Botany - Section A

1.

Identify the incorrect statement :

1. Heterotrophic bacteria are important decomposers

2. Diatoms are chief producers in the oceans

3. The pigments of Euglenoids are identical to those present in higher plants

4. Very few protozoans are autotrophs

2.

In a monohybrid cross F_1 progeny resemble neither of the parents. What would be true in this case?

1. The parental traits would not appear in any of the F_2 - progenies

2. The F_2 phenotypic ratio will be different from the F_2 genotypic ratio

3. It could be a case of incomplete dominance

4. The F_2 phenotypic ratio will be similar to any Mendelian monohybrid cross

3.

The enzyme that catalyzes the peptide bonding in prokaryotes is located in the:

1. Leader region of the mRNA

2. Central part of tRNA

3. Smaller subunit of the ribosome

4. Larger subunit of the ribosome

4.

Which of the following stages of Meiosis I of Prophase I is not correctly matched with events occurring during that stage?

	Stage	Event
1.	Zygotene	Pairing between homologous chromosomes
2.	Pachytene	Crossing over between sister chromatids of homologous chromosomes
3.	Diplotene	Tendency of recombined homologues to separate
4.	Diakinesis	Terminalization of chiasmata

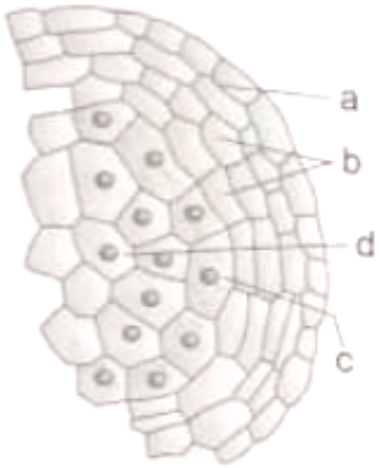
5.

Identify the biome that is not correctly matched with its mean annual temperature and mean annual precipitation:

	Biome	Mean annual temperature [^{0}C]	Mean annual precipitation [cm]
1.	Desert	0 – 25	25 – 100
2.	Temperate Forest	10 – 22	50 – 220
3.	Tropical forest	20 – 25	150 – 425
4.	Coniferous forest	0 – 15	50 – 250

6.

Examine the figure given below and select the right option giving all the four parts a,b,c and d. Correctly identify



	a	b	c	D
1.	Endothecium	Tapetum	Microspore mother cell	Middle layer
2.	Tapetum	Endothecium	Microspore mother cell	Middle layer
3.	Endothecium	Middle layer	Tapetum	Microspore mother cell
4.	Endothecium	Microspore mother cell	Middle layer	Tapetum

7.

It is unfortunate that in our society women are blamed for producing female children and have been ostracised and ill-treated because:
1. The sex is determined by the type of sperm fertilizing the egg

2. The sex is determined by the type of egg fertilizing the sperm

3. The sex is determined by the hormones produced by the fetus

4. The sex is determined by God's Will

8.

Parasites evolved special adaptations in accordance with their life styles. Choose odd one out w.r.t. these adaptations.
1. High reproductive capacity
2. Simple life cycle and complex morphological, anatomical features
3. Loss of unnecessary sense organs
4. Loss of digestive system

9.

In pteridophytes, gametophyte that develops in the homosporous species is usually
1. Monoecious and has events, precursor to the seed habit.
2. Dioecious and does not lead to seed habit.
3. Monoecious and does not lead to seed habit.
4. Dioecious and has events, precursor to the seed habit.

10.

Select the correct statement w.r.t. axoneme of eukaryotic flagella.
1. It is composed of 9 peripheral triplet microfibrils of tubulin proteins.
2. It does not have covering of plasma membrane.
3. Central tubules are enclosed by a central sheath.
4. It gives rise to spindle apparatus during cell division.

11.

Select the features which are common for both ER and Golgi apparatus.
(A) Both are sites for synthesis of lipids and steroidal hormones.
(B) Both are composed of cisternae, tubules and vesicles.
(C) Both are parts of endomembrane system.
(D) Both help in formation of plasma membrane during cytokinesis.

1. Only (B)

2. Only (B) and (C)

3. Only (A) and (D)

4. All except (D)

12.

In which phase of mitosis, chromosomes are moved to spindle equator and get aligned at equatorial plate through spindle fibers to both poles, is

1. Prophase

2. Metaphase

3. Anaphase

4. Telophase

13.

A free living aerobic soil bacterium capable of fixing nitrogen is
1. Azotobacter

2. Clostridium

3. Rhizobium

4. Streptococcus

14.

Consider the following statements and state True (T) contributes to global warming or False (F)

a. The Eastern Ghats have higher amphibian species diversity than the Western Ghats.

b. Habitat loss and fragmentation is the most important cause driving animals and plants to extinction.

c. Loss of biodiversity in a region may lead to lowered resistance to environmental perturbations.

d. In onsite conservation approaches, biodiversity at all levels is protected.
A B C D

1. F T T T
2. T F T T
3. F F T T
4. T T T F

15.

In mature pollen grain, vegetative cell differs from generative cell as the former
1. Floats in the cytoplasm of generative cell.
2. Is smaller in size.
3. Is spindle shaped with dense cytoplasm.
4. Have abundant food reserve and large nucleus

16.

In mycorrhiza association the fungal symbiont helpful in :
1. Phosphorus nutrition.
2. Resistance to root borne pathogen.
3. Tolerance to salinity and drought.
4. All the above.

17.

The region of part of root that increases the surface area for water absorption is

1. Root cap

2. Zone of elongation

3. Meristematic zone

4. Root hair

18.

If the initial amount of DNA is 8 C, then after S-phase the amount of DNA would be

1. 4 C
2. 8 C
3. 64 C
4. 16 C

19.

Which of the following are the functions of deoxyribonucleoside triphosphates?
i. Act as substrates
ii. Provide energy for polymerization reaction
iii. Act as enzyme
iv. To separate strands of DNA

1. i, ii, iii
2. ii, iv
3. i, ii
4. i, iii

20.

