NEET-UG EXAMINATION PAPER-2015

(Solved)

Time allowed : 3 hours | Maximum Marks : 540

General Instructions :

Read the following instructions carefully and follow them :

i. This question paper contains **135 questions.** All questions are **compulsory.**

ii. This question paper is divided into **1 sections.**

iii. **Section A** – questions number **1 to 135** are multiple choice questions

iv. There is no overall choice given in the question paper. However, an internal choice has been provided in few questions.

v. Use of calculator is NOT allowed.

Section A

Question 1.

Pick up the wrong statement

[4 Marks]

(A) Protista have photosynthetic and heterotrophic modes of nutrition

(B) Some fungi are edible

(C) Nuclear membrane is present in Monera

(D) Cell wall is absent in Animalia

Question 2.

Which of the following structures is not found in a prokaryotic cell?

[4 Marks]

(A) Ribosome

(B) Mesosome

(C) Nuclear envelope

(D) Plasma membrane

Question 3.

The structures that help some bacteria to attach to rocks and / or host tissues are:

[4 Marks]

(A) Fimbriae

(B) Mesosomes

(C) Holdfast

(D) Rhizoids

Question 4.

In which group of organisms the cell walls form two thin overlapping shells which fit together?

[4 Marks]

(A) Euglenoids

(B) Slime moulds

(C) Chrysophytes

(D) Dinoflagellates

Question 5.

Which one one of the following matches is correct ?

[4 Marks]

(a)	*Alternaria*	Sexual reproduction absent	Deuteromycetes
(b)	*Mucor*	Reproduction by Conjugation	Ascomycetes
(c)	*Agaricus*	Parasitic fungus	Basidiomycetes
(d)	*Phytophthora*	Aseptate mycelium	Basidiomycetes

(A) A

(B) B

(C) C

(D) D

Question 6.

True nucleus is absent in :

[4 Marks]

(A) Mucor

(B) Vaucheria

(C) Volvox

(D) Anabaena

Question 7.

The imperfect fungi which are decomposers of litter and help in mineral cycling belong to:

[4 Marks]

(A) Deuteromycetes

(B) Ascomycetes

(C) Basidiomycetes

(D) Phycomycetes

Question 8.

Choose the wrong statements:

[4 Marks]

(A) Morels and truffles are poisonoues mushrooms

(B) Neurospora is used in the study of biochemical genetics

(C) Yeast is unicellular and useful in fermentation

(D) Penicillium is multicellular and produces antibiotics

Question 9.

Which of the following are most suitable indicators of SO_2 pollution in the environment?

[4 Marks]

(A) Algae

(B) Conifers

(C) Fungi

(D) Lichens

Question 10.

Male gametes are flagellated in:

[4 Marks]

(A) Spirogyra

(B) Polysiphonia

(C) Ectocarpus

(D) Anabaena

Question 11.

Which one of the following statements is wrong?

[4 Marks]

(A) Agar - agar is obtained from Gelidium and Gracilaria

(B) Chlorella and Spirulina are used as space food

(C) Mannitol is stored food in Rhodophyceae

(D) Algin and carragen are products of algae

Question 12.

Which one is wrong statement ?

[4 Marks]

(A) Brown algae have chlorophyll a and c and fucoxanthin

(B) Haploid endosperm is typical feature of gymnosperms

(C) Archegonia are found in Bryophyta, Pteridophyta and Gymnosperms.

(D) Mucor has biflagellate zoospores

Question 13.

In which of the following gametophyte is not independent free living ?

[4 Marks]

(A) Pinus

(B) Funaria

(C) Pteris

(D) Marchantia

Question 14.

Read the following five statements (A to E) and select the option with all correct statements:

(A) Mosses and Lichens are the first organisms to colonise a bare rock.

(B) *Selaginella* is a homosporous pteridophyte.

(C) Coralloid roots in *Cycas* have VAM.

(D) Main plant body in bryophytes is gametophytic, whereas in pteridophytes it is sporophytic.

(E) In gymnosperms, male and female gametophytes are present within sporangia located on sporophyte.

[4 Marks]

(A) (A), (C) and (D)

(B) (B), (C) and (E)

(C) (A), (D) and (E)

(D) (B), (C) and (D)

Question 15.

Male gametophyte in angiosperms produces:

[4 Marks]

(A) Single sperm and vegetative cell

(B) Single sperm and vegetative cell

(C) Three sperms

(D) Two sperms and a vegetative cell

Question 16.

In angiosperms, microsporogenesis and megasporogenesis:

[4 Marks]

(A) form gametes without further divisions

(B) involve meiosis

(C) occur in ovule

(D) occur in anther

Question 17.

Which of the following characteristics is mainly responsible for diversification of insects on land?

[4 Marks]

(A) Bilateral symmetry

(B) Exoskeleton

(C) Segmentation

(D) Eyes

Question 18.

Metagenesis refers to:

[4 Marks]

(A) Alteration of generation between asexual and sexual phases of an organisms

(B) resence of a segmented body and parthenogenetic mode of reproduction

(C) Presence of different morphic forms

(D) Presence of a segmented body and parthenogenetic mode of reproduction

Question 19.

Body having meshwork of cell, internal cavities lined with food filtering flagellated cells and indirect develpment are the characteristics of phylum.

