silver, platinum, zinc and lead
    b. Cobalt and aluminium
    c. Copper, gold, iron ore, zinc, oil, natural gas and uranium
    d. Tin, lead and bauxite
11. Study the map below and attempt the questions that follow:
    i. What kind of wildlife thrives in Antarctica?
       a. Seals and humped back whales
       b. Polar bears
       c. 40 species of birds, penguins, krill, squid, Antarctic cod, ice fish, plunder fish, seals and whales
       d. Seals
    ii. Mt. Erebus is located on the shores of the
        a. Weddell Sea c. Indian Ocean
        b. Amundsen Sea d. Ross Sea
    iii. In which part of Antarctica is the Vinson Massif located?
         a. Lesser Antarctica c. East Antarctica
         b. est Antarctica d. Greater Antarctica
    iv. What is the shape of the continent of Antarctica?
        a. Rectangular c. No defined shape
        b. Circular d. Triangular
    v. What is the climatic zone in which Antarctica is situated?
       a. Tropical zone c. Polar zone
       b. Temperate zone d. Sub-Temperate zone
    vi. Which of these is the coldest?
        a. Iceland c. Russia
        b. Arctic region d. Antarctica
    vii. Which meridians pass through the centre of the continent of Antarctica?
         a. 360 meridian c. 180 meridian
         b. 180 latitude d. 360 latitude
    viii. The permanent India station located on Antarctica is?
          a. McMurdo c. Dakshin Gangotri
          b. Maitre d. M.V. Polar Circle
    ix. How many Indian expeditions have been sent to Antarctica?
        a. 20 c. 21
        b. 22 d. 23
    x. When was the Antarctic Treaty signed, and what was the duration of this agreement?
       a. 1960, 29 years c. 1958, 28 years
       b. 1959, 30 years d. 1957, 27 years
HYDROGEN

Tick (√) the correct answer

1. Hydrogen atom has
   a. Two neutrons   c. No neutrons
   b. One neutron    d. Three neutrons

2. Hydrogen is produced by
   a. Electrolysis of water   c. Using elemental hydrogen
   b. Decomposition of sodium   d. Using solar energy

3. The catalyst used in Haber’s process is
   a. Calcium oxide   c. Copper oxide
   b. Iron oxide     d. Zinc oxide

4. Hydrogen is used as rocket fuel because
   a. It generates a large amount of heat and energy while burning
   b. It is easily produced from water
   c. It is easy to transport
   d. It is used for hydrogenation of fuel

5. Hydrogen is collected in downward displacement because
   a. It is heavier than air
   b. It is highly combustible
   c. It is soluble in water
   d. It is lighter than water and is insoluble

6. Hydrogen is not used as car fuel because
   a. It is not combustible
   b. It is highly inflammable
   c. It emits toxic gases on burning
   d. It produces very little energy

7. Hardening of vegetable oils is done by
   a. Hydrogenation   c. Electrolysis
   b. Neutralisation  d. Thermolysis

8. Hydrogen can be prepared by reacting
   a. Zinc and oxygen   c. Zinc and water
   b. Zinc and hydrogen d. Zinc and hydrochloric acid

9. The process of removing oxygen from their compounds is called
   a. Reduction   c. Displacement
   b. Oxidation   d. Ignition

10. Hydrogen bonding occurs between
    a. A hydrogen atom and a highly electronegative molecule or atom
    b. A hydrogen atom and a highly electropositive molecule or atom
    c. Free gases
    d. Oxides

Fill in the blanks:

11. Hydrogen burns in ________________ to form water

12. Zn + 2HCl = ZnCl₂ + ______________

13. CuO + H₂ = _________________ + _________________

14. The compounds formed by the reaction of hydrogen with metals are called ________________.

15. In displacement reaction, the ___________ active metal displaces _________ active metal from a compound.

State whether the following statements are true or false:

16. Hydrogen can exist in its elemental form [ ]

17. Hydrogen is the lightest gas [ ]

18. Hydrogen is highly soluble in water [ ]

19. For welding, hydrogen is used as it produces energy while burning [ ]

20. Like oxygen, hydrogen supports combustion [ ]
CARBON AND ITS COMPOUNDS

Tick (✓) the correct answer

1. Which of the following natural process is a combustion reaction?
   a. Fertilisation  c. Digestion
   b. Pollination  d. Excretion

2. In combustion, a given substance reacts with
   a. Chemicals  c. Nitrogen
   b. Carbon dioxide  d. Oxygen

3. The lowest temperature at which a substance catches fire is called
   a. Freezing temperature  c. Burning temperature
   b. Ignition temperature  d. Boiling point

4. When a match is struck against rubbing surface, the phosphorous
   a. Reaches its ignition temperature
   b. Reacts with the cardboard
   c. Reacts with water vapour present in the air
   d. Does not burn

5. If an electrical gadget catches fire, we should
   a. Pour water on the flames
   b. Switch off the gadget
   c. Pull the plug out of the socket
   d. Use a blanket to cover the flame

6. A fire extinguisher
   a. Decreases the ignition temperature
   b. Decreases the temperature of the air
   c. Cuts off the air supply
   d. Increases the temperature of air

