



NEET 2018

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Biology

Instructions

For the following questions answer them individually

Question 1

Niche is

- A the functional role played by the organism where it lives
- B the range of temperature that the organism needs to live
- C the physical space where an organism lives
- D all the biological factors in the organism's environment

Answer: A

Question 2

Which of the following is a secondary pollutant ?

- A O_3
- B SO_2
- C CO_2
- D CO

Answer: A

Question 3

In stratosphere, which of the following elements acts as a catalyst in degradation of ozone and release of molecular oxygen ?

- A Oxygen
- B Fe
- C Cl
- D Carbon

Answer: C

Question 4

World Ozone Day is celebrated on

- A 22nd April
- B 16th September
- C 21st April
- D 5th June

Answer: B

Question 5

What type of ecological pyramid would be obtained with the following data?

Secondary consumer: 120 g,

Primary consumer: 60 g

Primary producer: 10 g

- A Upright pyramid of biomass
- B Upright pyramid of numbers
- C Pyramid of energy
- D Inverted' Pyramid of biomass

Answer: D

Question 6

Natality refers to

- A Number of individuals exiting a habitat
- B Number of individuals leaving the habitat
- C Birthrate
- D Death rate

Answer: C

Question 7

Offsets are produced by

- A Parthenogenesis
- B Parthenocarpy
- C Mitotic divisions
- D Meiotic divisions

Answer: C

Question 8

The experimental proof for semiconservative replication of DNA was first shown in a

- A Virus
- B Plant
- C Bacteria
- D Fungus

Answer: C

Question 9

Select the correct match:

- A Francois Jacob and - Lac operon Jacques Monod
- B Matthew Meselson - Pisum sativum and F. Stahl
- C Alfred Hershey and - TMV Martha Chase
- D Alec Jeffreys - Streptococcus pneumoniae

Answer: A

Question 10

Which of the following has proved helpful in preserving pollen as fossils ?

- A Sporopollenin
- B Oil content
- C Cellulosic intine
- D Pollenkit

Answer: A

Question 11

Which of the following pairs is wrongly matched?

- A T.H Morgan : Linkage
- B XO type sex : Grasshopper determination
- C ABO blood grouping : Co-dominance
- D Starch synthesis in pea : Multiple alleles

Answer: D

Question 12

Which of the following flowers only once in a life-time ?

- A Papaya
- B Mango
- C Jackfruit
- D Bamboo species

Answer: D

Question 13

Select the Gorrect statement:

- A Transduction was discovered by S. Altman.
- B Spliceosomes take part in translation.
- C Punnett square was developed by a British Scientist.
- D Franklin Stahl coined the term "linkage".

Answer: C

Question 14

The Golgi complex participates in

- A Activation of amino acids
- B Respiration in bacteria
- C Formation of secretory vesicles
- D Fatty acid breakdown

Answer: C

Question 15

The stage during which separation of the paired homologous chromosomes begins is

- A Zygotene
- B Diakinesis
- C Diplotene
- D Pachytene

Answer: C

Question 16

Stomata movement is not affected by

- A CO_2 Concentration
- B O_2 Concentration
- C Light
- D Temperature

Answer: B

Question 17

Stomata in grass leaf are

- A Barrel shaped
- B Rectangular
- C Kidney shaped
- D Pampa shapes

Answer: D

Question 18

Which of the following is not a product of light reaction of photosynthesis ?

- A Oxygen
- B NADPH
- C NADH
- D ATP

Answer: C

Question 19

Which of the following is true for nucleolus?

- A It is a site for active ribosomal RNA synthesis.
- B It takes part in spindle formation
- C It is a membrane-bound Structure.
- D Larger nucleoli are present in dividing cells.

Answer: A

Question 20

Which among the following is not a prokaryote?

- A Oscillatoria
- B Nostoc
- C Mycobacterium
- D Saccharomyces

Answer: D

Question 21

The two functional groups characteristic of sugars are

- A Carbonyl and hydroxyl
- B Carbonyl and phosphate
- C Carbonyl and methyl
- D Hydroxyl and methyl

Answer: A

Question 22

Match the items given in Column I with those in Column II and select the correct option given below :

Column - I

- (a) Herbarium
- (b) Key
- (c) Museum
- (d) Catalogue

Column - II

- (i) It is a place having a collection of preserved plants and animals
- (ii) A list that enumerates methodically all the species found in an area with brief description aiding identification
- (iii) Is a place where dried and pressed plant specimens mounted on sheets are kept
- (iv) A booklet containing a list of characters and their alternates which are helpful in identification of various taxa.

A a-iii, b-iv, c-i, d-ii

B a-ii, b-iv, c-iii, d-i

C a-iii, b-ii, c-i, d-iv

D a-i, b-iv, c-iii, d-ii

Answer: A

Question 23

Which one is wrongly matched ?

A Unicellular organism - Chlorella

B Gemma cups - Marchantia

C Biflagellate zoospores - Brown algae

D Uniflagellate gametes - Polysiphonia

Answer: D

Question 24

After karyogamy followed by Meiosis, spores are produced exogenously in

A Saccharomyces

B Agaricus

C Alternaria'

D Neurospora

Answer: B

Question 25

Winged pollen grains are present in

A Pinus

B Mango

C Cycas

D Mustard

Answer: A

Question 26

Which of the following is commonly used as a vector for introducing a DNA fragment in human lymphocytes?

A pBR 322

B λ phage

C Ti plasmid

D Retrovirus

Answer: D

Question 27

A 'new' variety of rice was patented by a foreign company, though such varieties have been present in India for a long time. This is related to

A Basmati

B Lerma Rojo

C Sharbati Sonora

D Co-667

Answer: A

Question 28

Use of bioresources by multinational companies and organisations without authorisation from the concerned country and its people is called

A Bipexploitation

B Bitdegradation

C Biopiracy

D Bio-infringement

Answer: C

Question 29

Select the correct match:

A G. Mendel – Transformation

B T.H. Morgan - Transduction

C $F_2 \times$ Recessive parent - Dihybrid cross

D Ribozyme – Nucleic acid

Answer: D

Question 30

The correct order of steps in Polymerase Chain Reaction (PCR) is

A Denaturation, Annealing, Extension

B Denaturation, Extension, Annealing

C Annealing, Extension, Denaturation

D Extension, Denaturation, Annealing

Answer: A

Question 31

In India, the organisation responsible for assessing the safety of introducing genetically modified organisms for public use is

- A Genetic Engineering Appraisal Committee (GEAC)
- B Research Committee on Genetic Manipulation (RCGM)
- C Council for Scientific and Industrial Research (CSIR)
- D Indian Council of Medical Research (ICMR)

Answer: A

Question 32

What is the role of NAD^+ in cellular respiration?

- A It is the final electron acceptor for anaerobic respiration
- B It is a nucleotide source for ATP synthesis.
- C It functions as an electron carrier.
- D It functions as an enzyme.

Answer: C

Question 33

Which one of the following plants shows a very close relationship with a species of moth, where none of the two can complete its life cycle without the other?

- A Viola
- B Banana
- C Yucca
- D Hydrilla

Answer: C

Question 34

Pollen grains can be stored for several years in liquid nitrogen having a temperature of

- A -160°C
- B -196°C
- C -80°C
- D -120°C

Answer: B

Question 35

In which of the following forms is iron absorbed by plants?