[4 Marks]

(A) Porifera

(B) Mollusca

(C) Protozoa

(D) Coelenterate

Question 20.

A jawless fish, which lays eggs in fresh water and whose ammocoetes larvae after metamorphosis return to the ocean is:

[4 Marks]

(A) Petromyzon

(B) Eptatretus

(C) Neomyxine

(D) Myxine

Question 21.

Which of the following animals is not viviparous?

[4 Marks]

(A) Elephant

(B) Platypus

(C) Whale

(D) Flying fox (Bat)

Question 22.

Which of the following represents the correct combination without any exception?

[4 Marks]

	Characteristics	Class
(a)	Mouth ventral, gills without operculum; skin with placoid scales; persistent notochord	Chondrichthyes
(b)	Sucking and circular mouth; jaws absent, integument without scales; paired appendages	Cyclostomata
(c)	Body covered with feathers; skin moist and glandular; fore-limbs form wings; lungs with air sacs	Aves
(d)	Mammary gland; hair on body; pinnae; two pairs of Limbs	Mammalia

(A) a

(B) b

(C) c

(D) d

Question 23.

Leaves become modified into spines in:

[4 Marks]

(A) Opuntia

(B) Pea

(C) Silk Cotton

(D) Onion

Question 24.

Perigynous flowers are found in:

[4 Marks]

(A) Guava

(B) Rose

(C) China rose

(D) Cucumber

Question 25.

Axile placentation is present in:

[4 Marks]

(A) Dianthus

(B) Argemone

(C) Pea

(D) Lemon

Question 26.

Coconut water from a tender coconut is:

[4 Marks]

(A) Free nuclear endosperm

(B) Innermost layers of the seed coat

(C) Degenerated nucellus

(D) Immature embryo

Question 27.

Which one of the following fruits is parthenocarpic ?

[4 Marks]

(A) Jackfruit

(B) Apple

(C) Banana

(D) Brinjal

Question 28.

The wheat grain has an embryo with one, large, shield-shaped cotyledon known as:

[4 Marks]

(A) Coleorrhiza

(B) Scutellum

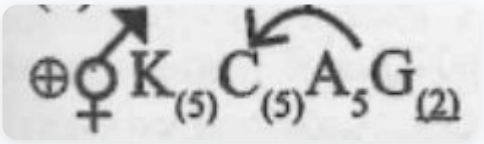
(C) Coleoptile

(D) Epiblast

Question 29.

is the floral formula of:

[4 Marks]



(A) Allium

(B) Sesbania

(C) Petunia

(D) Brassica

Question 30.

Keel is the characteristic feature of flower of:

[4 Marks]

(A) Tomato

(B) Tulip

(C) Indigofera

(D) Aloe

Question 31.

Among china rose, mustard, brinjal, potato, guava, cucumber, onion and tulip, how many plants have superior ovary?

[4 Marks]

(A) Three

(B) Six

(C) Four

(D) Five

Question 32.

Flowers are unisexual in:

[4 Marks]

(A) Cucumber

(B) China rose

(C) Onion

(D) Pea

Question 33.

Transmission tissue is characteristic feature of:

[4 Marks]

(A) Solid style

(B) Dry stigma

(C) Wet stigma

(D) Hollow style

Question 34.

In a ring girdled plant:

[4 Marks]

(A) The root dies first

(B) The shoot and root die together

(C) Neither root nor shoot will die

(D) The shoot dies first

Question 35.

A major characteristic of the monocot root is the presence of:

[4 Marks]

(A) Open vascular bundles

(B) Cambium sandwiched between phloem and xylem along the radius

(C) Vasculature without cambium

(D) Scattered vascular bundles

Question 36.

Vascular bundles in monocotyledons are considered closed because:

[4 Marks]

(A) A bundle sheath surrounds each bundle

(B) Xylem is surrounded all around by phloem

(C) There are no vessels with perforations

(D) Cambium is absent

Question 37.

Read the different components from (a) to (d) in the list given below and tell the correct order of the components with reference to their arrangement from outer side to inner side in a woody dicot stem.

(A) Secondary cortex
(B) Wood

(C) Secondary phloem
(D) Phellem

The correct order is:

[4 Marks]

(A) (D), (C), (A), (B)

(B) (C), (D), (B), (A)

(C) (A), (B), (D), (C)

(D) (D), (A), (C), (B)

Question 38.

The body cells in cockroach discharge their nitrogenous waste in the haemolymph mainly in the form of:

[4 Marks]

(A) Potassium urate

(B) Urea

(C) Calcium carbonate

(D) Ammonia

Question 39.

The terga, sterna and pleura of cockroach body are joined by:

[4 Marks]

(A) Muscular tissue

(B) Arthrodial membrane

(C) Cartilage

(D) Cementing glue

Question 40.

Identify the correct order of organisation of genetic material from largest to smallest:

[4 Marks]

(A) Genome, chromosome, nucleotide, gene

(B) Genome, chromosome, gene, nucleotide

(C) Chromosome, genome, nucleotide, gene

(D) Chromosome, gene, genome, nucleotide

Question 41.

A protoplast is a cell:

[4 Marks]

(A) without nucleus

(B) without cell wall

(C) without plasma membrane

(D) undergoing division

Question 42.