7. Petroleum is found
   a. Between impervious rocks and water
   b. Between impervious and permeable rocks
   c. Between porous rocks
   d. Mixed with ocean water

8. The useable component of natural gas is
   a. Diesel  c. Methane
   b. LPG  d. Butane

9. Which one of the following is not an advantage of using compressed natural gas?
   a. It needs large storage space and difficult to detect in case of leakage
   b. It does not leave residue on burning
   c. Can be easily transported through pipes
   d. It is cheaper than other fossil fuels

10. Petroleum is separated into components by using
    a. Filtration  c. Distillation
    b. Purification  d. Fractional distillation

Fill in the blanks with the words provided:
Calorific value, Yellow, Heat energy, Chemical energy, Carbon dioxide, Ignition temperature, Paraffin wax

11. A good fuel should have low ________________

12. On burning, the fuels produce large amounts of ________________

13. Fuels cause pollution due to the release of ________________

14. The ________________ part of the flame consists of carbon particles

15. ________________ is used to make candles

State whether the following statements are true or false:

16. The flammable part of a match stick is made up phosphorus

17. Coal has a higher calorific value than petrol

18. The flame of LPG is blue as it undergoes complete combustion

19. Compressed natural gas is prepared by using sewage and cow dung

20. Petrochemicals are used to manufacture plastic
THE STRUCTURE OF AN ATOM

Tick (✓) the correct answer

1. The nucleus of an atom consists of
   a. Protons and electrons  c. Protons and electrons
   b. Protons and neutrons  d. Neutrons and electrons

2. The electronic configuration of sodium is
   a. 2,8,1  c. 2,8,0
   b. 2,8,8  d. 2

3. Protium, deuterium and tritium isotopes of hydrogen have
   a. Different atomic numbers  
   b. Different mass numbers  
   c. Different number of electrons  
   d. Different number of neutrons

4. The structure labelled Y has a
   a. Positive charge  c. No charge
   b. Negative charge  d. Both positive and negative charges

5. An element X has 17 protons, 17 electrons and 18 neutrons. What is the atomic number for this element?
   a. 17  c. 35
   b. 18  d. 16

6. Two elements are found to have the same mass number, they are
   a. Isotopes  b. Isobars  
   c. Sub atomic particles  d. Devoid of nucleus

7. An element is represented as C-14. What does the number 14 represent?
   a. Its atomic number  c. Number of protons
   b. Number of neutrons  d. Its mass number

8. The spontaneous disintegration of unstable nuclei, by emission of particles in the form of radiation is called
   a. Spontaneous inactivity  c. Radioactivity
   b. Disintegration  d. Spontaneous decomposition

9. An alpha particle has
   a. 2 protons and 2 neutrons  
   b. 1 proton and 1 neutron  
   c. 1 proton and 2 neutrons  
   d. 2 protons and 1 neutron

10. As compared to a neutral atom of chlorine, the negatively charged chlorine ion has
    a. The same number of electrons as a neutral atom  
    b. Less electrons than a neutral atom  
    c. More electrons than a neutral atom  
    d. More number of protons than a neutral atom

Answer the following:

11. Write the electronic configuration of the following elements.
    a. Neon (Atomic number 10)  
    b. Carbon (Atomic number 6)  
    c. Argon (Atomic number 18)

12. If an element has a mass number of 23. It has 11 electrons. Calculate
    a. Atomic number  
    b. Number of protons  
    c. Number of neutrons

Match the following:

<table>
<thead>
<tr>
<th>Column A</th>
<th>Column B</th>
</tr>
</thead>
<tbody>
<tr>
<td>13. A device in which electrons travel as rays from negative to positive</td>
<td>a. Chadwick</td>
</tr>
<tr>
<td>14. Proposed that cathode ray is a stream of negatively charged particle moving at high speed</td>
<td>b. Rutherford</td>
</tr>
<tr>
<td>15. Discovered the nucleus of an atom</td>
<td>c. Bohr</td>
</tr>
<tr>
<td>16. Suggested that electrons move around a nucleus in a set orbit</td>
<td>d. J.J. Thomson</td>
</tr>
<tr>
<td></td>
<td>e. Cathode ray tube</td>
</tr>
</tbody>
</table>
TRANSFORMATION OF SUBSTANCES

Tick (✓) the correct answer

1. In electroplating, the pure metal is
   a. At cathode  c. In the electrolyte
   b. At anode  d. A catalyst

2. In a chemical reaction, a hydrocarbon like glucose reacts with oxygen, this is an example of
   a. Combustion  c. Reduction reaction
   b. Displacement reaction  d. Neutralisation reaction

3. Identify the type of reaction and choose the balanced chemical equation for the following reaction
   Magnesium + water → Magnesium hydroxide + hydrogen
   a. Single replacement; Mg + H₂O → Mg(OH)₂ + H₂
   b. Double replacement reaction; Mg + 2H₂O → Mg(OH)₂ + H₂
   c. Neutralisation reaction, Mg + 2H₂O → Mg(OH)₂ + H₂
   d. Single replacement; Mg + 2H₂O → Mg(OH)₂ + H₂