- A Both ferric and ferrous

- B Free element
- C Ferrous
- D Ferric

Answer: D

Question 36

Double fertilization is

- A Syngamy and triple fusion
- B Fusion of two male gametes with one egg
- C Fusion of one male gamete, with two polar nuclei
- D Fusion of two male gametes of a pollen tube with two different eggs

Answer: A

Question 37

Oxygen is not produced during photosynthesis by

- A Chara
- B Cycas
- C Nostoc
- D Green sulphur bacteria

Answer: D

Question 38

Which of the following elements is responsible for maintaining turgor in cells ?

- A Calcium
- B Potassium
- C Sodium
- D Magnesium

Answer: B

Question 39

Pneumatophores occur in

- A Submerged hydrophytes
- B Carnivorous plants
- C Free-floating hydrophytes
- D Halophytes

Answer: D

Question 40

Select the wrong statement:

- A Mitochondria are the powerhouse of the cell in all kingdoms except Monera.
- B Pseudopodia are locomotory and feeding structures in Sporozoans
- C Mushrooms belong to Basidiomycetes.
- D Cell wall is present in members of Fungi and Plantae

Answer: B

Question 41

Secondary xylem and phloem in dicot stem are produced by

- A Axillary meristems
- B Phellogen
- C Vascular cambium
- D Apical meristems

Answer: C

Question 42

Sweet potato is a modified

- A Rhizome
- B Tap root
- C Adventitious root
- D Stem

Answer: C

Question 43

Which of the following statements is correct?

- A Stems are usually unbranched in both Cycas and Cedrus.
- B Horsetails are gymnosperms
- C Seleginella is heterosporous, while Salavinia is homosporous
- D Ovules are not enclosed by ovary wall in gymnosperms

Answer: D

Question 44

Casparian strips occur in

- A Endodermis
- B Cortex

C Pericycle

D Epidermis

Answer: D

Question 45

Plants having little or no secondary growth are

A Cycads

B Conifers

C Deciduous angiosperms

D Grasses

Answer: D

Question 46

Nissl bodies are mainly composed of

A Free ribosomes and RER

B Nucleic acids and SER

C DNA and RNA

D Proteins and lipids

Answer: A

Question 47

Which of these statements is incorrect ?

A Oxidative phosphorylation takes place in outer mitochondrial membrane.

B Glycolysis operates as long as it is supplied with NAD that can pick up hydrogen atoms.

C Glycolysis occurs in cytosol.

D Enzymes of TCA cycle are present in mitochondrial matrix.

Answer: A

Question 48

Many ribosomes may associate with a single mRNA to form multiple copies of a polypeptide simultaneously. Such strings of ribosomes are termed as

A Nucleosome

B Plastidome

C Polyhedral bodies

D Polysome

Answer: D

Question 49

Which of the following terms describe human dentition ?

- A Pleurodont, Diphyodont, Heterodont
- B Pleurodont, Monophyodont, Homodont
- C Thecodont, Diphyodont, Heterodont
- D Thecodont, Diphyodont, Homoedont

Answer: C

Question 50

Which of the following events does not occur in rough endoplasmic reticulum ?

- A Phospholipid synthesis
- B Cleavage of signal peptide
- C Protein glycosylation
- D Protein folding

Answer: A

Question 51

Select the incorrect match:

- A Polytene - Oocytes of amphibians chromosomes
- B Submetacentric - L-shaped chromosomes
- C Allosomes - Sex chromosomes
- D Lampbrush-Diplotene bivalents chromosomes

Answer: A

Question 52

Which of the following is an amino acid derived hormone

- A Estriol
- B Estradiol
- C Ecdysone
- D Epinephrine

Answer: D

Question 53

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

- A Corpus callosum : band of fibers connecting left and right cerebral hemispheres.
- B Hypothalamus : production of releasing hormones and regulation of temperature, hunger and thirst.

- C Limbic system : consists of fibre tracts that interconnect different regions of brain; controls movement:
- D Medulla oblongata : controls respiration and cardiovascular reflexes.

Answer: C

Question 54

Which of the following -hormones can play a significant role in osteoporosis ?

- A Parathyroid hormone and Prolactin
- B Estrogen and Parathyroid hormone
- C Progesterone and Aldosterone
- D Aldosterone and Prolactin

Answer: B

Question 55

The transparent lens in the human eye is held in its place by

- A smooth muscles attached to the ciliary body
- B 'smooth muscles attached to the iris
- C ligaments attached to the iris
- D ligaments attached to the ciliary body

Answer: D

Question 56

In a growing population of a country,

- A pre-reproductive individuals are less than the reproductive individuals.
- B reproductive and pre-reproductive individuals are equal in number.
- C reproductive individuals are less than the post-reproductive individuals.
- D pre-reproductive individuals are more than the reproductive individuals.

Answer: D

Question 57

Match the items given in Column I with those in Column II and select the correct option given below?

Column - I

- (a) Eutrophication
- (b) Sanitary land fill
- (c) Snow blindness
- (d) Jhum cultivation

Column - II

- (i) UV-B radiation
- (ii) Deforestation
- (iii) Nutrient enrichment
- (iv) Waste disposal

- A a-i, b-ii, c-iv, d-iii
- B a-iii, b-iv, c-i, d-ii

C a-i, b-iii, c-iv, d-ii

D a-ii, b-i, c-iii, d-iv

Answer: B

Question 58

Which part of poppy plant is used to obtain the drug "Smack" ?

A Leaves

B Roots

C Latex

D Flowers

Answer: C

Question 59

Which one of the following population interactions is widely used in medical science for the production of antibiotics?

A Amensalism

B Parasitism

C Mutualism

D Commensalism

Answer: A

Question 60

All of the following are included in 'Ex-situ conservation' except

A Seed banks

B Botanical gardens

C Sacred groves

D Wildlife safari parks

Answer: C

Question 61

Which of the following gastric cells indirectly help in erythropoiesis ?

A Parietal cells

B Goblet cells

C Mucous cells

D Chief cells

Answer: A

Question 62

Match the items given in Column I with those in Column II and select the correct option given below :

Column - I

- (a) Fibrinogen
- (b) Globulin
- (c) Albumin

Column - II

- (i) Osmotic balance
- (ii) Blood clotting
- (iii) Defence mechanism

- A a-ii, b-iii, c-i
- B a-i, b-iii, c-ii
- C a-i, b-ii, c-iii
- D a-iii, b-ii, c-i

Answer: A

Question 63

Calcium is important in skeletal, muscle contraction because it

- A prevents the formation of bonds between the myosin cross bridges and the actin filament.
- B detaches the myosin head from the actin filament.
- C activates the myosin ATPase by binding to it.
- D binds to troponin to remove the masking of active sites, on actin for myosin.

Answer: D

Question 64

Which of the following is an occupational respiratory disorder?

- A Emphysema
- B Botulism
- C Silicosis
- D Anthracis

Answer: C

Question 65

AGGTATCGCAT is a sequence from the coding strand of a gene. What will be the corresponding sequence of the transcribed mRNA ?

- A UCCAUAGCGUA
- B ACCUAUGCGAU
- C UGGTUTCGCAT
- D AGGUAUCGCAU

Answer: D

Question 66

A woman has an X-linked condition on one of her X chromosomes. This chromosome can be inherited by

- A Both sons and daughters
- B Only grandchildren
- C Only sons
- D Only daughters

Answer: A

Question 67

Match the items given in Column I with those in Column II and select the correct option given below

Column - I

- (a) Proliferative Phase
- (b) Secretory Phase
- (c) Menstruation

Column - II

- (i) Breakdown of endometrial lining
- (ii) Follicular Phase
- (iii) Defence mechanism

- A a-iii, b-i, c-ii
- B a-ii, b-iii, c-i
- C a-i, b-iii, c-ii
- D a-iii, b-ii, c-i

Answer: B

Question 68

According to Hugo de Vries, the mechanism of evolution is

- A Minor mutations
- B Phenotypic Variations
- C Saltation
- D Multiple step mutations

Answer: C

Question 69

All of the following are part of an operon except

- A a promoter
- B an enhancer
- C structural genes
- D an operator

Answer: B

Question 70

Which of the following options correctly represents the lung conditions in asthma and emphysema, respectively ?