Which one of the following is not an inclusion body found in prokaryotes?

[4 Marks]

(A) Cyanophycean granule

(B) Glycogen granule

(C) Phosphate granule

(D) Polysome

Question 43.

Cell wall is absent in:

[4 Marks]

(A) Funaria

(B) Nostoc

(C) Mycoplasma

(D) Aspergillus

Question 44.

DNA is not present in:

[4 Marks]

(A) Ribosomes

(B) Nucleus

(C) Mitochondria

(D) Chloroplast

Question 45.

Nuclear envelope is a derivative of:

[4 Marks]

(A) Smooth endoplasmic reticulum

(B) Rough endoplasmic reticulum

(C) Membrane of Golgi complex

(D) Microtubules

Question 46.

Select the correct matching in the following pairs:

[4 Marks]

(A) Smooth ER – Oxidation of phospholipids

(B) Rough ER – Oxidation of fatty acids

(C) Rough ER – Synthesis of glycogen

(D) Smooth ER – Synthesis of lipids

Question 47.

Which of the following are not membrane-bound?

[4 Marks]

(A) Lysosomes

(B) Mesosomes

(C) Ribosomes

(D) Vacuoles

Question 48.

The function of the gap junction is to:

[4 Marks]

(A) stop substance from leaking across a tissue.

(B) facilitate communication between adjoining cells by connecting the cytoplasm for rapid transfer of ions, small molecules and some large molecules.

(C) perform cementing to keep neighbouring cells together.

(D) separate two cells from each other.

Question 49.

Balbiani rings are sites of:

[4 Marks]

(A) Nucleotide synthesis

(B) Polysaccharide synthesis

(C) Lipid synthesis

(D) RNA and protein synthesis

Question 50.

Match the columns and identify the correct option.

[4 Marks]

Column-I		Column-II	
(1)	Thylakoids	(i)	Disc-shaped sacs in Golgi apparatus
(2)	Cristae	(ii)	Condensed structure of DNA
(3)	Cisternae	(iii)	Flat membranous sacs in stroma
(4)	Chromatin	(iv)	Infoldings in mitochondria

	(1)	(2)	(3)	(4)
(a)	(iii)	(iv)	(i)	(ii)
(b)	(iii)	(i)	(iv)	(ii)
(c)	(iii)	(iv)	(ii)	(i)
(d)	(iv)	(iii)	(i)	(ii)

(A) b

(B) a

(C) c

(D) d

Question 51.

Cellular organelles with membranes are:

[4 Marks]

(A) Chromosomes, ribosomes and endoplasmic reticulum

(B) Endoplasmic reticulum, ribosomes and nuclei

(C) Lysosomes, Golgi apparatus and mitochondria

(D) Nuclei, ribosomes and mitochondria

Question 52.

Which one of the following statements is incorrect?

[4 Marks]

(A) In competitive inhibition, the inhibitor molecule is not chemically changed by the enzyme.

(B) The competitive inhibitor does not affect the rate of breakdown of the enzyme-substrate complex.

(C) The presence of the competitive inhibitor decreases the K_m of the enzyme for the substrate. competitive inhibitor does not affect the rate of breakdown of the enzyme-substrate complex.

(D) A competitive inhibitor reacts reversibly with the enzyme to form an enzyme-inhibitor complex.

Question 53.

Which of the following biomolecules does have phosphodiester bond?

[4 Marks]

(A) Monosaccharides in a polysaccharide

(B) Amino acids in a polypeptide

(C) Nucleic acids in a nucleotide

(D) Fatty acids in a diglyceride

Question 54.

The introduction of t-DNA into plants involves:

[4 Marks]

(A) Altering the pH of the soil, then heat shocking the plants

(B) Exposing the plants to cold for a brief period

(C) Allowing the plant roots to stand in water

(D) Infection of the plant by Agrobacterium tumefaciens

Question 55.

A somatic cell that has just completed the S phase of its cell cycle, as compared to a gamete of the same species, has:

[4 Marks]

(A) Four times the number of chromosomes and twice the amount of DNA

(B) Twice the number of chromosomes and twice the amount of DNA

(C) Same number of chromosomes but twice the amount of DNA

(D) Twice the number of chromosomes and four times the amount of DNA

Question 56.

Select the correct option

[4 Marks]

	I		II
A	Synapsis aligns homologous chromosomes	(i)	Anaphase-II
B	Synthesis of RNA and protein	(ii)	Zygotene
C	Action of enzyme recombinase	(iii)	G2-phase
D	Centromeres do not separate but chromatids move towards opposite poles	(iv)	Anaphase-I
		(v)	Pachytene

	A	B	C	D
(a)	(ii)	(iii)	(v)	(iv)
(b)	(i)	(ii)	(v)	(iv)
(c)	(ii)	(iii)	(iv)	(v)
(d)	(ii)	(i)	(iii)	(iv)

(A) a

(B) b

(C) c

(D) d

Question 57.

Choose the correct option for the following events of meiosis in correct sequence:

(A) Crossing over
(B) Synapsis
(C) Terminalisation of chiasmata
(D) Disappearance of nucleolus

[4 Marks]

(A) B → A → C → D

(B) A → B → C → D

(C) A → B → D → C

(D) A → B → D → C

Question 58.