4. Crude oil can be separated into different components by
   a. Fractional distillation  c. Distillation
   b. Electrolysis  d. Filtration

5. Which one of the following processes is not an exothermic reaction?
   a. Respiration  c. Digestion
   b. Photosynthesis  d. Fusion reaction in the Sun

6. In the following chemical equation, identify the precipitate HCl + AgNO₃ → AgCl + HNO₃
   a. HCl  c. AgCl
   b. AgNO₃  d. HNO₃

7. When there is exactly the same number and type of atoms on both sides of an equation, the equation is
   a. Unbalanced  c. Incomplete
   b. Balanced  d. Reduced

8. The chemical equation 2H₂ + O₂ → 2 H₂O represents
   a. Synthesis reaction
   b. Double displacement reaction
   c. Decomposition reaction
   d. Displacement reaction

9. The reaction between an acid and a base always produces
   a. Oxygen  c. Water
   b. Carbon dioxide  d. Hydrogen

10. The electrolysis of water resulting in hydrogen and oxygen is a type of
    a. Synthesis reaction  c. Displacement reaction
    b. Decomposition reaction  d. Neutralisation reaction

Fill in the blanks:
Oxidation, Chemical, Reactants, Endothermic reaction, Reduction, Exothermic reaction, Products

11. Rusting of an iron car and formation of oxides is caused due to __________ reaction.

12. Pure metals are produced by ores by ____________.

13. A homogeneous, opaque, red solid is placed in sunlight and after a period of time it becomes a homogeneous, opaque, orange solid due to ____________ change

14. The compounds or molecules that undergo chemical reactions are called ________________.

15. The reaction in which heat energy is absorbed is called ________________.

State whether the following statements are true or false:

16. The bending of an iron nail is due to its chemical property

17. The chemical change may be accompanied by emission of gas and release of energy

18. The freezing point of water increases due to the presence of impurities

19. Respiration is an exothermic process

20. Chemical reactions change a compound temporarily
BOHR’S CONCEPT OF ATOMIC MODEL

Tick (✓) the correct answer

1. Which statement is false for Bohr’s model of the atom?
   a. Electrons revolve around the nucleus in circular orbits
   b. The orbit closest to the nucleus is the K shell
   c. All shells have an equal energy level
   d. Each shell is associated with a definite amount of energy

2. Which drawback of earlier models has been explained in Bohr’s model of the atom?
   a. Maxwell law of electrodynamics
   b. Atomic spectra of multi-electron atoms
   c. Shape of molecules
   d. Both (a) and (c)

3. Which of the following is explained by Bohr in his atomic model?
   a. The Stark effect and The Zeeman effect
   b. Calculation of energy of the He+ electron
   c. Heisenberg’s uncertainty principle
   d. None of these

4. According to Bohr
   a. If an electron gains energy, it moves a way from the nucleus
   b. An electron loses energy in ground state also
   c. An electron emits energy in the form of radiation when it moves from higher energy states to lower energy states
   d. Both (a) and (c).

5. The radius of energy in Bohr’s orbit is equal to integral multiples of
   a. 0.529  b. 0.53
   c. 6.529  d. 13.6

6. An element has 4 electrons in the M shell. The atomic number of element is
   a. 4      b. 8
   c. 12     d. 14

7. An increasing order of the energy level of sub-shells within any shell is
   a. d<f<p<s  b. s<d<p<f
   c. s<d<p<f  d. None of these

8. Who modified Bohr’s theory by introducing elliptical orbits for an electron path?
   a. Rutherford  b. Chadwick
   c. Sommerfield  d. Newton

9. The number of orbitals available in the M shell is
   a. 2     b. 3
   c. 4     d. None of these

10. The Angular momentum of an electron in a shell is quantized, this was proposed by
    a. John Dalton  b. Bohr
    c. J.J. Thomson  d. Rutherford

11. Match the following as per their correlative property:

<table>
<thead>
<tr>
<th>Column I</th>
<th>Column II</th>
</tr>
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<tbody>
<tr>
<td>[i] K-shell</td>
<td>(a) 32 e</td>
</tr>
<tr>
<td>[ii] L-shell</td>
<td>(b) 2 e</td>
</tr>
<tr>
<td>[iii] N-shell</td>
<td>(c) 18 e</td>
</tr>
<tr>
<td>[iv] M-shell</td>
<td>(d) 8 e</td>
</tr>
</tbody>
</table>

State whether the following statements are True or False:

12. Bohr derived that emission of energy by an atom must be quantized
    True / False

13. The chemical properties of an atom are determined by its nuclear charge
    True / False

14. The modern atomic mass unit is based on the mass of $\frac{12}{6}$
    True / False

Answer the following:

15. An element with mass number 81 contains 31.7% more neutrons as compared to protons. Assign the symbol to the element.
    _________________________________
    _________________________________
    _________________________________

16. An ion with mass number 63 contains 2 units of positive charge and 25.92% more neutrons than electrons. Assign a symbol to the ion.
    _________________________________
    _________________________________
    _________________________________
THE PERIODIC TABLE

Tick (✓) the correct answer

1. Which of the following represents a Dobereiner's triad?

2. Elements A, B and C form a Dobereiner's triad. If the atomic mass of element A is 40 and that of element C is 137, then what will be the atomic mass of element B?
   a. 78  b. 98  c. 88.3  d. none of these