Sunlight is essential for photosynthesis is established by
1. Jan Ingenhousz.
2. Robert Hill.
3. Emerson.
4. Julius Von Sach.

21.

Read the following statements and choose the option which is true for them.
Statement-I : During conversion of succinic acid to fumaric acid in Krebs cycle, one molecule of FAD is synthesized.
Statement-II : There are three steps in the Krebs cycle where CO_2 is released.

1. Only statement I is correct.
2. Only statement II is correct.
3. Both the statements I and II are correct.
4. Both the statements I and II are incorrect.

22.

Epidermal hairs on stems known as trichomes

1. May sometimes be secretory in function
2. Have vascular supply
3. May be soft or stuff but unbrached always
4. Are endogenous in origin like lateral roots

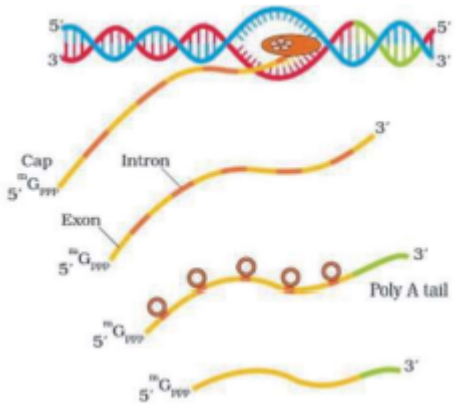
23.

Which of the following is wrongly matched in the given table?

	Microbe	Product	Application
(1)	Trichoderma polypore	Cyclosporin A	immuno-suppressive drug
(2)	Monascus purpureus	Statins	lowering of blood cholesterol
(3)	Streptococcus	Strepto-kinase	removal of clot from a blood vessel
(4)	Clostridium butylicum	Lipase	removal of oil stains

1. (1)
2. (2)
3. (3)
4. (4)

24.



Messenger RNA (m RNA)

Above given figure represents:-

1. Capping
2. Polyadenylation
3. Splicing
4. hnRNA processing

25.

Match the following :-

	Column A		Column B
(i)	Auxin	(a)	Brewing industry
(ii)	Gibbrelic Acid	(b)	Xylem differentiation
(iii)	Cytokinin	(c)	Fruit ripening
(iv)	Ethylene	(d)	Overcome Apical dominance

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

26.

Select the correct statement:-

1. Pue water has minimum $\psi\omega$
2. Pure water has maximum $\psi\omega$
3. Pure water has maximum DPD
4. Pure water has variable DPD

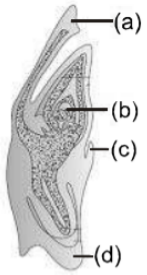
27.

Queen Victoria of England was :

1. Haemophilic carrier
2. Colour blind
3. AIDS patients
4. Deaf

28.

Given below a L.S. of an embryo of grass. Identify the labelled part (a), (b), (c) and (d) and select correct option about them :-



	(a)	(b)	(c)	(d)
1)	Coleoptile Shoot apex)	Colerhiza	Scutellum	
2)	Scutellum Coleorhiza	Shoot apex	Epiblast	
3)	Radicle Coleoptile	Root cap	Scutellum	
4)	Root cap Coleorhiza	Scutellum	Radicle	

1. 1
2. 2
3. 3
4. 4

29.

Select the incorrect statement.

1. Carotenoids protect the plant from excessive heat and prevent photo-oxidation of chlorophyll pigments

2. All pigments other than chlorophyll are called accessory pigments

3. The electrons removed from PS II are never replaced

4. Cyclic photophosphorylation occurs mostly in stroma lamellae membrane

30.

Choose the correct features regarding the most common asexual spores of sac fungi.

a. Haploid

b. Exogenous

c. Thick walled

d. Produced during unfavorable conditions

e. Grow in basipetal manner

1. a, c and d

2. a, b and c

3. b, c, d and e

4. All except c and d

31.

Degenerate, triplet, commaless, overlapping, universal in eukaryotes only

How many of the above features are associated with universal genetic code?

1. Five

2. Three

3. Four

4. Two

32.

Valvate aestivation in corolla is found in

1. Cotton

2. Calotropis

3. Cassia

4. Gulmohur

33.

The correctly written binomial epithet of Mango is

1. Mangifera indica linn

2. Mangifera indica Linn.

3. Mangifera Indica L

4. Mangifera indica L

34.

When (i) are used in respiration the RQ is (ii). Select the correct option for (i) and (ii) that make the sentence a correct sense.
1. (i) Carbohydrates, (ii) > 1
2. (i) Proteins, (ii) > 1
3. (i) Fats, (ii) < 1
4. (i) Malic acid, (ii) < 1

35.

A cell is placed in 0.4 M solution of sugar and no change in volume of cell is found. What is the concentration of the cell sap?

1. 40 M

2. 4 M

3. 0.4 M

4. 0.20 M

Botany - Section B

36.

Consider the following statements and select the option that correctly fill in the blanks.

A. _____ is used to induce the dormancy of buds and storage organs.

B. _____ speed up the malting process in brewing industry.

C. Senescence is prevented by _____.

	A	B	C
1.	Gibberellin	Cytokinin	GAs
2.	Ethylene	ABA	Cytokinin
3.	Cytokinin	Auxins	ABA
4.	ABA	GAs	Cytokinin

37.

The phytohormone, which was first isolated from human urine, shows
a. Bolting effect.
b. Apical dominance.
c. Control of xylem differentiation.
d. Promote leaf senescence.
e. Ripening of fruit.
f. Initiation of rooting is stem cuttings.

1. b, c and f

2. a, d and e

3. b, e and f

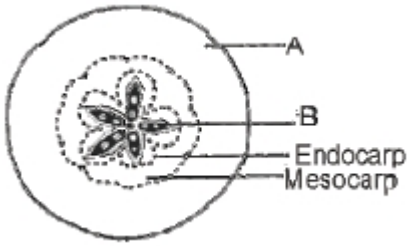
4. a, b and d

38.