Which one gives the most valid and recent explanation for stomatal movements?

[4 Marks]

(A) Starch hydrolysis

(B) Potassium influx and efflux

(C) Guard cell photosynthesis

(D) Transpiration

Question 59.

A column of water within xylem vessels of tall trees does not break under its weight because of:

[4 Marks]

(A) Tensile strength of water

(B) Lignification of xylem vessels

(C) Positive root pressure

(D) Dissolved sugars in water

Question 60.

Root pressure develops due to:

[4 Marks]

(A) Passive absorption

(B) Low osmotic potential in soil

(C) Increase in transpiration

(D) Active absorption

Question 61.

Roots play insignificant role in absorption of water in :

[4 Marks]

(A) Pea

(B) Pistia

(C) Wheat

(D) Sunflower

Question 62.

Transpiration and root pressure cause water to rise in plants by :

[4 Marks]

(A) Pulling and pushing it, respectively

(B) Pushing it upward

(C) Pushing it upward

(D) Pushing and pulling it, respectively

Question 63.

Minerals known to be required in large amounts for plant growth include :

[4 Marks]

(A) calcium, magnesium, manganese, copper

(B) potassium, phosphorus, selenium, boron

(C) magnesium, sulphur, iron, zinc

(D) phosphorus, potassium, sulphur, calcium

Question 64.

The structures that are formed by stacking of organized flattened membranous sacs in the chloroplasts are :

[4 Marks]

(A) Grana

(B) Stroma lamellae

(C) Soma

(D) Cristae

Question 65.

Chromatophores take part in:

[4 Marks]

(A) Movement

(B) Growth

(C) Respiration

(D) Photosynthesis

Question 66.

Cytochromes are found in :

[4 Marks]

(A) Outer wall of mitochondria

(B) Cristae of mitochondria

(C) Lysosomes

(D) Matrix of mitochondria

Question 67.

The oxygen evolved during photosynthesis comes from water molecules. Which one of the following pairs of elements is involved in this reaction?

[4 Marks]

(A) Manganese and Potassium

(B) Magnesium and Molybdenum

(C) Magnesium and Chlorine

(D) Manganese and Chlorine

Question 68.

In photosynthesis the light-independent reactions take place at :

[4 Marks]

(A) Photosystem-I

(B) Stromal matrix

(C) Photosystem-II

(D) Thylakoid lumen

Question 69.

Typical growth curve in plants is :

[4 Marks]

(A) Linear

(B) Stair-steps shaped

(C) Sigmoid

(D) Parabolic

Question 70.

What causes a green plant exposed to the light on only one side, to bend toward the source of light as it grows ?

[4 Marks]

(A) Green plants seek light because they are phototropic

(B) Light stimulates plant cells on the lighted side to grow faster

(C) Auxin accumulates on the shaded side, stimulating greater cell elongation there.

(D) Auxin accumulates on the shaded side, stimulating greater cell elongation there.

Question 71.

Auxin can be bioassayed by

[4 Marks]

(A) Hydroponics

(B) Potometer

(C) Lettuce hypocotyl elongation

(D) Avena coleoptile curvature

Question 72.

Which of the following statements is not correct?

[4 Marks]

(A) Oxyntic cells are present in the mucosa of stomach and secrete HCL.

(B) Which of the following statements is not correct?

(C) Acini are present in the pancreas and secrete carboxypeptidase

(D) Brunner’s glands are present in the submucosa of stomach and secrete pepsinogen

Question 73.

The primary dentition in human differs from permanent dentition in not having one of the following type of teeth:

[4 Marks]

(A) Canine

(B) Incisors

(C) Molars

(D) Premolars

Question 74.

Gastric juice of infants contains:

[4 Marks]

(A) nuclease, pepsinogen, lipase

(B) pepsinogen, lipase, rennin

(C) maltase, pepsinogen, rennin

(D) amylase, rennin, pepsinogen

Question 75.

When you hold your breath, which of the following gas changes in blood would first lead to the urge to breathe?

[4 Marks]

(A) falling CO_2 concentration

(B) rising CO_2 concentration

(C) rising CO_2 and falling O_2 concentration

(D) falling O_2 concentration

Question 76.

Name the pulmonary disease in which alveolar surface area involved in gas exchange is drastically reduced due to damage in the alveolar walls.

[4 Marks]

(A) Pleurisy

(B) Pneumonia

(C) Emphysema

(D) Pneumonia

Question 77.

Which one of the following is correct?

[4 Marks]

(A) Plasma = Blood – Lymphocytes

(B) Blood = Plasma + RBC + WBC

(C) Lymph = Plasma + RBC + WBC

(D) Serum = Blood + Fibrinogen

Question 78.

Erythropoiesis starts in:

[4 Marks]

(A) Spleen

(B) Liver

(C) Red bone marrow

(D) Kidney

Question 79.

Blood pressure in the mammalian aorta is maximum during:

[4 Marks]

(A) Diastole of the right atrium.

(B) Systole of the left ventricle.

(C) Systole of the left atrium.

(D) Diastole of the right ventricle.

Question 80.

Doctors use stethoscope to hear the sounds produced during each cardiac cycle. The second sound is heard when:

[4 Marks]

(A) Ventricular wall vibrate due to gushing in of blood from atria.