- A Decreased respiratory surface; Inflammation of bronchioles
- B Increased respiratory surface; Inflammation of bronchioles
- C Increased number of bronchioles; Increased respiratory surface
- D Inflammation of bronchioles; Decreased respiratory surface

Answer: D

Question 71

Match the items given in Column I with those in Column II and select the correct option given below :

Column - I

- (a) Tricuspid valve
- (b) Bicuspid valve
- (c) Semilunar valve

Column - II

- (i) Between left atrium and left ventricle
- (ii) Between right ventricle and pulmonary artery
- (iii) Between right atrium and right ventricle

- A a-ii, b-i, c-iii
- B a-i, b-ii, c-iii
- C a-i, b-iii, c-ii
- D a-iii, b-i, c-ii

Answer: D

Question 72

Match the items given in Column I with those in Column II and select the correct option given below :

Column - I

- (a) Tidal volume
- (b) Inspiratory Reserve volume
- (c) Expiratory Reserve volume
- (d) Residual volume

Column - II

- (i) 2500 – 3000 mL
- (ii) 1100 – 1200 mL
- (iii) 500 – 550 mL
- (iv) 1000 – 1100 mL

- A a-iv, b-iii, c-ii ,d-i
- B a-i, b-iv, c-ii ,d-iii
- C a-iii, b-i, c-iv ,d-ii
- D a-iii, b-ii, c-i ,d-iv

Answer: C

Question 73

Hormones secreted by the placenta to maintain pregnancy are

- A hCG, progestogens, estrogens, glucocorticoids
- B hCG, hPL, progestogens, estrogens
- C hCG, hPL, estrogens, relaxin, oxytocin

D hCG, hPL, progesterone, prolactin

Answer: B

Question 74

The contraceptive 'SAHELI'?

A is a post-coital contraceptive.

B is an IUD.

C increases the concentration of estrogen and prevents ovulation in females.

D blocks estrogen receptors in the uterus, preventing eggs from getting implanted.

Answer: D

Question 75

The difference between spermiogenesis and spermiation is

A In spermiogenesis spermatozoa are formed, while in spermiation spermatozoa are released from Sertoli cells into the cavity of seminiferous tubules.

B In spermiogenesis spermatozoa from Sertoli cells are released into the 'cavity of seminiferous tubules, while in spermiation spermatozoa are formed.

C In spermiogenesis spermatozoa are formed, while in spermiation spermatids are formed.

D In spermiogenesis spermatids are formed, while in spermiation spermatozoa are formed.

Answer: A

Question 76

The amnion of mammalian embryo is derived from

A ectoderm and endoderm

B mesoderm and trophoblast

C endoderm and mesoderm

D ectoderm and mesoderm

Answer: C

Question 77

Which of the following animals does not undergo metamorphosis ?

A Starfish

B Moth

C Tunicate

D Earthworm

Answer: D

Question 78

Which one of these animals is not a homeotherm ?

- A Psittacula
- B Camelus
- C Chelone
- D iacropus

Answer: C

Question 79

Which of the following features is used to identify a male cockroach from a female cockroach ?

- A Presence of analcerci
- B Forewings with darker tegmina
- C Presence of caudal styles
- D Presence of a boat shaped sternum on the 9th abdominal segment

Answer: C

Question 80

Which of the following organisms are known as chief producers in the oceans ?

- A Euglenoids
- B Cyanobacteria
- C Diatoms
- D Dinoflagellates

Answer: C

Question 81

Ciliates differ from all other protozoans in

- A having two types of nuclei
- B using pseudopodia for capturing prey
- C having a contractile vacuole for removing excess water
- D using flagella for locomotion

Answer: A

Question 82

Identify the vertebrate group of animals characterized by crop and gizzard in its digestive system.

- A Osteichthyes
- B Aves

- C Reptilia
- D Amphibia

Answer: B

Question 83

Match the items given in Column I with those in Column II and select the correct option given below :

Column - I

- (a) Glycosuria
- (b) Gout
- (c) Renal calculi
- (d) Glomerular nephritis

Column - II

- (i) Accumulation of uric acid in joints
- (ii) Mass of crystallised salts within the kidney
- (iii) Inflammation in glomeruli
- (iv) Presence of glucose in urine

- A a-iv, b-i, c-ii, d-iii
- B a-ii, b-iii, c-i, d-iv
- C a-i, b-ii, c-iii, d-iv
- D a-iii, b-ii, c-iv, d-i

Answer: A

Question 84

Match the items given in Column I with those in Column II and select the correct option given below :

Column - I

- (Function)
- (a) Ultrafiltration
 - (b) Concentration of urine
 - (c) Transport of urine
 - (d) Storage of urine

Column - II

- (Part of Excretory system)
- (i) Henle's loop
 - (ii) Ureter
 - (iii) Urinary bladder
 - (iv) Malpighian corpuscle
 - (v) Proximal convoluted tubule

- A a-v, b-iv, c-i, d-iii
- B a-v, b-iv, c-i, d-ii
- C a-iv, b-i, c-ii, d-iii
- D a-iii, b-v, c-ii, d-iii

Answer: C

Question 85

Among the following sets of examples for divergent evolution, select the incorrect option:

- A Eye of octopus, bat and man
- B Brain of bat, man and cheetah
- C Heart of bat, man and cheetah
- D Forelimbs of man, bat and cheetah

Answer: A

Question 86

Conversion of milk to curd improves its nutritional value by increasing the amount of

- A Vitamin E
- B Vitamin B_{12}
- C Vitamin A
- D Vitamin D

Answer: B

Question 87

Which of the following characteristics represent 'Inheritance of blood groups' in humans?

- a. Dominance
- b. Co-dominance
- c. Multiple allele
- d. Incomplete dominance
- e. Polygenic inheritance

- A a,c and e
- B b,d and e
- C a,b and e
- D b,c and e

Answer: C

Question 88

Which of the following is not an autoimmune disease ?

- A Vitiligo
- B Alzheimer's disease
- C Rheumatoid arthritis
- D Psoriasis

Answer: B

Question 89

The similarity of bone structure in the forelimbs of many vertebrates is an example of

- A Adaptive radiation
- B Convergent evolution
- C Analogy
- D Homology

Answer: D

Question 90

In which disease does mosquito transmitted pathogen .cause chronic inflammation of vessels

- A Amoebiasis
- B Ring worm disease
- C Ascariasis
- D Elephantiasis

Answer: D

Physics

Instructions

For the following questions answer them individually

Question 91

A carbon resistor of $(47 \pm 4.7) k\Omega$ is to be marked with rings of different colours for its identification. The colour code sequence will be

- A Green- Orange – Violet – Gold
- B Yellow – Green – Violet – Gold
- C Yellow – Violet – Orange – Silver
- D Violet – Yellow – Orange – Silver