3. The scientists who contributed mainly towards the development of the periodic table are:
   a. [i]  b. [i], [ii] [iv]  c. [i], [iii], [iv]  d. [i], [iv]

4. In the Mendeleev periodic table, the properties of an element are a periodic function of their
   a. atomic size  b. ionization energy  c. atomic mass  d. atomic number

5. The number of groups and periods respectively present in a Modern Periodic Table are
   a. 8, 6  b. 18, 7  c. 7, 18  d. 18, 6

6. Which one of the following pairs of elements belong to the same periods of the periodic table?
   a. Na, K  b. Na, Ca  c. Na, Al  d. Mg, Zn

7. The highly metallic element will have a configuration of
   a. 2, 8, 6  b. 2, 8, 8, 6  c. 2, 8, 8, 2  d. 8, 8, 1

8. Among O, C, F, Cl the correct order of increasing radii is:

9. Here some statements are given to Mendeleev and his periodic table. Find the set of correct statements:
   [i] Mendeleev was a Russian chemist  
   [ii] When Mendeleev started his work, 63 elements were known  
   [iii] The properties of elements are periodic functions of their atomic numbers  
   [iv] Vertical columns are called groups and rows are called periods
   a. [i], [iv]  b. [i], [ii] [iv]  c. [i], [ii] [iii], [iv]  d. [ii] [iii], [iv]

10. Which one of the following properties decreases across a period?
   a. [i], [ii]  b. [i], [ii]  c. [i], [ii] [iii]  d. [i], [ii] [iii], [iv]

Fill in the blanks:

11. If an element has low ionization energy then it is likely to be. ………………………………. (metallic/non-metallic)

12. If an element has seven electrons in its outermost shell then it is likely to have the ………………………. (largest/ smallest) atomic size among all the elements in the same period

13. On moving from left to right in a given period, the number of shells ……………………………………………… 
   (remains the same/increases/decreases)

14. Match the following:

<table>
<thead>
<tr>
<th>Column I</th>
<th>Column II</th>
</tr>
</thead>
<tbody>
<tr>
<td>[i] Argon</td>
<td>(a) Alkali metal</td>
</tr>
<tr>
<td>[ii] Chlorine</td>
<td>(b) Alkaline earth metal</td>
</tr>
<tr>
<td>[iii] Calcium</td>
<td>(c) Halogen</td>
</tr>
<tr>
<td>[iv] Sodium</td>
<td>(d) Inert gas</td>
</tr>
</tbody>
</table>

Answer the following questions in one or two words:

15. In a group where do you expect to find an element with the maximum size?

16. Which group of elements was missing from Mendeleev's Periodic Table?

17. The metals of Group 2 from top to bottom are: Be, Mg, Ca, Sr, Ba. Which of these metals will form ions most readily?
STUDY OF THE FIRST ELEMENT - HYDROGEN

Tick (✓) the correct answer

1. The ionisation of the hydrogen atom gives
   (a) Hydride ion (b) Hydronium ion (c) Proton (d) Hydroxyl ion

2. Hydrogen is not obtained when zinc reacts with
   (a) Cold water (b) Dilute H₂SO₄ (c) Dilute HCl (d) Hot 20% NaOH

3. The radioactive isotope of hydrogen is
   (a) Para hydrogen (b) Protium (c) Tritium (d) Deuterium

4. Among the following metals, the one that does not liberate H₂ from dilute H₂SO₄ is
   (a) Na (b) Mg (c) Zn (d) Cu

5. Reactions between the following pairs will produce hydrogen except
   (a) Cu + HCl (b) Fe + H₂SO₄ (c) Mg + steam (d) Na + Alcohol

6. The most dangerous method of preparing hydrogen would be the action of HCl on
   (a) Al (b) Fe (c) K (d) Zn

7. Which one of the following metals reacts with H₂O at room temperature to give hydrogen gas?
   (a) Al (b) Ag (c) Fe (d) Na

8. Haber’s process is used for making
   (a) H₂ (b) NH₃ (c) N₂ (d) CO₂H₂

9. Rocket fuel is
   (a) Liquid O₂ (b) Liquid H₂ (c) N₂ (d) O₃

10. In an aqueous solution, H₂ will not reduce
    (a) Fe²⁺ (b) Cu²⁺ (c) Zn²⁺ (d) Ag⁺

11. Lane’s process is used for the manufacture of

12. Hydrogen has......isotopes and......isomers

13. Heavy hydrogen has........neutron and ......proton in its nucleus

State whether the following statements are True or False:

14. [i] Hydrogen gas is liberated by the action of aluminium with a concentrated solution of sodium hydroxide
    [ii] Deuterium is β emitter
    [iii] Bosch’s process is used for the manufacture of ammonia

Answer the following questions in one or two words:

15. Write the name of an equivolume mixture of carbon monoxide and hydrogen__________________________

16. Name a metal which reacts both with acids and alkalis to displace hydrogen__________________________

17. Name a gas and catalyst used for hydrogenation of oils__________________________

18. In a laboratory, hydrogen gas is not prepared by the reaction of lead with dilute sulphuric acid. Give reasons.

(To be continued on page 31)
ATMOSPHERIC POLLUTION

Tick (√) the correct answer

1. Which one of the following prevents harmful UV radiation of the Sun to reach the earth?
   (a) CO₂ (b) NO₂ (c) ClONO₂ (d) O₃

2. Which one of the following causes the formation of ozone holes in the stratosphere?
   (a) UV radiation of the Sun (b) Use of CFC compounds (c) Excessive use of detergents (d) Use of polychlorinated biphenyls

3. What is the cause of the formation of oxides of sulphur?
   (a) Copper pyrites (b) Gasoline (c) Coal (d) All of the above

4. Which one of the following causes photochemical smog?
   (a) Oxides of nitrogen (b) Oxides of sulphur (c) CO (d) All of the above

5. Which of the following causes a green house effect?
   (a) CH₄ (b) CO₂ (c) SO₂ (d) Both (a) and (b)

6. The following pollutant is not contained in vehicular exhaust emissions
   (a) Lead (b) Ammonia (c) Carbon monoxide (d) Particulate matter

7. The Bhopal gas tragedy struck in the year 1984 due to leakage of the following gas
   (a) Methyl-isocyanate (b) Nitrous oxide (c) Methane (d) Carbon monoxide

8. Health problems related to air pollution include
   (a) Coughing (b) Asthma (c) Bronchitis (d) All of these

9. Inhalation of which one of the following over a long time, causes a disease called pneumococcosis?
   (a) Carbon monoxide (b) Particulates (c) Carbon dioxide (d) Dry air

10. The use of chemistry without pollution refers to which one of the following?
    (a) Industrial chemistry (b) Green chemistry (c) White chemistry (d) Biochemistry

11. Match the following as per their correlative property:

<table>
<thead>
<tr>
<th>Column I</th>
<th>Column II</th>
</tr>
</thead>
<tbody>
<tr>
<td>[i] CO</td>
<td>(a) Peroxyacetyl nitrate</td>
</tr>
<tr>
<td>[ii] O₃</td>
<td>(b) Freons</td>
</tr>
<tr>
<td>[iii] CFC</td>
<td>(c) Stratosphere</td>
</tr>
<tr>
<td>[iv] PAN</td>
<td>(d) Carboxyhaemoglobin</td>
</tr>
</tbody>
</table>

Fill in the blanks:

12. Chlorine nitrate formed in the stratosphere is called --------- -- for ClO• and Cl•.

13. Formation of a polar vortex over the Antarctic region occurs during---------.

14. Conversion of primary pollutants like SO₂ and NO₂ to secondary pollutants in the presence of atmospheric water leads to -------

Answer the following questions in one or two words:

15. What is summer smog also known as? ________________

16. Write the name of a secondary pollutant ________________

17. Which human system is directly affected the most by air pollution? ________________
TRIGONOMETRY-TRIGONOMETRIC RATIOS

Tick (✓) the correct answer

1. Which of the following is NOT a trigonometric identity?
   a. \( \sin^2 \theta + \cos^2 \theta = 1 \)
   b. \( \tan^2 \theta + 1 = \sec^2 \theta \)
   c. \( \cosec^2 \theta - \cot^2 \theta = 1 \)
   d. \( \cot^2 \theta - \cosec^2 \theta = 1 \)

2. The value of the identity \( \frac{\sin A}{1 + \cos A} + \frac{1 + \cos A}{\sin A} \) is equal to
   a. \( 2 \sin A \)
   b. \( \sin A \)
   c. \( 2 \cosec A \)
   d. \( \cosec A \)

3. If A, B and C are interior angles of \( \Delta ABC \), the \( \frac{A + B}{2} \) is equal to
   a. \( \cos \left[ \frac{C}{2} \right] \)
   b. \( \sin \left[ \frac{C}{2} \right] \)
   c. \( \tan \left[ \frac{C}{2} \right] \)
   d. \( \cot \left[ \frac{C}{2} \right] \)

4. The value of \( 12 \sin^2 60° + 8 \cos^2 30° - 5 \cot^2 45° \) is
   a. \( 10 \)
   b. \( 15 \)
   c. \( 0 \)
   d. \( 9 \)

5. If \( \cosec \theta = 5x \) and \( \cot \theta = \frac{5}{x} \), the value of \( x^2 - \frac{1}{x^2} \) is
   a. \( 5 \)
   b. \( \frac{1}{5} \)
   c. \( 25 \)
   d. \( \frac{1}{25} \)

6. If \( \cosec (4A) = \sec (A - 20°) \), where \( 4A \) is an acute angle, the value of \( A \) is
   a. \( 88° \)
   b. \( 44° \)
   c. \( 11° \)
   d. none of these

7. The value of \( \sin 23° \cos 67° + \cos 23° \sin 67° \) is
   a. \( 0 \)
   b. \( 1 \)
   c. \( -1 \)
   d. none of these

8. The value of \( \cosec 40° \cos 50° + \sin 42° \sec 48° \) is
   a. \( 2 \)
   b. \( 1 \)
   c. \( 0 \)
   d. \( -1 \)