(B) Semilunar valves close down after the blood flows into vessels from ventricles.

(C) AV node receives signal from SA node.

(D) AV valves open up.

Question 81.

'Which one of the following animals has two separate circulatory pathways?

[4 Marks]

(A) Lizard

(B) Whale

(C) Shark

(D) Frog

Question 82.

Which of the following does not favour the formation of large quantities of dilute urine?

[4 Marks]

(A) Atrial-natriuretic factor

(B) Alcohol

(C) Renin

(D) Caffeine

Question 83.

Removal of proximal convoluted tubule from the nephron will result in:

[4 Marks]

(A) More concentrated urine

(B) No change in quality and quantity of urine

(C) No urine formation

(D) More diluted urine

Question 84.

Human urine is usually acidic because :

[4 Marks]

(A) the sodium transporter exchanges one hydrogen ion for each sodium ion, in peritubular capillaries.

(B) hydrogen ions are actively secreted into the filtrate.

(C) potassium and sodium exchange generates acidity

(D) excreted plasma proteins are acidic

Question 85.

Sliding filament theory can be best explained as:

[4 Marks]

(A) Actin and Myosin filaments shorten and slide pass each other

(B) Actin and Myosin filaments do not shorten but rather slide pass each other

(C) When myofilaments slide pass each other Actin filaments shorten while Myosin filament do not. shorten

(D) When myofilaments slide pass each other, Myosin filaments shorten while Actin filaments do not. shorten

Question 86.

Glenoid cavity articulates:

[4 Marks]

(A) Scapula with acromion

(B) Clavicle with scapula

(C) Clavicle with acromion

(D) Humerus with scapula

Question 87.

Which of the following joints would allow no movement?

[4 Marks]

(A) Cartilaginous joint

(B) Synovial joint

(C) Ball and Socket joint

(D) Fibrous joint

Question 88.

Which of the following is **not** a function of the skeletal system?

[4 Marks]

(A) Storage of minerals

(B) Production of body heat

(C) Locomotion

(D) Production of erythrocytes

Question 89.

Which of the following regions of the brain is incorrectly paired with its function?

[4 Marks]

(A) Medulla oblongata – homeostatic control

(B) Cerebrum – calculation and contemplation

(C) Corpus callosum – communication between the left and right cerebral cortices

(D) Cerebellum — language comprehension

Question 90.

Destruction of the anterior horn cell of the spinal cord would result in loss of:

[4 Marks]

(A) Voluntary motor impulses

(B) Commissural impulses

(C) Integrating impulses

(D) Sensory impulses

Question 91.

The number of water molecules is maximum in:

[4 Marks]

(A) 18 molecules of water

(B) 18 moles of water

(C) 18 gram of water

(D) 1.8 gram of water

Question 92.

20.0 g of a magnesium carbonate sample decomposes on heating to give carbon dioxide and 8.0 g magnesium oxide. What will be the percentage purity of magnesium carbonate in the sample?

[4 Marks]

(A) 96

(B) 84

(C) 60

(D) 75

Question 93.

If Avogadro number N_A is changed from 6.022×10^{23} mol^{-1} to 6.022×10^{20} mol^{-1}, this would change:

[4 Marks]

(A) the definition of mass in units of grams

(B) the mass of one mole of carbon

(C) the ratio of elements to each other in a compound

(D) the ratio of chemical species to each other in a balanced equation

Question 94.

What is the mass of precipitate formed when 50 mL of 16.9% solution of $AgNO_3$ is mixed with 50 mL of 5.8% NaCl solution?

(Ag = 107.8, N = 14, O = 16, Na = 23, Cl = 35.5)

[4 Marks]

(A) 28 g

(B) 7 g

(C) 14 g

(D) 3.5 g

Question 95.

The formation of the oxide ion $O^{2-}(g)$, from oxygen atom requires first an exothermic and then an endothermic step as shown below:

$O(g) + e^- \rightarrow O^-(g)$; $\Delta_f H° = -141 kJ\ mol^{-1}$

$O^-(g) + e^- \rightarrow O^{2-}(g)$; $\Delta_f H° = +780\ kJ\ mol^{-1}$

Thus, the process of formation of O^{2-} ion in the gas phase is unfavourable even though O^{2-} is isoelectronic with neon. It is due to the fact that

[4 Marks]

(A) Electron repulsion outweighs the stability gained by achieving noble gas configuration

(B) O^- ion has comparatively smaller size than oxygen atom

(C) Addition of electron in oxygen results in larger size of the ion.

(D) Oxygen is more electronegative

Question 96.

In which of the following pairs, both the species are not isostructural?

[4 Marks]

(A) Diamond, silicon carbide

(B) $SiCl_4$, PCl_4^+

(C) NH_3, PH_3

(D) XeF_4, XeO_4

Question 97.

A gas such as carbon monoxide would be most likely to obey the ideal gas law at:

[4 Marks]

(A) High temperatures and low pressures.

(B) Low temperatures and high pressures.

(C) High temperatures and high pressures.

(D) Low temperatures and low pressures.

Question 98.

The heat of combustion of carbon to CO_2 is **−393.5 kJ/mol**. The heat released upon formation of **35.2 g of CO_2** from carbon and oxygen gas is

[4 Marks]

(A) −31.5 kJ

(B) −315 kJ

(C) −630 kJ

(D) +315 kJ

Question 99.