Nucleolus is
1. Bounded by a single membrane.
2. Always one per cell.
3. Present inside mitochondria.
4. The site for rRNA synthesis.

39.

Look at the diagram given below and answer appropriately



(i) Since ___A___ is associated with fruit, it is called as ___(i)___ .
(ii) Since ___B___ is present, fruit cannot be called as ___(ii)___ .

1. A - Pericarp, (i) - True fruits
2. B - Seed, (ii) - Ex-albuminous
3. A - Thalamus, (i) - True fruit
4. B - Seed, (ii) - Parthenocarpic

40.

In nature, a given habitat has enough resources to support a maximum possible number, beyond which no further growth is possible. This characteristic feature of nature is known as

1. Biotic potential

2. Carrying capacity

3. Natural selection

4. Homeostasis

41.

See the given step that are related to plant breeding:

a. Selection and testing of hybrid

b. Selection of parents

c. Germplasm collection

d. Crossing among selected parents

e. Testing and release of new cultivars.

1. $b \rightarrow c \rightarrow d \rightarrow e \rightarrow a$

2. $c \rightarrow b \rightarrow d \rightarrow a \rightarrow e$

3. $c \rightarrow b \rightarrow a \rightarrow d \rightarrow e$

4. $a \rightarrow b \rightarrow c \rightarrow d \rightarrow e$

42.

Pathogens of Arthropods effectively used as biological control agents include

1. Trichoderma

2. Baculoviruses

3. Agrobacterium tumefaciens

4. E. Col

43.

What is the possible advantage if hybrids are made into apomicts?

1. Segregation of characters in the hybrid progeny

2. Farmers can keep on using the hybrid seeds to raise new crop in first year only

3. Absence of segregation in the hybrid progeny

4. More than one option is correct

44.

Development of a new individual from a single gamete without fusion with another gamete is called

1. Parthenocarpy

2. Sporophytic budding

3. Parthenogenesis

4. Polyembryony

45.

Choose the correct sequence of greenhouse gases with respect to their relative contribution to global warming in increasing order

1. N_2O, CFC, CH_4, CO_2

2. CFC, N_2O, CO_2, CH_4

3. CH_4, N_2O, CO_2, CFC

4. N_2O, CO_2, CH_4, CFC

46.

Select the correct statement about biodiversity :-

1. The desert areas of Rajasthan and Gujarat have a very high level of desert animal species as well as numerous rare animals.

2. Large scale planting of Bt cotton has no adverse effect on biodiversity.

3. Western Ghats have a very high degree of species richness and endemism.

4. Conservation of biodiversity is just a fad pursued by the developed countries.

47.

What steps should be taken before the disposal of nuclear waste?

1. Nuclear waste should be pre-treated

2. It should be stored in shielded containers

3. It should be buried about 500 m deep within the rock

4. All of the above

48.

Life cycles of Ectocarpus and Polysiphonia are

1. Haplontic and Diplontic respectively

2. Diplontic and Haplontic respectively

3. Haplodiplontic

4. Diplontic and Haplodiplontic respectively

49.

In grassland ecosystem the pyramid of biomass and energy will be __A__ and __B__ respectively.

Choose the correct option to fill the blanks A and B.

	A	B
1.	Upright	Upright
2.	Upright	Inverted
3.	Inverted	Upright
4.	Inverted	Inverted

50.

Select the **correct** match

1. Imperfect fungi – *Ustilago*

2. *Agaricus* – Club fungus

3. Toadstool – Edible mushroom

4. Smut of wheat – *Puccinia graminis*

Zoology - Section A

51.

ACTH controls the secretion of:
1. cortisol
2. aldosterone
3. epinephrine
4 testosterone

52.

Which one of the following statements is incorrect about menstrual cycle ?

1. The first menstruation begins at puberty and is called menarche

2. Lack of menstruation may also occur due to some environmental factors like stress, poor health

3. Corpus luteum secretes large amounts of progesterone which is essential for maintenance of endometrium

4. In absence of fertilisation, corpus luteum degenerates in luteal phase and new follicles start developing immediately

53.

What level of protein organization structure explains the 3-D shape of an enzyme?

(1) primary structure

(2) tertiary structure

(3) secondary structure

(4) quaternary structure

54.

A selectable marker is used to

1. help in eliminating the non- transformants, so that the transformants can be regenerated

2. identify the gene for a desired trait in an alien organism

3. select a suitable vector for transformation in a specific crop

4. mark a gene on a chromosome for isolation using restriction enzyme

55.

Which of the following structure is associated with locomotion ?
(i) Parapodia.
(ii) Water vascular system.
(iii) Radula.
(iv) Proboscis.

1. (i), (ii), (iii), (iv)

2. (i) only

3. (i), (ii) only

4. (i), (iii) only

56.

Congestive heart failure is often linked to

1. Congestion of lungs which commonly occur in asthmatics and smokers.

2. Damage of heart muscles by an inadequate blood supply.

3. Deposition of calcium, fat, cholesterol and fibrous tissues in the coronary arteries.

4. Blockage of AVN.

57.

Antitoxin consists of

1. Antibodies

2. Toxoid

3. Antibiotics

4. Live attenuated pathogen

58.

Select the incorrect statement

1. Na^+/K^+ ATPase is an electrogenic pump that helps to maintain electrochemical ionic gradient across axolemma

2. At rest, axoplasm has lower Na^+ ions concentration than K^+ ion concentration

3. Brain stem comprises midbrain, pons and medulla oblongata

4. Thalamus part of hindbrain is responsible for emotions like anger and rage

59.

Select the two core techniques that enabled birth of modern biotechnology.

1. Genetic engineering and bioprocess engineering

2. Genetic engineering and biolistics

3. Chemical engineering and biopiracy

4. Downstream processing and bioprocess engineering

60.