9. The value of \( \tan^2 A - \sec 2A \) is
   a. \( 1 \)
   b. \( 0 \)
   c. \( -1 \)
   d. \( 2 \)

10. The value of \( (\cosec 53° + \cot 57°) \), expressed in terms of trigonometric ratios of angles between 0° and 45°, is
    a. \( \cos 37° + \tan 33° \)
    b. \( \sin 37° + \cos 33° \)
    c. \( \sec 33° + \tan 37° \)
    d. \( \sec 37° + \tan 33° \)

11. If \( \frac{\sin x}{13} = \frac{12}{15} \) and \( \cos y = \frac{3}{5} \), the value of \( \cot x + \cosec y \) is
    a. \( \frac{6}{7} \)
    b. \( \frac{56}{15} \)
    c. \( \frac{7}{6} \)
    d. \( \frac{15}{56} \)

12. The value of \( \frac{\cosec 17°}{\sec 73°} + \cot 68° - (\sin^2 44° + \sin^2 46°) \) is:
    a. \( 3 \)
    b. \( 2 \)
    c. \( 1 \)
    d. \( 0 \)

13. The value of the identity \( \frac{\sec \alpha - 1}{\sec \alpha + 1} \) is
    a. \( \frac{1 + \cos \alpha}{1 - \cos \alpha} \)
    b. \( \frac{1 - \cos \alpha}{1 + \cos \alpha} \)
    c. \( \frac{1 + \cos \alpha}{1 + \cos \alpha} \)
    d. \( \frac{1 - \cos \alpha}{1 - \cos \alpha} \)

14. The value of the identity \( \frac{1}{1 + \tan^2 \theta} + \frac{1}{1 + \cot^2 \theta} \) is
    a. \( 0 \)
    b. \( 2 \)
    c. \( -1 \)
    d. \( 1 \)

Fill in the blanks with the correct option.

15. The value of \( \frac{\sin \theta \sin(90° - \theta)}{\cot(90° - \theta)} \) is \( \frac{(\cos 2\theta)}{(\sin 2\theta)} \).

16. The value of \( \tan 10° \tan 20° \tan 60° \tan 70° \tan 80° \) is \( \frac{1}{3} \).

17. As \( \theta \) increases from 0° to 90°, the value of \( \cos \theta \) \( \) decreases \( \) from 1 to 0.

18. The value of \( \sin^2 A \) is equal to \( \frac{1 - \cos^2 A}{1 + \cos^2 A} \).

19. If \( \cos^2 \theta = \frac{1}{2} \), the value of \( \theta \) is equal to \( \frac{30°}{60°} \).

20. The value of \( \tan(40° + \theta) - \cot(50° - \theta) \) is equal to \( 0/1 \).
TRIGONOMETRY–HEIGHTS AND DISTANCES

Tick (✓) the correct answer

1. When a student looks down at an object on the ground, the line drawn from his eye to the object is called
   a. Parallel line  c. Line of sight
   b. Perpendicular line  d. None of these

2. When a student looks up at the top of a tree, the angle formed by the line of sight with the horizontal line through his eye is called
   a. Angle of depression  c. Right angle
   b. Angle of elevation  d. Obtuse angle

3. The height of an object or distance between two objects can be measured with the help of
   a. Trigonometric ratios  b. Basic proportionality theorem
   c. AA similarity criterion  d. None of these

4. The angle formed by the line of sight with the horizontal line through his eye, when a person is standing on a mountain and looking at the road below is called
   a. Angle of elevation  c. Angle of depression
   b. Right angle  d. None of these

5. When an electric pole and its shadow are of the same length, the angle of elevation from a point P is
   a. 30°  c. 60°
   b. 45°  d. All of these

6. A tree is struck by lightning and as it falls, its top makes an angle of 45° with the ground. If the height of the point where the tree is broken is 12m, the whole height of the tree is
   a. $12\sqrt{3}$ m  c. $12(\sqrt{3} + 1)$ m
   b. $12\sqrt{2}$ m  d. $12(\sqrt{2} + 1)$ m

7. Two poles of equal height are 100 m apart. A point P on the road joining the two poles makes an angle of 30° with the top of the first pole and 60° with the top of the second pole. The distance of point P from the first pole is
   a. 50 m  c. 25 m
   b. 75 m  d. 30 m

8. Two men on the same side of a building measure the angles of elevation of the top of the building as 30° and 45°. If the men are 30 m apart, the height of the building is
   a. $15(\sqrt{3} + 1)$ m  c. $10(\sqrt{3} + 1)$ m
   b. $15(\sqrt{3} - 1)$ m  d. None of these

9. A man who is 1.8 m tall finds the angle of elevation of the top of a pillar as 60° and the angle of depression of the base of the pillar as 30°. The height of the pillar is
   a. 5.4 m  c. 6 m
   b. 7.2 m  d. 1.8 m

10. From the top of a lighthouse, a man observes the angles of depression of two ships sailing towards the lighthouse from opposite directions as 30° and 45°. If the ships are 1 km apart, the height of the lighthouse is
    a. $1000\sqrt{3}$ m  c. $500(\sqrt{3} - 1)$ m
    b. 500 m  d. $150\sqrt{3}$ m

11. From the top of a tower 60 m high, the angles of depression of the top and bottom of a pole are 30° and 60° respectively. The height of the pole is
    a. 20 m  c. 40 m
    b. 30 m  d. 50 m

Complete the following as directed.