If the equilibrium constant for

$N_2(g) + O_2(g) \rightleftharpoons 2NO(g)$ is **K**, the equilibrium constant for

$1/2N_2(g) + 1/2O_2(g) \rightleftharpoons NO(g)$ will be:

[4 Marks]

(A) K^2

(B) 1/2K

(C) K

(D) $K^{1/2}$

Question 100.

What is the pH of the resulting solution when equal volumes of 0.1 M NaOH and 0.01 M HCl are mixed?

[4 Marks]

(A) 7.0

(B) 1.04

(C) 12.65

(D) 2.0

Question 101.

Which one of the following pairs of solution is not an acidic buffer?

[4 Marks]

(A) $HClO_4$ and $NaClO_4$

(B) CH_3COOH and CH_3COONa

(C) H_2CO_3 and Na_2CO_3

(D) H_3PO_4 and Na_3PO_4

Question 102.

On heating, which of the following releases CO_2 most easily?

[4 Marks]

(A) $MgCO_3$

(B) $CaCO_3$

(C) K_2CO_3

(D) Na_2CO_3

Question 103.

The stability of +1 oxidation state among Al, Ga, In and Tl increases in the sequence:

[4 Marks]

(A) In < Tl < Ga < Al

(B) Ga < In < Al < Tl

(C) Tl < In < Ga < Al

(D) Al < Ga < In < Tl

Question 104.

Which of the following statements is **not correct** for a nucleophile?

[4 Marks]

(A) Ammonia is a nucleophile.

(B) Nucleophile is a Lewis acid.

(C) Nucleophiles attack on less e^- density sites.

(D) Nucleophiles are not electron seeking.

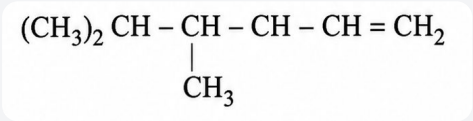
Question 105.

2,3-Dimethyl-2-butene can be prepared by heating which of the following compounds with a strong acid?

[4 Marks]

(A) $(CH_3)_3C-CH=CH_2$

(B)



(C) $(CH_3)_2CH-CH_2-CH=CH2_2$

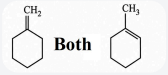
(D) $(CH_3)_2C=CH-CH_2CH_3$

Question 106.

In the reaction with HCl, an alkene reacts in accordance with the Markovnikov's rule, to give a product 1-chloro-1-methylcyclohexane. The possible alkene is:

[4 Marks]

(A)



(B)



(C)



(D)



Question 107.

Aqueous solution of which of the following compounds is the best conductor of electric current?

[4 Marks]

(A) Ammonia, NH_3

(B) Hydrochloric acid, HCl

(C) Acetic acid, $C_2H_4O_2$

(D) Fructose, $C_6H_{12}O_6$

Question 108.

The rate constant of the reaction A → B is 0.6×10^{-3} mol s^{-1}. If the concentration of A is 5 M, then the concentration of B after 20 minutes is:

[4 Marks]

(A) 1.08 M

(B) 3.60 M

(C) 0.36 M

(D) 0.72 M

Question 109.

In the extraction of copper from its sulphide ore, the metal is finally obtained by the reduction of cuprous oxide with:

[4 Marks]

(A) Sulphur dioxide

(B) Carbon monoxide

(C) Iron (II) sulphide

(D) Copper (I) sulphide

Question 110.

Strong reducing behaviour of H_3PO_2 is due to:

[4 Marks]

(A) Presence of two –OH groups and one P–H bond

(B) High oxidation state of phosphorus

(C) High electron gain enthalpy of phosphorus

(D) Presence of one –OH group and two P–H bonds

Question 111.

Which of the statements given below is incorrect?

[4 Marks]

(A) O_3 molecule is bent.

(B) Cl_2O_7 is an anhydride of perchloric acid.

(C) ONF is isoelectronic with O_2N^-.

(D) OF_2 is an oxide of fluorine.

Question 112.

The variation of the boiling point of the hydrogen halides is in the order HF > HI > HBr > HCl. What explains the higher boiling point of hydrogen fluoride?

[4 Marks]

(A) There is strong hydrogen bonding between HF molecules.

(B) The bond energy of HF molecules is greater than in other hydrogen halides.

(C) The electronegativity of fluorine is much higher than for other elements in the group.

(D) The effect of nuclear shielding is much reduced in fluorine which polarises the HF molecule.

Question 113.

Which is the correct order of increasing energy of the listed orbitals in the atom of titanium?

[4 Marks]

(A) 3s 3p 3d 4s

(B) 3s 3p 4s 3d

(C) 3s 4s 3p 3d

(D) 4s 3s 3p 3d

Question 114.

Assuming complete ionization, same moles of which of the following compounds will require the least amount of acidified $KMnO_4$ for complete oxidation?

[4 Marks]

(A) $Fe(NO_2)_2$

(B) FeC_2O_4

(C) $FeSO_3$

(D) $FeSO_4$

Question 115.

Gadolinium belongs to 4f series. Its atomic number is 64. Which of the following is the correct electronic configuration of gadolinium?