Answer: C

Question 92

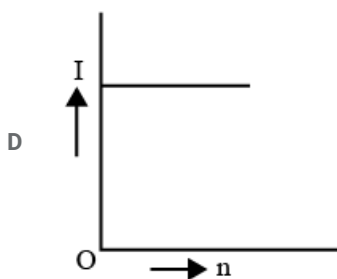
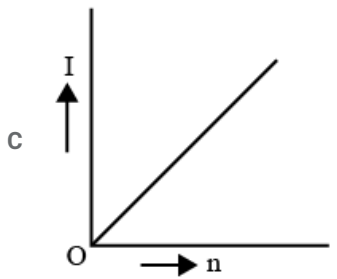
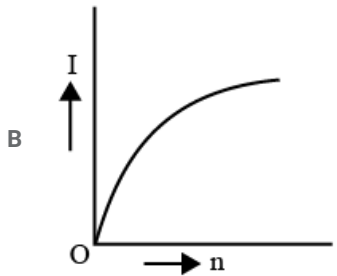
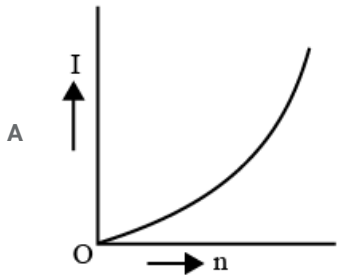
A set of 'n' equal resistors, of value 'R' each, are connected in series to a battery of emf 'E' and internal resistance 'R'. The current drawn is I. Now, the 'n' resistors are connected in parallel to the same battery. Then the current drawn from battery becomes 10 I. The value of 'n' is

- A 9
- B 20
- C 11
- D 10

Answer: D

Question 93

A battery consists of a variable number 'n' of identical cells (having internal resistance 'r' each) which are connected in series. The terminals of the battery are short-circuited and the current I is measured. Which of the graphs shows the correct relationship between I and n?



Answer: D

Question 94

The power radiated by a black body is P and it radiates maximum energy at wavelength, radiates maximum energy at wavelength, λ_0 . If the temperature of the black body is now changed so that it radiates maximum energy at wavelength $\frac{3}{4}\lambda_0$, the power radiated by it becomes nP . The value of n is

A $\frac{81}{256}$

B $\frac{256}{81}$

C $\frac{4}{3}$

D $\frac{3}{4}$

Answer: B

Question 95

Two wires are made of the same material and have the same volume. The first wire has cross-sectional area A and the second wire has cross-sectional area $3A$. If the length of the first wire is increased by δl on applying a force F , how much force is needed to stretch the second wire by the same amount ?

- A F
- B $4F$
- C $6F$
- D $9F$

Answer: D

Question 96

A sample of 0.1 g of water at 100°C and normal pressure ($1.013 \times 10^5 \text{Nm}^{-2}$) requires 54 cal of heat energy to convert to steam at 100° . If the volume of the steam produced is 167.1 cc, the change in internal energy of the sample, is

- A 84.5 J
- B 42.2 J
- C 208.7 J
- D 104.3 J

Answer: C

Question 97

A small sphere of radius ' r ' falls from rest in a viscous liquid. As a result, heat is produced due to viscous force. The rate of production of heat when the sphere attains its terminal velocity, is proportional to

- A r^4
- B r^5
- C r^2
- D r^3

Answer: B

Question 98

The moment of the force, $\vec{F} = 4\hat{i} + 5\hat{j} - 6\hat{k}$ at $(2, 0, -3)$, about the point $(2, -2, -2)$, is given by

- A $-7\hat{i} - 4\hat{j} - 8\hat{k}$
- B $-7\hat{i} - 8\hat{j} - 4\hat{k}$
- C $-4\hat{i} - \hat{j} - 8\hat{k}$
- D $-8\hat{i} - 4\hat{j} - 7\hat{k}$

Answer: A

Question 99

A student measured the diameter of a small steel ball using a screw gauge of least count 0.001 cm. The main scale reading is 5 mm and zero of circular scale division coincides with 25 divisions above the reference level. If screw gauge has a zero error of -0.004 cm, the correct diameter of the ball is

- A 0.529 cm
- B 0.053 cm
- C 0.525 cm
- D 0.521 cm

Answer: A

Question 100

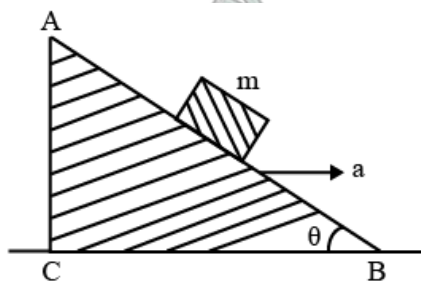
A toy car with charge q moves on a frictionless horizontal plane surface, under the influence of a uniform electric field \vec{E} . Due to the force $q\vec{E}$, its velocity increases from 0 to $6 \frac{m}{s}$ in one second duration. At that instant the direction of the field is reversed. The car continues to move for two more seconds under the influence of this field. The average velocity and the average speed of the toy car between 0 to 3 seconds are respectively

- A $1.5 \frac{m}{s}, 3 \frac{m}{s}$
- B $1 \frac{m}{s}, 3.5 \frac{m}{s}$
- C $1 \frac{m}{s}, 3 \frac{m}{s}$
- D $2 \frac{m}{s}, 4 \frac{m}{s}$

Answer: C

Question 101

A block of mass m is placed on a smooth inclined wedge ABC of inclination θ as shown in the figure. The wedge is given an acceleration 'a' towards the right. The relation between a and θ for the block to remain stationary on the wedge is



- A $a = g \tan \theta$
- B $a = g \cos \theta$
- C $a = \frac{g}{\sin \theta}$
- D $a = \frac{g}{\operatorname{cosec} \theta}$

Answer: A

Question 102

An em wave is propagating in a medium with a velocity $\vec{V} = V \hat{i}$. The instantaneous oscillating electric field of this em wave is along +y axis. Then the direction of oscillating magnetic field of the em wave will be along

- A - x direction
- B - y direction
- C + z direction
- D - z direction

Answer: C

Question 103

The refractive index of the material of a prism is $\sqrt{2}$ and the angle of the prism is 30° . One of the two refracting surfaces of the prism is made a mirror inwards, by silver coating. A beam of monochromatic light entering the prism from the other face will retrace its path (after reflection from the silvered surface) if its angle of incidence on the prism is

- A zero
- B 30°
- C 45°
- D 60°

Answer: C

Question 104

The magnetic potential energy stored in a certain inductor is 25 mJ, when the current in the inductor is 60 mA. This inductor is of inductance

- A 13.89 H
- B 1.389 H
- C 138.88 H
- D 0.138 H

Answer: A

Question 105

An object is placed at a distance of 40 cm from a concave mirror of focal length 15 cm. If the object is displaced through a distance of 20 cm towards the mirror, the displacement of the image will be

- A 36 cm towards the mirror
- B 80 cm towards the mirror
- C 36 cm away from the mirror
- D 30 cm away from the mirror

Answer: C

Question 106

The ratio of kinetic energy to the total energy of an electron in a Bohr orbit of the hydrogen atom, is

- A 1:-2

- B 2:-1
- C 1:-1
- D 1:1

Answer: C

Question 107

An electron of mass m with an initial velocity $\vec{V} = V_0 \hat{i} (V_0 > 0)$ enters an electric field $\vec{E} = -E_0 \hat{i} (E_0 = \text{constant} > 0)$ at $t=0$. If λ_0 is its de-Broglie wavelength initially, then its de-Broglie wavelength at time t is

- A λ_0
- B $\lambda_0 t$
- C $\lambda_0 \left(1 + \frac{eE_0 t}{m v_0} \right)$
- D $\left(1 + \frac{\lambda_0 E_0}{m v_0 t} \right)$