A bird is sitting on the top of a tree, which is $150\sqrt{3}$ m high. The angle of elevation of the bird from a point A on the ground is 60°. The bird flies away horizontally at a constant height. After 10 seconds, the angle of elevation at the point A becomes 30°. Refer to the figure given below and answer questions 12 to 16.

![Diagram](image_url)

12. $AB =$ …………………………….
13. $AC =$ …………………………… ..
14. $BC =$ ……………………………..
15. Speed of bird = ……………………m/sec
16. Speed of bird = …………………….km/hr

Q17-20. A person standing on the bank of a river observes that the angle of elevation of the top of a tree on the opposite bank is 60°. He moves 80 m away from the bank and now observes the angle of elevation to be 30°. Refer to the figure given below and answer questions 17 to 20.

![Diagram](image_url)

17. $\angle ACD =$ …………………………….
18. $\angle ABD =$ ……………………………..
19. Width of the river = ……………………………
20. Height of the tree = …………………………….

MAX MARKS: 20

WORKSHEET
STATISTICS

Tick (✓) the correct answer

1. Consider the following frequency distribution:

<table>
<thead>
<tr>
<th>Class Interval</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 – 6</td>
<td>6</td>
</tr>
<tr>
<td>6 – 12</td>
<td>8</td>
</tr>
<tr>
<td>12 – 18</td>
<td>10</td>
</tr>
<tr>
<td>18 – 24</td>
<td>p</td>
</tr>
<tr>
<td>24 – 30</td>
<td>7</td>
</tr>
</tbody>
</table>

If the mean is 15.45, the value of p is
a. 10          b. 9          c. 8          d. 21

2. The coordinates of a point P on the cumulative frequency curve for 90 workers in a factory is (70, 45). The median of the data is
a. 45          b. 55          c. 70          d. None of these

3. The marks of 20 students in a test are as follows: 15, 16, 18, 19, 20, 21, 21, 22, 23, 23, 24, 25, 25, 25, 26, 26, 28, 29, 30. The median of the data is
a. 24          b. 25          c. 23          d. 23.5

4. Using the data given in Q 3., the mode of the data is
a. 23          b. 24          c. 5          d. 26

5. Consider the following distribution:

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Number of teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>26 – 30</td>
<td>43</td>
</tr>
<tr>
<td>31 – 35</td>
<td>51</td>
</tr>
<tr>
<td>36 – 40</td>
<td>49</td>
</tr>
<tr>
<td>41 – 45</td>
<td>27</td>
</tr>
<tr>
<td>46 – 50</td>
<td>6</td>
</tr>
<tr>
<td>51 – 55</td>
<td>4</td>
</tr>
</tbody>
</table>

How many teachers are of the age less than 41 years?

a. 94          b. 143         c. 170         d. 176

6. The median from the following ogive is

a. 50          b. 25          c. 79          d. 80

7. The mean of the first five prime numbers is
a. 7          b. 6          c. 5          d. 5.6

8. The class –size (h) =
9. The formula for computing Mean =

Hence, Mean =

10. Hence, Mean =

Complete the following frequency distribution table and answer the question given below.

<table>
<thead>
<tr>
<th>Class Interval</th>
<th>Frequency (fi)</th>
<th>Class – marks (xi)</th>
<th>ui</th>
<th>fi ui</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 – 15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 – 25</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25 – 35</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35 – 45</td>
<td>23</td>
<td>A = 40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>45 – 55</td>
<td></td>
<td></td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>55 – 65</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>80</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8. The class –size (h) =

9. The formula for computing Mean =

Hence, Mean =

10. Hence, Mean =

Complete the following frequency distribution table and answer the question given below.

<table>
<thead>
<tr>
<th>Marks</th>
<th>Number of students</th>
<th>Cumulative Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>56</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>64</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>68</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>72</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>76</td>
<td>18</td>
<td></td>
</tr>
</tbody>
</table>

11. Hence, Median =

The following histogram represents the scores of 50 students of a class. The mode estimated is

12. Mode =

The following cumulative frequency curve shows the ages of 32 factory workers. From the graph answer the questions given below.

13. Lower Quartile =
14. Upper Quartile =
15. Median =
16. Interquartile Range =

11. Hence, Median =

The following histogram represents the scores of 50 students of a class. The mode estimated is

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The following cumulative frequency curve shows the ages of 32 factory workers. From the graph answer the questions given below.

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14. Upper Quartile =
15. Median =
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Answer the following as directed.

Complete the following table to compute the mean of the following distribution by Step Deviation Method.

Class-
Interval | Frequency (fi) | Class – marks (xi) | ui | fi ui |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>5 – 15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 – 25</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>25 – 35</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35 – 45</td>
<td>23</td>
<td>A = 40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>45 – 55</td>
<td></td>
<td></td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>55 – 65</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>80</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8. The class –size (h) =
9. The formula for computing Mean =

Hence, Mean =

10. Hence, Mean =

Complete the following frequency distribution table and answer the question given below.