The majority of water and salt filtered into Bowman's capsule is reabsorbed by

1. the brush border of the transport epithelia of the proximal tubule

2. diffusion from the descending limb of the loop of Henle into the hypertonic interstitial fluid of the medulla

3. active transport across the transport epithelium of the thick upper segment of the ascending limb of the loop of Henle

4. selective secretion and diffusion across the distal tubule

61.

Which of these sequences describes the correct path for light rays entering the human eye?

1. sclera, retina, choroid, lens, cornea

2. fovea centralis, pupil, aqueous humor, lens

3. cornea, pupil, lens, vitreous humor, retina

4. cornea, fovea centralis, lens, choroid, rods

62.

Odd one out in given barrier method of contraception

1. Nirodh

2. Diaphragm

3. Vaults

4. Cervical cap

63.

The parts of nephron situated in cortical region of kidney are

1. Loop of Henle, PCT, and collecting duct

2. Collecting duct, PCT, and malpighian corpuscle

3. PCT, DCT, and Loop of Henle

4. PCT, DCT and Malpighian corpuscle

64.

Transgenic animals are those which have

1. Foreign DNA in some of its cells

2. Foreign DNA in all its cells

3. Foreign RNA in all its cells

4. DNA and RNA both in the cells

65.

Level of estrogen and progesterone are minimum at the time of
1. Follicular phase.
2. Ovulation.
3. Secretory phase.
4. Onset of menstrual phase.

66.

Match the column I with column II :-

Column-I	Column-II
(i) Vomiting	(a) Inadequate enzyme secretion
(ii) Diarrhoea	(b) Irregular bowel movement
(iii) Constipation	(c) Increased liquidity of faecal discharge
(iv) Indigestion	(d) A feeling of nausea

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

67.

In the rest state, a subunit of troponin masks :-

1. Active binding sites for actin on the myosin filaments.

2. Active binding sites for myosin on the myosin filaments.

3. Active binding sites for myosin on the actin filaments.

4. Actine binding sites for actin on the actin filaments.

68.

In biotechnology transgenic animals are used for
I. Study of disease.
II. To obtained human protein.
III. Vaccine safety for humans.
IV. To know the carcinogenicity of any chemicals.

1. I, II, III and IV
2. III and IV only
3. I, III and IV
4. I and II only

69.

Which of the following is incorrect with respect to parathyroid hormone (PTH)?

1. Secretion of PTH is regulated by circulating levels of calcium ions
2. PTH acts on bones and stimulates the process of bone mineralisation
3. PTH stimulates reabsorption of Ca^{+2} by renal tubules
4. PTH increases absorption of Ca^{+2} from digested food

70.

Five events in the transmission of nerve impulse across the synapse are given–

A. Opening of specific ion channels allows the entry of ions, a new action potential is generated in the post synaptic neuron.

B. Neurotransmitter binds to the receptor on post synaptic membrane

C. Synaptic vesicle fuses with pre-synaptic membrane, neurotransmitter releases into synaptic cleft

D. Depolarization of pre-synaptic membrane

E. Arrival of action potential at axon terminal.

In which sequence do these events occur?

1. $E \rightarrow D \rightarrow C \rightarrow B \rightarrow A$
2. $A \rightarrow B \rightarrow C \rightarrow D \rightarrow E$
3. $A \rightarrow B \rightarrow D \rightarrow C \rightarrow E$
4. $E \rightarrow D \rightarrow C \rightarrow A \rightarrow B$

71.

Select the incorrect statement

1. The columnar epithelium is present in the stomach and intestine

2. Cilia move the particle in a specific direction

3. Cilia are present in fallopian tube and bronchioles

4. In PCT simple squamous epithelium is present

72.

Why the partial pressure of CO_2 is high at tissue-site?

1. Due to the saturation of O_2 with Hb

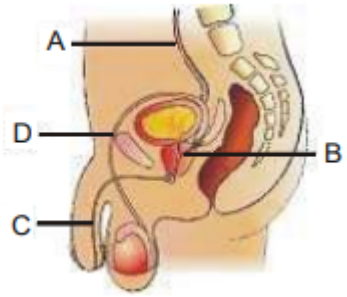
2. Release of H^+ at the tissue site

3. Due to metabolism

4. Due to the dissociation of HbO_2

73.

It is a diagrammatic sectional view of male reproductive system, in which identify the ejaculatory duct:-



1. A
2. B
3. D
4. C

74.

Match the Column-l and Column-ll and select the correct option?

Column l	**Column ll**
a. Tetany	i) Paralysis of skeletal muscle
b. Muscular dystrophy	ii) Inflammation of joints
c. Arthritis	iii) Degeneration of skeletal muscles
d. Myasthenia gravis	iv) Rapid spasm in muscle

1. b-i, a-ii, c-iii, d-iv
2. a-iv, b-iii, c-ii, d-i
3. d-iii, b-ii, c-i, a-iv
4. a-iv, c-ii, b-i, d-iii

75.

Correct flow water current in sponges is:-

1. Ostia →Osculum→Spongocoel→Outside
2. Osculum→Spongocoel→Ostia→Outside
3. Ostia→Spongocoel→Osculum→Outside
4. Osculum→Ostia→Spongocoel→Outside

76.

lncreasing osmolarity towards the inner medullary interstitium is mainly caused by :-

1. NaCl and uric acid
2. DCT and collecting duct
3. PCT and vasa recta
4. NaCl and urea

77.

Dwarfism, pot belly and deaf-mutism are seen in which disease ?

1. Myxoedema
2. Cretinism
3. Grave's disease
4. Basedow's disease

78.

The disease in which the pathogenic infection produces hemozoin granules resulting in high fever in the body is

1. Filariasis
2. Ascariasis
3. Amoebiasis
4. Malaria

79.