Answer: D

Question 108

when the light of frequency $2 \nu_0$ (where ν_0 is threshold frequency), is incident on a metal plate, the maximum velocity of electrons emitted is v_1 . when the frequency of the incident radiation is increased to $5 \nu_0$, the maximum velocity of electrons emitted from the same plate is V_2 . The ratio of V_1 to V_2 is

- A 2:1
- B 4:1
- C 1:4
- D 1:2

Answer: D

Question 109

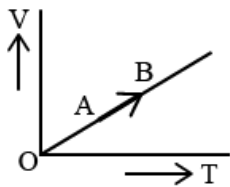
For a radioactive material, half-life is 10 minutes. If initially there are 600 number of nuclei, the time taken (in minutes) for the disintegration of 450 nuclei is

- A 15
- B 30
- C 10
- D 20

Answer: D

Question 110

The volume (V) of a monatomic gas varies with its temperature (T), as shown in the graph. The ratio of work done by the gas, to the heat absorbed by it, when it undergoes a change from state A to state B, is



A $\frac{2}{7}$

B $\frac{1}{3}$

C $\frac{2}{3}$

D $\frac{2}{5}$

Answer: D

Question 111

The fundamental frequency in an open organ pipe is $\frac{5}{3}$ times that of a closed organ pipe. If the length of a closed organ pipe is 20 cm, then the length of closed organ pipe is

A 16 cm

B 12.5 cm

C 8 cm

D 13.2 cm

Answer: D

Question 112

The efficiency of an ideal heat engine working between the freezing point and boiling point of water, is

A 12.5%

B 6.25%

C 20%

D 26.8%

Answer: D

Question 113

At what temperature will the rms speed of oxygen molecules become just sufficient for escaping from the Earth's atmosphere?

(Given : Mass of oxygen molecule (m) = $2.76 \times 10^{-26} \text{ kg}$)

Boltzmann's constant $k_B = 1.38 \times 10^{-23} \text{ JK}^{-1}$

A $1.254 \times 10^4 \text{ K}$

B $5.016 \times 10^4 \text{ K}$

C 8.360×10^4 K

D 2.508×10^4 K

Answer: D

Question 114

Unpolarised light is incident from air on a plane surface of a material of refractive index μ . At a particular angle of incidence 'i', it is found that the reflected and refracted rays are perpendicular to each other. Which of the following options is correct for this situation ?

A $i = \tan^{-1} \left(\frac{1}{\mu} \right)$

B $i = \sin^{-1} \left(\frac{1}{\mu} \right)$

C Reflected light is polarised with its electric vector perpendicular to the plane of incidence

D Reflected light is polarised with its electric vector parallel to the plane of incidence

Answer: C

Question 115

In Young's double slit experiment the separation d between the slits is 2 mm, the wavelength λ of the light used is 5896 Å and distance D between the screen and slits is 100 cm. It is found that the angular width of the fringes is 0.20° . To increase the fringe angular width to 0.21° (with same λ and D) the separation between the slits needs to be changed to

A 1.7 mm

B 2.7 mm

C 1.9 mm

D 1.8 mm

Answer: C

Question 116

An astronomical, refracting telescope will have large angular magnification and high angular resolution, when it has an objective lens of

A small focal length and small diameter

B large focal length and large diameter

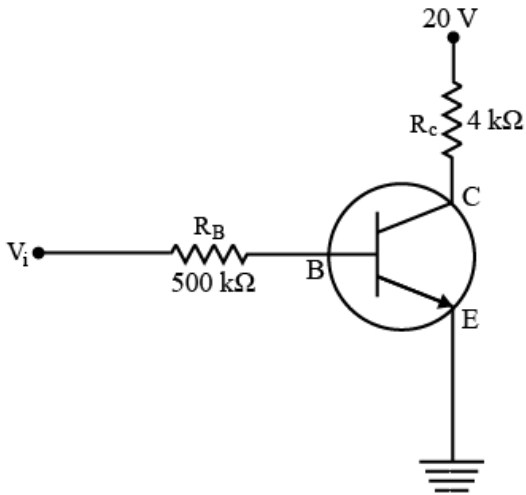
C large focal length and small diameter

D small focal length and large diameter

Answer: B

Question 117

In the circuit shown in the figure, the input voltage V_i is 20 V, $V_{BE}=0$ and $V_{CE}=0$. The values of I_B, I_C, β are given by



- A $I_B=40 \mu A, I_C=5 mA, \beta=125$
- B $I_B=20 \mu A, I_C=5 mA, \beta=250$
- C $I_B=25 \mu A, I_C=5 mA, \beta=200$
- D $I_B=40 \mu A, I_C=10 mA, \beta=250$

Answer: A

Question 118

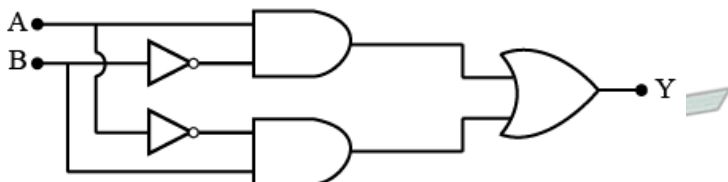
In a p-n junction diode, change in temperature due to heating

- A affects the overall $V - I$ characteristics, of p-n junction
- B does not affect resistance of p-n junction
- C affects only forward resistance
- D affects only reverse resistance

Answer: A

Question 119

In the combination of the following gates the output Y can be written in terms of inputs A and B as



- A $\overline{A+B}$
- B $\overline{A.B} + A.B$
- C $A.\overline{B} + \overline{A}.B$
- D $\overline{A.B}$

Answer: C

Question 120

A metallic rod of mass per unit length 0.5 kg m^{-1} is lying horizontally on a smooth inclined plane which makes an angle of 30° with the horizontal. The rod is not allowed to slide down by flowing a current through it when a magnetic field of induction 0.25 T is acting on it in the vertical direction. The current flowing in the rod to keep it stationary is

- A 11.32 A
- B 14.76 A
- C 5.98 A
- D 7.14 A

Answer: A

Question 121

An inductor 20 mH , a capacitor $100 \mu\text{F}$ and a resistor 50Ω are connected in series across a source of emf, $V = 10 \sin 314 t$. The power loss in the circuit is

- A 1.13 W
- B 2.74 W
- C 0.43 W
- D 0.79 W

Answer: D

Question 122

A thin diamagnetic rod is placed vertically between the poles of an electromagnet. When the current in the electromagnet is switched on, then the diamagnetic rod is pushed up, out of the horizontal magnetic field. Hence, the rod gains gravitational potential energy. The work required to do this comes from

- A the induced electric field due to the changing magnetic field
- B the lattice structure of the material of the rod
- C the magnetic field
- D the current source

Answer: D

Question 123

Current sensitive of a moving coil galvanometer is $5 \frac{\text{div}}{\text{mA}}$ and its voltage sensitivity (angular deflection per unit voltage applied) is $20 \frac{\text{div}}{\text{V}}$. The resistance of the galvanometer is

- A 500Ω
- B 250Ω
- C 25Ω
- D 40Ω

Answer: B

Question 124

A tuning fork is used to produce resonance in a glass tube. The length of the air column in this tube can be adjusted by a variable piston. At room temperature of 27°C two successive resonances are produced at 20 cm and 73 cm of column length. If the frequency of the tuning fork is 320 Hz, the velocity of sound in air at 27°C is

- A $300 \frac{\text{m}}{\text{s}}$
- B $350 \frac{\text{m}}{\text{s}}$
- C $339 \frac{\text{m}}{\text{s}}$
- D $330 \frac{\text{m}}{\text{s}}$

Answer: C

Question 125

The electrostatic force between the metal plates of an isolated parallel plate capacitor C having a charge Q and area A, is

- A inversely proportional to the distance between the plates.
- B proportional to the square root of the distance between the plates.
- C linearly proportional to the distance between the plates.
- D independent of the distance between the plates.