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<thead>
<tr>
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<td></td>
<td></td>
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<tr>
<td>15 – 25</td>
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<td></td>
<td></td>
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<td></td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>55 – 65</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>80</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>60</td>
<td>10</td>
<td></td>
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<tr>
<td>64</td>
<td>12</td>
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<tr>
<td>68</td>
<td>22</td>
<td></td>
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<tr>
<td>72</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>76</td>
<td>18</td>
<td></td>
</tr>
</tbody>
</table>

11. Hence, Median =

The following histogram represents the scores of 50 students of a class. The mode estimated is

12. Mode =

The following cumulative frequency curve shows the ages of 32 factory workers. From the graph answer the questions given below.

13. Lower Quartile =
14. Upper Quartile =
15. Median =
16. Interquartile Range =

Answer the following as directed.

Complete the following table to compute the mean of the following distribution by Step Deviation Method.

Class-
Interval | Frequency (fi) | Class – marks (xi) | ui | fi ui |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>5 – 15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 – 25</td>
<td></td>
<td></td>
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<tr>
<td>25 – 35</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>35 – 45</td>
<td>23</td>
<td>A = 40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>45 – 55</td>
<td></td>
<td></td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>55 – 65</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>80</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8. The class –size (h) =
9. The formula for computing Mean =

Hence, Mean =

10. Hence, Mean =

Complete the following frequency distribution table and answer the question given below.

<table>
<thead>
<tr>
<th>Marks</th>
<th>Number of students</th>
<th>Cumulative Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>56</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>64</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>68</td>
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<td></td>
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14. Upper Quartile =
15. Median =
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PROBABILITY

Tick (✓) the correct answer

1. The probability of an event cannot be
   a. 0               c. 0.5
   b. 1               d. −0.5

2. If P(E) is the probability of an event E, which of the following is correct?
   a. P(E) > 1       c. 0 ≤ P(E) ≤ 1
   b. P(E) < 0       d. 0 < P(E) < 1

3. A bag contains 5 red balls, 6 white balls and 9 black balls. A ball is drawn at random from the bag. The probability that the ball drawn is yellow is
   a. $\frac{1}{4}$               c. $\frac{9}{20}$
   b. $\frac{3}{10}$               d. None of these

4. From the same bag used in Q 3., the probability that the ball drawn is ‘Not white’ is
   a. $\frac{3}{10}$               c. $\frac{1}{2}$
   b. $\frac{7}{10}$               d. $\frac{9}{20}$

5. Two coins are tossed simultaneously. The probability of getting exactly ‘one tail’ is
   a. $\frac{1}{2}$               c. $\frac{3}{4}$
   b. $\frac{1}{4}$               d. one of these

6. Two coins are tossed simultaneously. The probability of getting ‘at least one head’ is
   a. $\frac{1}{2}$               c. $\frac{3}{4}$
   b. $\frac{1}{4}$               d. None of these

7. A card is drawn at random from a pack of 52 playing cards. The probability that the card is neither a king nor a queen is
   a. $\frac{2}{13}$               c. $\frac{1}{13}$
   b. $\frac{11}{13}$               d. $\frac{12}{13}$

8. A die is thrown once. The probability of getting an ‘odd prime number’ is
   a. $\frac{1}{2}$               c. $\frac{1}{6}$
   b. $\frac{2}{3}$               d. $\frac{1}{3}$

9. Cards marked with numbers 6, 7, 8, ……., 35 are placed in a box and mixed thoroughly. One card is drawn at random. The probability that the card drawn is ‘divisible by 5’ is
   a. $\frac{1}{5}$               c. $\frac{2}{15}$
   b. $\frac{7}{30}$               d. $\frac{1}{6}$

10. Using the same box given in Q 9., the probability that the card drawn is ‘an even number’ is
    a. $\frac{1}{2}$               c. $\frac{1}{2}$
    b. $\frac{1}{3}$               d. $\frac{2}{3}$

Fill in the blanks with the correct option.

11. When a die is thrown once, getting the number 9 is a/an………………..(sure event / impossible event).

12. Ravi and Shankar are playing a badminton match. The probability of Ravi winning is 0.59. The probability of Shankar winning is…………………..(0.41 / 0.59).

13. Two dice are tossed simultaneously. The total number of possible outcomes is ……………… (30 / 36).

14. On rolling a die, the event of getting a number p such that $1 \leq p \leq 6$, is a/an………………….. (sure event / impossible event).

15. The probability of getting 53 Saturdays in a non-leap year is………………….. $\left[\frac{1}{7}\right].$

16. A bag has 12 blue balls and x red balls. When a ball is drawn randomly, the probability of getting a red ball is $\frac{2}{5}$. The number of red balls is ………………..( 10 / 8)

State whether the following statements are True or False.

17. On tossing a coin, getting a head or a tail is an equally likely event.

18. A coin is tossed three times. The probability of getting three heads is $\frac{1}{8}$.

19. $P(E) + P(\bar{E}) = 1$

20. The probability of drawing a red card from a pack of 52 playing cards is $\frac{1}{2}$. 