[4 Marks]

(A) $[Xe]4f^6 5d^2 6s^2$

(B) $[Xe]4f^7 5d^1 6s^2$

(C) $[Xe]4f^9 5s^1$

(D) $[Xe]4f^8 6d^2$

Question 116.

The sum of coordination number and oxidation number of the metal M in the complex $[M(en)_2(C_2O_4)]Cl$ (where en is ethylenediamine) is:

[4 Marks]

(A) 6

(B) 9

(C) 8

(D) 7

Question 117.

The name of complex ion, $[Fe(CN)_6]^{3-}$ is:

[4 Marks]

(A) Tricyanoferrate (III) ion

(B) Hexacyanitoferrate (III) ion

(C) Hexacyanidoferrate (III) ion

(D) Hexacyanoiron (III) ion

Question 118.

Number of possible isomers for the complex $[Co(en)_2Cl_2]Cl$ will be (en = ethylenediamine):

[4 Marks]

(A) 3

(B) 4

(C) 1

(D) 2

Question 119.

In an S_N1 reaction on chiral centres there is:

[4 Marks]

(A) Inversion more than retention leading to partial racemization

(B) 100% racemization

(C) 100% inversion

(D) 100% retention

Question 120.

Two possible stereo-structures of $CH_3CHOHCOOH$, which are optically active, are called:

[4 Marks]

(A) Mesomers

(B) Atropisomers

(C) Enantiomers

(D) Diastereomers

Question 121.

Which of the following reaction(s) can be used for the preparation of alkyl halides?

(I) $CH_3CH_2OH+HCl \xrightarrow{\text{anh. } ZnCl_2}$

(II) $CH_3CH_2OH+HCl \rightarrow$

(III) $(CH_3)_3COH+HCl \rightarrow$

(IV) $(CH_3)_2CHOH+HCl \xrightarrow{\text{anh. } ZnCl_2}$

[4 Marks]

(A) (IV) only

(B) (I) and (II) only

(C) (III) and (IV) only

(D) (I), (III) and (IV) only

Question 122.

Reaction of phenol with chloroform in presence of dilute sodium hydroxide finally introduces which one of the following functional group?

[4 Marks]

(A) –CHO

(B) –COOH

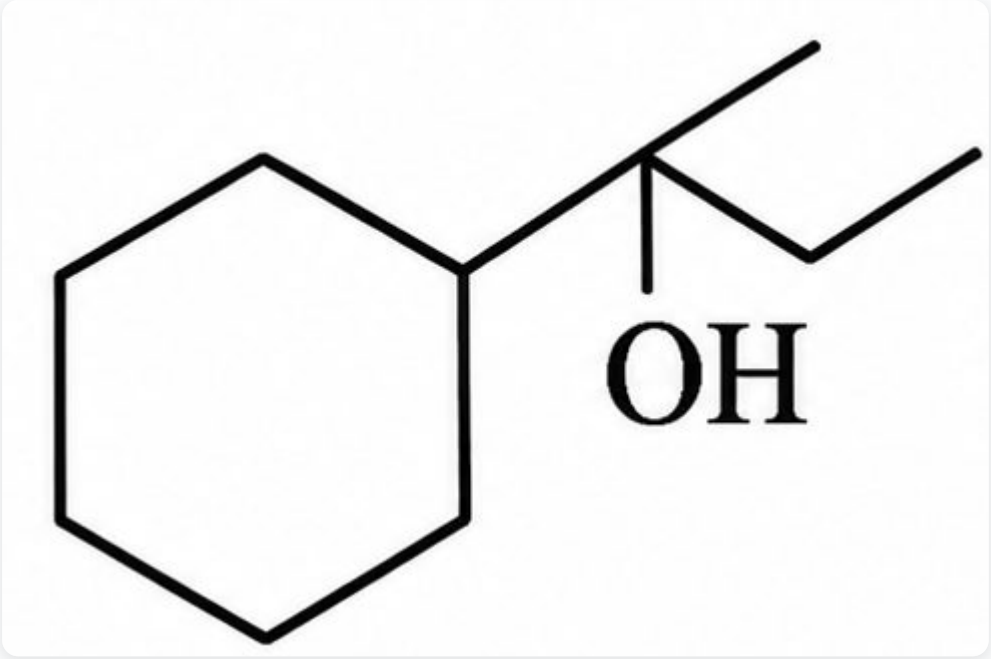
(C) $–CHCl_2$

(D) $–CH_2Cl$

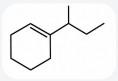
Question 123.

Which of the following is not the product of dehydration of ?

[4 Marks]



(A)



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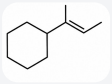
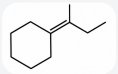
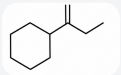


(C)



(D)



Question 124.

Reaction of a carbonyl compound with one of the following reagents involves nucleophilic addition followed by elimination of water. The reagent is:

[4 Marks]

(A) A Grignard reagent

(B) Hydrazine in presence of feebly acidic solution

(C) Hydrocyanic acid

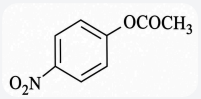
(D) Sodium hydrogen sulphite

Question 125.

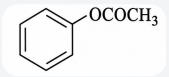
Which one of the following esters gets hydrolysed most easily under alkaline condition?