Answer: D

Question 126

A pendulum is hung from the roof of a sufficiently high building and is moving freely to and fro like a simple harmonic oscillator. The acceleration of the bob of the pendulum is $20 \frac{\text{m}}{\text{s}^2}$ at a distance of 5 m from the mean position. The time period of oscillation

- A 1 s
- B 2 s
- C π s
- D 2π s

Answer: C

Question 127

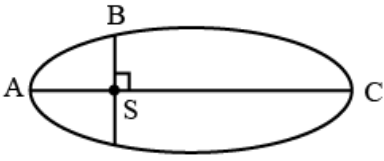
An electron falls from rest through a vertical distance h in a uniform and vertically upward directed electric field E. The direction of electric field is now reversed, keeping its magnitude the same. A proton is allowed to fall from rest in it through the same vertical distance h. The time of fall of the electron, in comparison to the time of fall of the proton is

- A equal
- B 10 times greater
- C 5 times greater
- D smaller

Answer: D

Question 128

The kinetic energies of a planet in an elliptical orbit about the Sun, at positions A, B and C are K_A, K_B and K_C , respectively. AC is the major axis and SB is perpendicular to AC at the position of the Sun S as shown in the figure. Then



- A $K_B > K_A > K_C$
- B $K_B < K_A < K_C$
- C $K_A > K_B > K_C$
- D $K_A < K_B < K_C$

Answer: C

Question 129

A solid sphere is in rolling motion. In rolling motion a body possesses translational kinetic energy K_t as well as rotational kinetic energy K_r simultaneously. The ratio $K_t : (K_t + K_r)$ for the sphere is

- A 2:5
- B 10:7
- C 5:7
- D 7:10

Answer: C

Question 130

If the mass of the Sun were ten times smaller and the universal gravitational constant were ten times larger in magnitude, which of the following is not correct?

- A 'g' on the Earth will not change.
- B Time period of a simple pendulum on the Earth would decrease.
- C Walking on the ground would become more difficult.
- D Raindrops will fall faster.

Answer: A

Question 131

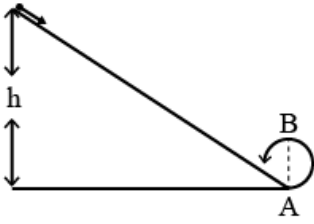
A solid sphere is rotating freely about its symmetry axis in free space. The radius of the sphere is increased keeping its mass same. Which of the following physical quantities would remain constant for the sphere?

- A Angular momentum
- B Rotational kinetic energy
- C Moment of inertia
- D Angular velocity

Answer: A

Question 132

A body initially at rest and sliding along a frictionless track from a height h (as shown in Figure), just completes a vertical circle of diameter $AB=D$. The height h is equal to



- A $\frac{5}{4}D$
- B $\frac{7}{4}D$
- C D
- D $\frac{3}{2}D$

Answer: A

Question 133

Three objects, A : (a solid sphere), B : (a thin circular disk) and C : (a circular ring), each have the same mass M and radius R . They all spin with the same angular speed about their own symmetry axes. The amounts of work (W) required to bring them to rest, would satisfy the relation

- A $W_{\{A\}} > W_{\{C\}} > W_{\{B\}}$
- B $W_{\{B\}} > W_{\{A\}} > W_{\{C\}}$
- C $W_{\{A\}} > W_{\{B\}} > W_{\{C\}}$
- D $W_{\{C\}} > W_{\{B\}} > W_{\{A\}}$

Answer: D

Question 134

Which one of the following statements is incorrect ?

- A Coefficient of sliding friction has dimensions of length
- B Frictional force opposes the relative motion.
- C Limiting value of static friction is directly proportional to normal reaction.
- D Rolling friction is smaller than sliding friction

Answer: A

Question 135

A moving block having mass m , collides with another stationary block having mass $4m$. The lighter block comes to rest after collision. When the initial velocity of the lighter block is v , then the value of coefficient of restitution (e) will be

- A 0.4
- B 0.8

C 0.25

D 0.5

Answer: C

Chemistry

Instructions

For the following questions answer them individually

Question 136

Iron carbonyl, $\text{Fe}(\text{CO})_5$ is

A dinuclear

B trinuclear

C mononuclear

D tetranuclear

Answer: C

Question 137

Match the metal ions given in Column I with the spin magnetic moments of the ions given in Column II and assign the correct code :

Column I

a. Co^{3+}

b. Cr^{3+}

c. Fe^{3+}

d. Ni^{2+}

Column II

i. $\sqrt{8}$ BM

ii. $\sqrt{35}$ BM

iii. $\sqrt{3}$ BM

iv. $\sqrt{24}$ BM

v. $\sqrt{15}$ BM

A a-iii, b-v, c-i, d-ii

B a-iv, b-i, c-ii, d-iii

C a-i, b-ii, c-iii, d-iv

D a-iv, b-v, c-ii, d-i

Answer: D

Question 138

Which of the following ions exhibits d-d transition and paramagnetism as well?

A MnO_4^{2-}

B MnO_4^-

C Cr_2O_7^-

D CrO_4^{2-}

Answer: A

Question 139

The geometry and magnetic behaviour of the complex $[\text{Ni}(\text{CO})_4]$ are

- A tetrahedral geometry and paramagnetic
- B square planar geometry and paramagnetic
- C tetrahedral geometry and diamagnetic
- D square planar geometry and diamagnetic

Answer: C

Question 140

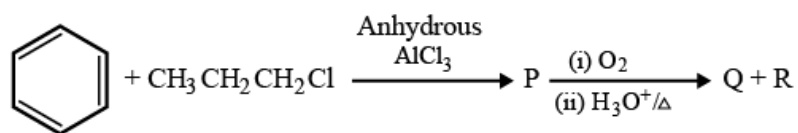
The type of isomerism shown by the complex $[\text{CoCl}_2(\text{en})_2]$ is

- A Linkage isomerism
- B Ionization isomerism
- C Coordination isomerism
- D Geometrical isomerism

Answer: D

Question 141

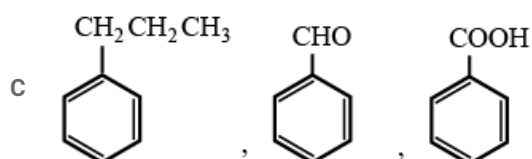
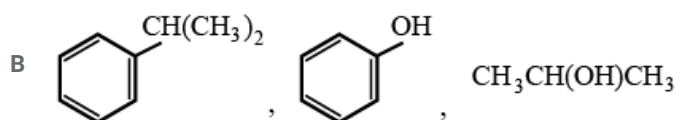
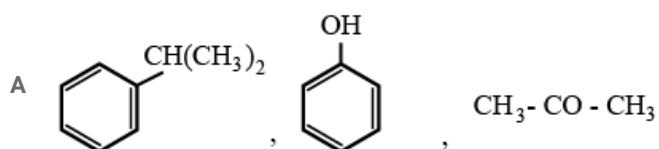
Identify the major products P, Q and R in the following sequence of reactions :

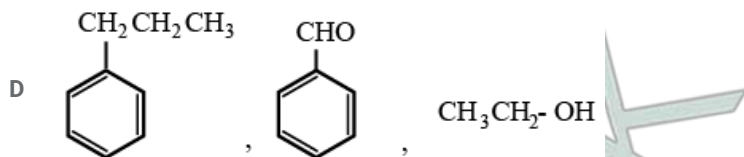


P

Q

R





Answer: A

Question 142

Which of the following compounds can form a zwitterion?