False statement about ‘Amniocentesis’ is

1. Foetal sex determination test based on the chromosomal pattern of cells in amniotic fluid surrounding the developing embryo
2. Amniotic fluid is withdrawn for analyzing fetal cells and dissolved substances
3. It can reveal genetic diseases, chromosomal abnormalities, and metabolic disorders
4. It can help the physician to test the fetus for eye color and cleft palate

80.

During ECG of a healthy person, P-wave represents

1. Ventricular depolarisation
2. Ventricular repolarisation
3. Joint diastole
4. Atrial depolarisation

81.

Correct sequence of layers of wall of gut from inside to outside is

1. Mucosa→Muscularis →Submucosa→Serosa
2. Mucosa→Submucosa→Muscularis→Serosa
3. Submucosa→Mucosa→Muscularis→Serosa
4. Submucosa→Muscularis→Mucosa→Serosa

82.

A poikilotherm having four-chambered heart is

1. Columba
2. Chameleon
3. Crocodilus
4. Canis

83.

The most abundant type of loose connective tissue is

1. Areolar tissue
2. Cartilage
3. Tendon
4. Bone

84.

Which one of the following is **incorrect** w.r.t pulmonary volumes?

1. VC = ERV + IC
2. FRC = RV + EC
3. TLC = IC + FRC
4. IC = TV + IRV

85.

Ricin and abrin are

1. Alkaloids
2. Toxins
3. Lectins
4. Pigments

Zoology - Section B

86.

Which type of natural selection is illustrated by industrial melanism?

1. Directional selection
2. Balancing selection
3. Disruptive selection
4. stabilising selection

87.

Stanley Miller had put the Oparin-Haldane theory to test in 1953 by creating in the laboratory, the probable conditions on the primitive earth. In the experiment simple amino acids were synthesized from which of the following mixtures, as observed after eighteen days?

1. $H_2,\ O_2,\ N_2$ and H_2O
2. $CH_4,\ CN,\ H$ and O_2
3. $H_2,\ NH_3,\ CH_4$ and water vapour
4. $NH_3,\ CH_4$ and O_2

88.

Match Column - I with Column - II and choose the correct option

Column - I	Column - II
a.A vector of disease	(i) Bombyx
b.A gregarious pest	(ii) Limulus
c.A living fossil	(iii) Locusta
d.An economically important	(iv) Culex insect

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

89.

Natural selection in which more individuals acquire peripheral character value at both the ends of the distribution curve is

1. Stabilising natural selection
2. Disruptive natural selection
3. Directional natural selection
4. The curve never shows the formation of two peaks

90.

Nucleotide is made up of

1. Heterocyclic compound, Monosaccharide, Phosphoric acid.
2. Nitrogenous base, hexose sugar, phosphate.
3. Hetrocylic compound and pentose sugar only.
4. Hetrocyclic compound and nucleoside.

91.

Which of the following option gives correct categorization of hormones according to their chemical nature:-

	A Steroid	B Amino-acid derivative	C Iodothyromines
1.	Epinephrine, nor-epinephrine	Estradiol, progesterone	Thyroxine
2.	Estradiol, progesterone	Epinephrine, nor-epinephrine	Thyroxine
3.	Estradiol, epinephrine	Nor-epinephrine progesterone	Thyroxine
4.	Estradiaol, pogesterone	Thyroxine	Epinephrine, nor-epinephrine

92.

The correct statement about the nature of evolution and natural selection is

(1) Evolution is a process while natural selection is the end result of a process which is unknown.

(2) Natural selection is a process while evolution is the end result of a process which is unknown.

(3) Both evolution and natural selection are the end results of a process which is unknown.

(4) It is still unclear whether evolution and natural selection are process or end results of unknown processes.

93.

Which of the following drugs are used in the treatment of allergy and quickly reduce the symptoms of allergy?

A Antihistamines

B Adrenaline

C Steroids

D Chloroquine

1 A only

2 A & B

3 A, B & C

4 A, B, C & D

94.

Selection of recombinants is based on all except one. Find out the exception

(1) Expression and non-expression of genes encoding for tetracycline-resistant compound

(2) Expression and non-expression of genes encoding for insulin-resistant compound

(3) Expression and non-expression of genes encoding for ampicillin-resistant compound

(4) Insertional inactivation

95.

Which of the following complication is/are not related with STDs?

a. Pelvic inflammatory diseases

b. Still births

c. Ectopic pregnancies

d. Erythroblastosis foetalis

1. a & b

2. a, b & c

3. d only

4. c & d

96.

Which of the following is an incorrect statement about inbreeding?

1. It is necessary to develop pure lines in any animal

2. It exposes recessive genes

3. It helps in accumulation of superior genes and elimination of less desirable genes

4. It increases heterozygosity

97.

The point of most distinct vision in case of human eye has a high number of cone cells. This point is known as

1. Blind spot

2. Macula lutea

3. Fovea centralis

4. Limbus

98.

Which of the following includes non-muscular movement?

(a) Protoplasmic streaming

(b) Pseudopodial movements

(c) Flagellar movements

(d) Ciliary movement

1. (a) and (b)

2. (a), (c) and (d)

3. (a), (b), (c) (d)

4. (c) and (d)

99.

Respiration in Balaenoptera takes place by :-

1. Gills

2. Skin

3. Trachea

4. Lungs

100.

What induces the completion of the meiotic division of the secondary oocyte?

1. Contact of the sperm with the zona pellucida layer of ovum

2. Entry of the sperm into the cytoplasm of the ovum through the zona pellucida and the plasma membrane

3. Fast block to polyspermy

4. Release of sperms by the penis into the vagina of female

Chemistry - Section A

101.

Correct increasing order of density is:

1. Li<K<Na<Rb<Cs

2. Li<Na<K<Rb<Cs

3. Cs<Rb<K<Na<Li

4. K<Li<Na<Rb<Cs

102.