[4 Marks]

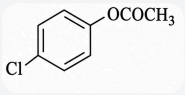
(A)



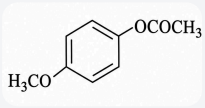
(B)



(C)



(D)



Question 126.

The number of structural isomers possible from the molecular formula C_3H_9N is:

[4 Marks]

(A) 4

(B) 2

(C) 5

(D) 3

Question 127.

Method by which aniline cannot be prepared is:

[4 Marks]

(A) Potassium salt of phthalimide treated with chlorobenzene followed by hydrolysis with aqueous NaOH solution.

(B) Reduction of nitrobenzene with H_2/Pd in ethanol

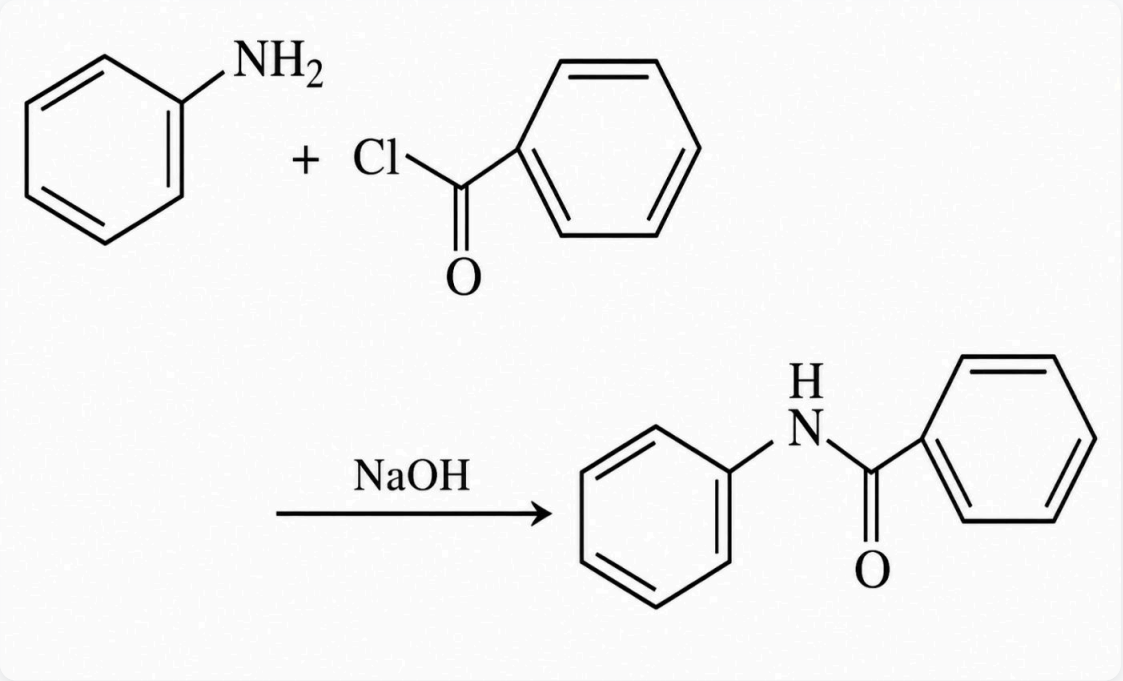
(C) Degradation of benzamide with bromine in alkaline solution

(D) Hydrolysis of phenyl isocyanide with acidic solution

Question 128.

The following reaction is known by the name

[4 Marks]



(A) Acetylation reaction

(B) Schotten-Baumen reaction

(C) Friedel-Craft's reaction

(D) Perkin's reaction

Question 129.

Caprolactum is used for the manufacture of:

[4 Marks]

(A) Nylon-6,6

(B) Terylene

(C) Nylon-6

(D) Teflon

Question 130.

What is the mole fraction of the solute in a 1.00 m aqueous solution ?

[4 Marks]

(A) 0.177

(B) 0.0354

(C) 1.770

(D) 0.0177

Question 131.

Decreasing order of stability of O_2, O_2^-, O_2^+ and O_2^{2-} is:

[4 Marks]

(A) $O_2^- > O_2^{2-} > O_2^+ > O_2$

(B) $O_2^{2-} > O_2^- > O_2 > O_2^+$

(C) $O_2 > O_2^+ > O_2^{2-} > O_2^-$

(D) $O_2^+ > O_2 > O_2^- > O_2^{2-}$

Question 132.

The hybridization involved in complex $[Ni(CN)_4]^{2-}$ is: (At. No. Ni = 28)

[4 Marks]

(A) dsp^2

(B) sp^3

(C) d^2sp^2

(D) d^2sp^3

Question 133.

The vacant space in bcc lattice cell is:

[4 Marks]

(A) 32%

(B) 48%

(C) 26%

(D) 23%

Question 134.

The oxidation of benzene by V_2O_5 in the presence of air produces:

[4 Marks]

(A) Benzaldehyde

(B) Benzoic acid

(C) Benzoic anhydride

(D) Maleic anhydride

Question 135.

The correct statement regarding defects in crystalline solid is:

[4 Marks]

(A) Frenkel defect is a dislocation defect.

(B) Frenkel defect s found in halides of alkaline metals.

(C) Frenkel defects decrease the density of crystalline solids

(D) Schottky defects have no effect on the density of crystalline solids