- A Glycine!
- B Benzoic acid
- C Acetanilide
- D Aniline

Answer: A

Question 143

For the redox reaction $\text{MnO}_4^- + \text{C}_2\text{O}_4^{2-} + \text{H}^+ \rightarrow \text{Mn}^{2+} + \text{CO}_2 + \text{H}_2\text{O}$ the correct coefficients of the reactants for the balanced equation are

- A $\text{MnO}_4^- - 5, \text{C}_2\text{O}_4^{2-} - 16, \text{H}^+ - 2$
- B $\text{MnO}_4^- - 2, \text{C}_2\text{O}_4^{2-} - 16, \text{H}^+ - 5$
- C $\text{MnO}_4^- - 2, \text{C}_2\text{O}_4^{2-} - 5, \text{H}^+ - 16$
- D $\text{MnO}_4^- - 16, \text{C}_2\text{O}_4^{2-} - 5, \text{H}^+ - 2$

Answer: C

Question 144

The correction factor 'a' to the ideal gas equation corresponds to

- A forces of attraction between the gas molecules
- B electric field present between the gas molecules
- C volume of the gas molecules
- D density of the gas molecules

Answer: A

Question 145

Which one of the following conditions will favour maximum formation of the product in the reaction, $\text{A}_2(\text{g}) + \text{B}_2(\text{g}) \rightleftharpoons \text{X}_2(\text{g})$ $\Delta H = -X \text{ kJ}$

- A High temperature and low pressure
- B High temperature and High pressure
- C Low temperature and low pressure
- D Low temperature and high pressure

Answer: D

Question 146

The bond dissociation energies of X_2 , Y_2 and XY are in the ratio of 1:0.5:1. ΔH for the formation of XY is -200 kJ mol^{-1} . The bond dissociation energy of X_2 will be

- A 400 kJ mol^{-1}
- B 800 kJ mol^{-1}
- C 100 kJ mol^{-1}
- D 200 kJ mol^{-1}

Answer: B

Question 147

When initial concentration of the reactant is doubled, the half-life period of a zero order reaction

- A remains unchanged
- B is tripled
- C is doubled
- D is halved

Answer: C

Question 148

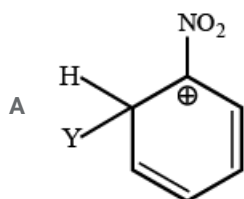
Which of the following molecules represents the order of hybridisation sp_2, sp_2, sp, sp from the left to right atoms?

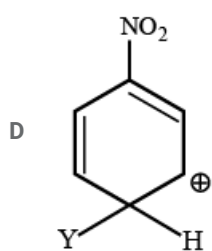
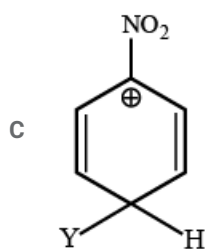
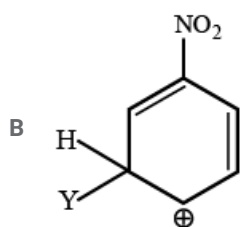
- A $CH_3-CH=CH-CH_3$
- B $CH_2=CH-CH=CH_2$
- C $CH_2=CH-C \equiv CH$
- D $HC \equiv C-C \equiv CH$

Answer: C

Question 149

Which of the following carbocations is expected to be most stable?





Answer: B

Question 150

Which of the following is correct with respect to -I effect of the substituents? (R = alkyl)



Answer: D

Question 151

The correct difference between first- and second-order reactions is that

A the rate of a first-order reaction does depend on reactant concentrations; the rate of a second-order reaction does not depend on reactant concentrations

B a first-order reaction can be catalyzed; a second-order reaction cannot be catalyzed

C the half-life of a first-order reaction does not depend on $[A]_0$ the half-life of a second-order reaction does depend on $[A]_0$

D the rate of a first-order reaction does not depend on reactant concentrations; the rate of a second-order reaction does depend on reactant concentrations

Answer: C

Question 152

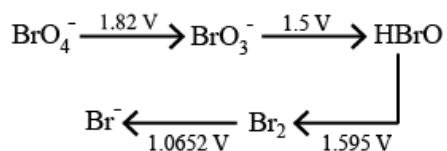
Among CaH_2, BeH_2, BaH_2 the order of ionic character is

- A $\text{BaH}_2 < \text{BeH}_2 < \text{CaH}_2$
- B $\text{BeH}_2 < \text{BaH}_2 < \text{CaH}_2$
- C $\text{CaH}_2 < \text{BeH}_2 < \text{BaH}_2$
- D $\text{BeH}_2 < \text{CaH}_2 < \text{BaH}_2$

Answer: D

Question 153

Consider the change in oxidation state of Bromine corresponding to different emf values as shown in the diagram below:



Then the species undergoing disproportionation is

- A HBrO
- B Br_2
- C BrO_4^-
- D BrO_3^-

Answer: A

Question 154

In which case is the number of molecules of water maximum ?

- A 10^{-3} mol of water
- B 0.00224 L of water vapours at 1 atm and 273 K
- C 0.18 g of water
- D 18 mL of water

Answer: D

Question 155

The compound A on treatment with Na gives B, and with PCl_5 gives C B and C react together to give diethyl ether. A, B and C are in the order

- A $\text{C}_2\text{H}_5\text{OH}, \text{C}_2\text{H}_5\text{ONa}, \text{C}_2\text{H}_5\text{Cl}$
- B $\text{C}_2\text{H}_5\text{Cl}, \text{C}_2\text{H}_6, \text{C}_2\text{H}_5\text{OH}$
- C $\text{C}_2\text{H}_5\text{OH}, \text{C}_2\text{H}_5\text{Cl}, \text{C}_2\text{H}_5\text{ONa}$
- D $\text{C}_2\text{H}_5\text{OH}, \text{C}_2\text{H}_6, \text{C}_2\text{H}_5\text{Cl}$

Answer: A

Question 156

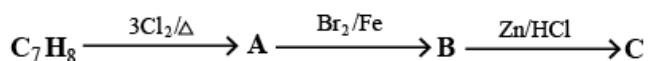
Hydrocarbon (A) reacts with bromine by substitution to form an alkyl bromide which by Wurtz reaction is converted to gaseous hydrocarbon containing less than four carbon atoms. (A) is

- A CH_4
- B $\text{CH}_3\text{-CH}_3$
- C $\text{CH}_2=\text{CH}_2$
- D $\text{CH} \equiv \text{CH}$

Answer: A

Question 157

The compound C_7H_8 undergoes the following reactions :



The product 'C' is

- A p-bromotoluene
- B 3-bromo-2,4,6-trichlorotoluene
- C o-bromotoluene
- D m-bromotoluene

Answer: D

Question 158

Which oxide of nitrogen is not a common pollutant introduced into the atmosphere both due to natural and human activity ?

- A NO
- B N_2O
- C NO_2
- D N_2O_5

Answer: D

Question 159

A mixture of 2:3 g formic acid and 4.5 g oxalic acid is aon with conic. H_2SO_4 The evolved mixture is passes through KOH pellets. Weight (in g) of the remaining product at STP will be

- A 4.4
- B 2.8
- C 3.0
- D 1.4

Answer: B

Question 160

The difference between amylose and amylopectin is

- A Amylose is made up of glucose and galactose
- B Amylopectin have 1 $\rightarrow 4$ α -linkage and 1 $\rightarrow 6$ β -linkage
- C Amylose have 1 $\rightarrow 4$ α -linkage and 1 $\rightarrow 6$ β -linkage
- D Amylopectin have 1 $\rightarrow 4$ α -linkage and 1 $\rightarrow 6$ α -linkage

Answer: D

Question 161

Which of the following oxides is most acidic in nature ?