$[Cr(H_2O)_6Cl_3$ (at. no. of Cr=24) has a magnetic moment of 3.83 BM, the correct distribution of 3d electrons in the chromium of the complex is

1. $3d^1_{xy}, 3d^1_{yz}, 3d^1_{z^2}$

2. $3d_{(x^2-y^2)}, 3d^1_{z^2}, 3d^1_{xz}$

3. $3d_{xy}, 3d_{(x^2-y^2)}, 3d^1_{yz}$

4. $3d^1_{xy}, 3d^1_{yz}, 3d^1_{zx}$

103.

Which has highest bond energy ?

1. CO

2. CO^+

3. N_2

4. N_2^+

104.

The relative lowering of vapour caused by dissolving 71.3g of a substance in 1000g of water is 7.13×10^{-3}. The molecular mass of substance is:-

1. 180

2. 18

3. 1.8

4. 360

105.

IUPAC name of $H_2[PtCl_6]$ is:

1. hydrogen hexachloroplatinate (IV)

2. dihydrogen hexachloroplatinate (IV)

3. hydrogen hexachloroplatinic (IV) acid

4. hexachloroplatinic (IV) acid

106.

Enthalpy change when 1.00 g water is frozen at $0^\circ C$, is :

$\left(\Delta H_{fus} = 1.435\ kcal\ mol^{-1}\right)$

1. 0.0797 kcal

2. -0.0797 kcal

3. 1.435 kcal

4. -1.435 kcal

107.

Ionic mobility of which of the following alkali metal ions is lowest when aqueous solution of their salts are put under an electric field?

1. K

2. Rb

3. Li

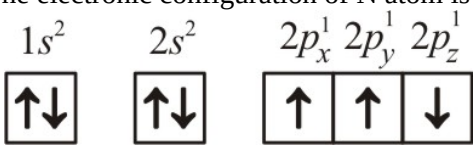
4. Na

108.
Which one is the wrong statement?

1. Total orbital angular momentum of an electron in 's' orbital is equal to zero.

2. An orbital is designated by three quantum numbers while an electron in an atom is designated by four quantum numbers.

3. The electronic configuration of N atom is



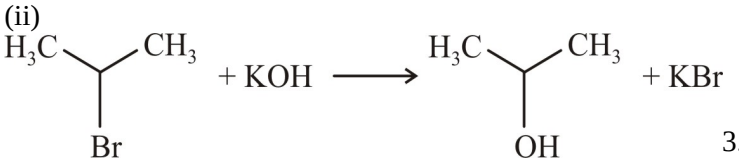
4. The value of m for d_{z^2} is zero.

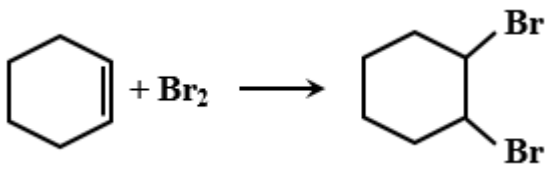
109.

For the following reactions,

(i) $CH_3CH_2CH_2Br + KOH \rightarrow CH_3CH{=}CH_2 + KBr + H_2O$

(ii)





(iii)

Which of the following statements is correct?

1. (i) Elimination, reaction, (ii) is substitution and (iii) is addition reaction
2. (i) Elimination, (ii) and (iii) are substitution reactions
3. (i) Substitution, (ii) and (iii) are addition reactions
4. (i) and (ii) are elimination reactions and (iii) is addition reaction

110.
If the value of an equilibrium constant for a particular reaction is 1.6×10^{12}, then at equilibrium the system will contain

1. All reactants

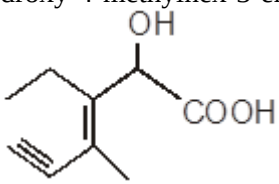
2. Mostly reactants

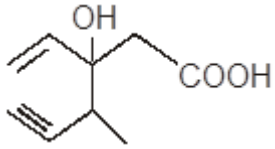
3. Mostly products

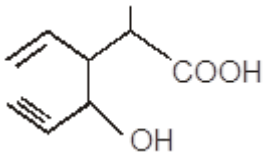
4. Similar amounts of reactants and products

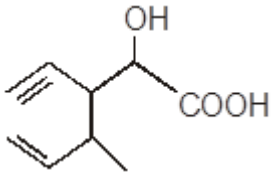
111.

Structure of the compound whose IUPAC name is 3-Ethyl-2-hydroxy-4-methylhex-3-en-5-ynoic acid is :

1. 

2. 

3. 

4. 

112.
At 25 ºC molar conductance of 0.1 molar aqueous solution of ammonium hydroxide is 9.54 $ohm^{-1}cm^2\ mol^{-1}$ and at infinite dilution, its molar conductance is 238 $ohm^{-1}\ cm^2\ mol^{-1}$. The degree of ionization of ammonium hydroxide at the same concentration and temperature is :

1. 20.800%

2. 4.008%

3. 40.800%

4. 2.080%

113.
Which of the following is electron-deficient?

1. $(SiH_3)_2$

2. $(BH_3)_2$

3. PH_3

4. $(CH_3)_2$

114.

Which one of the following is not a reducing sugar?

1. Glucose

2. Fructose

3. Lactose

4. Sucrose

115.

Among the following gases which one is damaging the ozone layer?

1. CFCs

2. CO_2

3. CH_4

4. SO_2

116.

Which of the following carbonyl compounds is most reactive towards nucleophilic addition reaction?

1. Benzaldehyde

2. p-Tolualdehyde

3. p-Nitrobenzaldehyde

4. Acetophenone

117.

Equivalent weight of FeS_2 in the half reaction, $FeS_2 \rightarrow Fe_2O_3 + SO_2$ is :

1. M/10

2. M/11

3. M/6

4. M/1

118.

When $SnCl_2$ reacts with $HgCl_2$, the product formed is:

1. $Sn + HgCl_4$

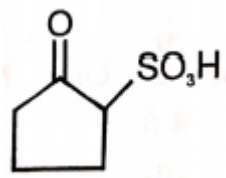
2. $Sn + Cl_2 + Hg_2Cl_2$

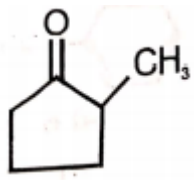
3. $SnCl_4$ and Hg_2Cl_2

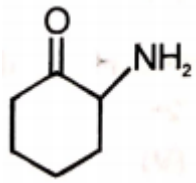
4. None of these

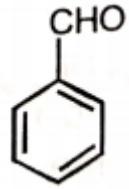
119.

Wolf Kishner reduction cannot be used in which of the following?

1. 

2. 

3. 

4. 

120.

The volume occupied by 1.8 g of water vapour at 374°C and 1 bar pressure will be - [Use R=0.083 bar LK^{-1} mol^{-1}]

1. 96.66 L
2. 55.87 L
3. 3.10 L
4. 5.31 L

121.

When calcium carbide is treated with heavy water, the product formed is

1. $Ca(OH)_2$
2. C_2D_2
3. D_2O_2
4. CaD_2

122.

Which of the following will not form a yellow precipitate on heating with an alkaline solution of iodine?

1. $CH_3CH(OH)CH_3$
2. $CH_3CH_2CH(OH)CH_3$
3. CH_3OH
4. CH_3CH_2OH

123.

The mass of carbon present in 0.5 mole of $K_4[Fe(CN)_6]$ is

(1) 1.8 g
(2) 18 g
(3) 3.6 g
(4) 36 g

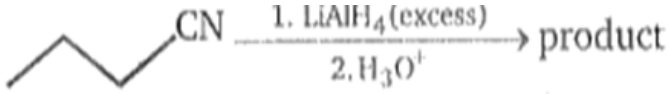
124.

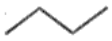
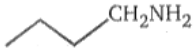
For the cell, $Ti/Ti^+(0.001M)||Cu^{2+}(0.1M)|Cu$, E_{cell} at 25°C is 0.83 V. E_{cell} can be increased:

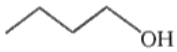
(1) By increasing $[Cu^{2+}]$
(2) By increasing $[Ti^+]$
(3) By decreasing $[Cu^{2+}]$
(4) None of these

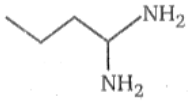
125.

Choose the appropriate product for this reaction.



1. 
2. 

3. 

4. 

126.

Which of the following is the anhydride of $HClO_4$?

1. Cl_2O
2. ClO_2
3. Cl_2O_7
4. Cl_2O_6

127.

The least bond angle is possessed by

1. H_2O
2. NH_3
3. CH_4
4. CO_2

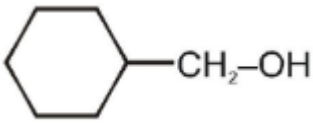
128.

The alcohol which reacts with conc. HCl /anhydrous $ZnCl_2$ to form alkyl halide at room temperature is :-

1. $CH_3 - CH_2 - OH$

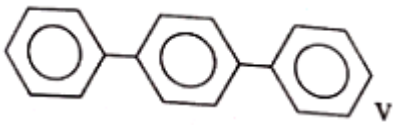
2. $Ph - CH_2 - CH_2 - OH$

3. $Ph - \underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}} - OH$

4. 

129.

The correct IUPAC name of the compound is



1. p-Phenyl diphenyl

2. p-1-biphenyl benzene

3. 1,1',4',1''-terphenyl

4. Terphenyl

130.

Identify the reagent from the following list which can easily distinguish between 1-butyne and 2-butyne?

1. Bromine, CCl_4

2. H_2 , Lindlar catalyst

3. Dilute H_2SO_4, $HgSO_4$

4. Ammoniacal cuprous chloride

131.

When 0.1 mole of CH_3NH_2 (ionization constant $K_b = 5 \times 10^{-4}$) is mixed with 0.08 mol HCl and the volume is made up of 1 litre. Find the $[H^+]$ of resulting solution.

1. 8×10^{-2}

2. 2×10^{-11}

3. 1.23×10^{-4}

4. 8×10^{-11}

132.

Assume each reaction is carried out in an open container, For which reaction $\Delta H = \Delta U$?

1. $PCl_3(g) \rightarrow PCl_3(g) + Cl_2(g)$

2. $2\,CO(g) + O_2(g) \rightarrow 2\,CO_2(g)$

3. $H_2(g) + Br_2(g) \rightarrow 2\,HBr(g)$

4. $C(s) + 2H_2O(g) \rightarrow 2H_2(g) + CO_2(g)$

133.

C-X bond is strongest in

1. $CH_3\,Br$

2. $CH_3\,Cl$

3. $CH_3\,I$

4. $CH_3\,F$

134.

What is the rate equation for reaction 2A+ B $\rightarrow$ C if the order of the reaction is zero ?

1. $k\,[A]^0\,[B]^0$

2. $k\,[A]^1[B]^0$

3. $k\,[A]^1[B]^1$

4. None of these

135.

General electronic configuration of actinoids is $(n-2)f^{1-14}\ (n-1)d^{0-2}ns^2$. Which of the following actinoids does not have one electron in 6d orbital?

1. U (Atomic number. 92)

2. Np (Atomic number. 93)

3. Pu (Atomic number. 94)

4. Cm (Atomic number. 96)

Chemistry - Section B

136.

The density of KCl is 1.9893 g cm^{-3} and the length of a side unit cell is 6.29082 Å as

determined by X-ray diffraction. The value of Avogadro's number calculated from these

data is:-

1. 6.017 x 10^{23}

2. 6.023 x 10^{23}

3. 6.03 x 10^{23}

4. 6.017 x 10^{19}

137.

For A+B $\rightarrow$C+D, ΔH = -20 $kJmol^{-1}$ the activation energy of the forward reaction is 85 kJ mol^{-1}. The activation energy for backward reaction is..... kJ mol^{-1}

1. 105

2. 85

3. 40

4. 65

138.