- A CaO
- B BaO
- C BeO
- D MgO

Answer: C

Question 162

Nitration of aniline in strong acidic medium also gives m-nitroaniline because

- A In acidic (strong) medium aniline is present as anilinium ion.
- B In absence of substituents nitro group always goes to m-position.
- C In electrophilic substitution reactions amino group is meta directive.
- D In spite of substituents nitro group always goes to only m-position.

Answer: A

Question 163

Regarding cross-linked or network polymers, which of the following statements is incorrect ?

- A They contain strong covalent bonds in their polymer chains.
- B Examples are bakelite and melamine.
- C They are formed from bi- and tri-functional monomers.
- D They contain covalent bonds between various linear polymer chains.

Answer: A

Question 164

Following solutions were prepared by mixing different volumes of NaOH and HCl of different Concentration

- A $60 \text{ mL } \frac{1}{10} \text{ M HCl} + 40 \text{ mL } \frac{1}{10} \text{ M NaOH}$
- B $55 \text{ mL } \frac{1}{10} \text{ M HCl} + 45 \text{ mL } \frac{1}{10} \text{ M NaOH}$

- C $75 \text{ mL } \frac{1}{5} \text{ M HCl} + 25 \text{ mL } \frac{1}{5} \text{ M NaOH}$
- D $100 \text{ mL } \frac{1}{10} \text{ M HCl} + 100 \text{ mL } \frac{1}{10} \text{ M NaOH}$

Answer: A

Question 165

On which of the following properties does the coagulating power of an ion depend ?

- A The sign of charge on the ion alone
- B Both magnitude and sign of the charge on the ion
- C Size of the ion alone
- D Only magnitude of the charge on the ion alone

Answer: B

Question 166

The solubility of BaSO_4 in water is $2.42 \times 10^{-3} \text{ g L}^{-1}$ at 298K. The value of its solubility product (K_{sp}) will be

(Given molar mass of $\text{BaSO}_4 = 233 \text{ g mol}^{-1}$)

- A $1.08 \times 10^{-8} \text{ mol}^2 \text{ L}^{-2}$
- B $1.08 \times 10^{-14} \text{ mol}^2 \text{ L}^{-2}$
- C $1.08 \times 10^{-12} \text{ mol}^2 \text{ L}^{-2}$
- D $1.08 \times 10^{-10} \text{ mol}^2 \text{ L}^{-2}$

Answer: D

Question 167

Given van der Waals constant for NH_3 , H_2 , O_2 and CO_2 respectively 4.17, 0.244, 1.36 and 3.59, which 'one' of the following gases is most easily liquefied, ?

- A CO_2
- B O_2
- C H_2
- D NH_3

Answer: D

Question 168

Magnesium reacts with an element (X) to form an ionic compound. If the ground state electronic configuration of (X) is $1s^2 2s^2 2p^3$, the simplest formula for this compound is

- A Mg_3X_2
- B Mg_2X_3
- C MgX_2
- D Mg_2X_3

Answer: A

Question 169

Iron exhibits bcc structure at room temperature. Above 900°C , it transforms to fcc structure. The ratio of density of iron at room temperature to that at 900°C (assuming molar mass and atomic radii of iron remains constant with temperature) is

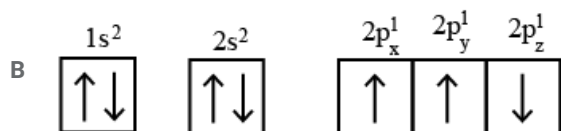
- A $\frac{1}{2}$
- B $\frac{3\sqrt{3}}{4\sqrt{2}}$
- C $\frac{4\sqrt{3}}{3\sqrt{2}}$
- D $\frac{\sqrt{3}}{\sqrt{2}}$

Answer: B

Question 170

Which one is a wrong statement?

- A The value of m for d_{z^2} is Zero



- C An orbital is described by three quantum numbers while an electron in an atom is designated by four quantum numbers.
- D Total orbital angular momentum of electron in s orbital is equal to zero

Answer: B

Question 171

Consider the following species
 $\text{CN}^+, \text{CN}^-, \text{NO}$ and CN

Which one of these will have the highest bond order?

- A CN
- B CN^+
- C CN^-
- D NO

Answer: C

Question 172

Which of the following statements is not true for halogens?

- A Chlorine has the highest electron-gain enthalpy.
- B All but fluorine show positive oxidation states.
- C All are oxidizing agents.
- D All form monobasic oxyacids.

Answer: B

Question 173

Which one of the following elements is unable to form $(MF_6)^{3-}$ ion ?

- A In
- B B
- C Al
- D Ga

Answer: B

Question 174

In the structure of ClF_3 the number of lone pairs of electrons on central atom 'Cl' is

- A three
- B four
- C two
- D one

Answer: C

Question 175

Considering Ellingham diagram, which of the following metals can be used to reduce alumina ?

- A Cu
- B Mg
- C Zn
- D Fe

Answer: B

Question 176

The correct order of atomic radii in group 13 elements is

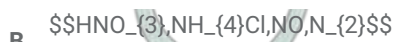
- A $B < Ga < Al < In < Tl$
- B $B < Ga < Al < Tl < In$
- C $B < Al < Ga < In < Tl$
- D $B < Al < In < Ga < Tl$

Answer: A

Question 177

The correct order of N-compounds in its decreasing order of oxidation states is

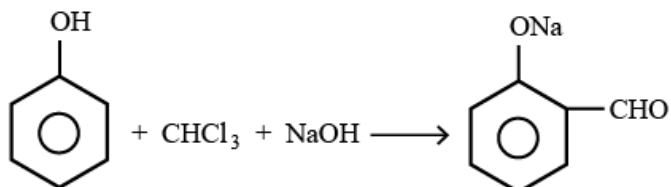
- A NH_4Cl, N_2, NO, HNO_3



Answer: D

Question 178

In the reaction



the electrophile involved is



B figure2

C figure3

D figure4

Answer: A

Question 179

Carboxylic acids have higher boiling points than aldehydes, ketones and even alcohols of comparable molecular mass. It is due to their

A formation of intermolecular H-bonding

B more extensive association of carboxylic acid via vander Walls force of attraction

C formation of carboxylate ion

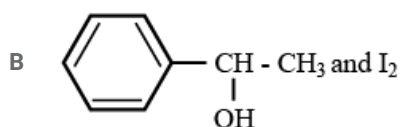
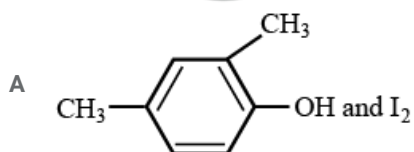
D formation of intramolecular H-bonding

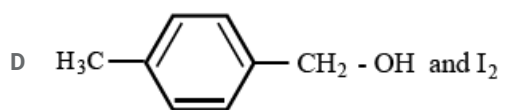
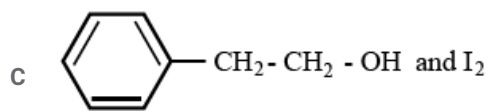
Answer: A

Question 180

Compound A, $\text{C}_8\text{H}_{10}\text{O}$, is found to react with NaOI (produced by reacting Y with NaOH) and yields a yellow precipitate with characteristic smell.

A and Y are respectively





Answer: B