A solution containing 6.8 g of a non ionic solute in 100 g of water was found to freeze at $-0.93^o\ C$. The freezing point depression constant of water is 1.86. Calculate the molecular weight of the solute

1. 13.6

2. 34

3. 68

4. 136

139.

Which bond is expected to be the least polar?

1. O-F

2. P-F

3. Si-N

4. B-F

140.

During electro-osmosis of $Fe(OH)_3$ sol

1. Sol particles move towards the anode

2. Sol particles move towards the cathode of a sol

3. Higher is the gold number, greater will be the protective power of a lyophilic colloid

4. The dispersion medium moves towards the anode

141.

The lanthanide compound which is used as a most powerful liquid laser after dissolving in selenium oxychloride is

1. Cerium oxide

2. Neodymium oxide

3. Promethium sulfate

4. Cerium sulfate

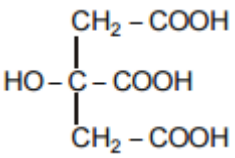
142.

Compound (*A*) $C_5H_{10}O$ forms a phenyl hydrazone and gives negative Tollen's and iodoform tests. Compound (*A*) on reduction gives *n*-pentane. Compound (*A*) is:

1. A primary alcohol
2. An aldehyde
3. A ketone
4. A secondary alcohol

143.

The IUPAC name of the following compound is :-



1. Citric acid
2. 3-Hydroxy pentane-1,5-dioic acid
3. 2-Hydroxy propane-1,2,3-tricarboxylic acid
4. 2-Carboxy-2-hydroxy propane-1,3-dicarboxylic acid

144.

For a tetrahedral complex $[MCl_4]^{2-}$, the spin-only magnetic moment is 3.83 B.M. The element M is

1. Co
2. Cu
3. Mn
4. Fe

145.

Extraction for zinc from zinc blende is achieved by:

1. Electrolytic reduction
2. Roasting followed by reduction with carbon
3. Roasting followed by reduction with another metal
4. Roasting followed by self-reduction

146.

Which of the following is an elastomer?

1. Dacron
2. Melamine
3. Vulcanized rubber
4. Polystyrene

147.

The artificial sweetner stable at cooking temperature and does not provide calories is-

(1) Saccharin

(2) Aspartame

(3) Sucralose

(4) Alitame

148.

The major product(S) in the below reaction is

$$H_3C-CH=CH_2 \xrightarrow[HBr]{(Ph-CO-O)_2} S$$

1. $\underset{1-\text{Bromopropane}}{H_3C-CH_2-CH_2Br}$

2. $\underset{2-\text{Bromopropane}}{CH_3-\underset{\underset{Br}{|}}{CH}-CH_3}$

3. $\underset{\text{Propene}}{CH_3-CH=CH_2}$

4. None

149.

Which of the following are Lewis acids?

(i) BF_3 (ii) H_2O (iii) H^+ (iv) AlF_3

1. Only (i)

2. (i) and (ii)

3. (i) , (iii) and (iv)

4. All of the above

150.

Match the items of Columns I and II and mark the correct option.

Column I	Column II
A. H_2SO_4	1. Highest electron gain enthalpy
B. CCl_3NO_2	2. Chalcogen
C. Cl_2	3. Tear gas
D. Sulphur	4. Storage batteries

Codes

	A	B	C	D
(1)	4	3	1	2
(2)	3	4	1	2
(3)	4	1	2	3
(4)	2	1	3	4

Physics - Section A

151.

In an ideal parallel LC circuit, the capacitor is charged by connecting it to a dc source which is then disconnected. The current in the circuit :-
1. becomes zero instantaneously.
2. grows monotonically.
3. decays monotonically.
4. oscillates instantaneously.

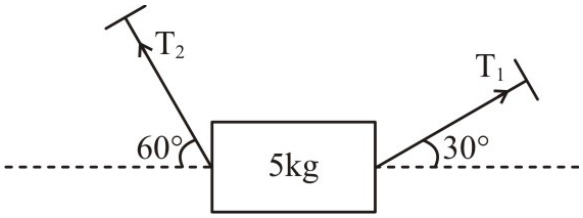
152.

At ordinary temperatures, the molecules of a diatomic gas have only translational and rotational kinetic energies. At high temperatures, they may also have vibrational energy. As a result of this compared to lower temperatures, a diatomic gas at higher temperatures will have–

1. lower molar heat capacity.
2. higher molar heat capacity.
3. lower isothermal compressibility.
4. higher isothermal compressibility.

153.

A body of mass 5 kg is suspended by the strings making angles 60° and 30° with the horizontal



(a) $T_1 = 25$ N (b) $T_2 = 25$ N

(c) $T_1 = 25\sqrt{3}$ N (d) $T_2 = 25\sqrt{3}$ N

1. a,b

2. a,d

3. c,d

4. b,c

154.

The current sensitivity of a moving coil galvanometer will be high if its (N = number of turns, B = magnetic field, A = area of coil, and C = Torsional constant of spring)

1. N is small

2. B is small

3. A is small

4. C is small

155.

In an electromagnetic wave, if at a point, at an instant, electric field is along +y axis and magnetic field is along +z axis, then the direction of propagation of the wave must be

1. +x axis

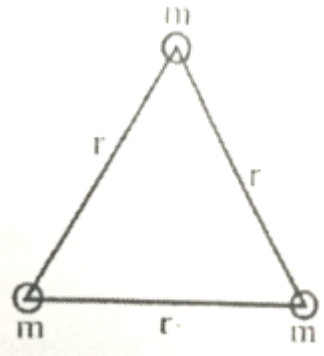
2. -x axis

3. -y axis

4. Both 1 & 2 are possible

156.

Three equal mass (m) are placed at vertex of an equilateral triangle of side r . Work required to double the separation between masses will be :-



1. $\frac{Gm^2}{r}$

2. $\frac{3Gm^2}{r}$

3. $\frac{3}{2}\frac{Gm^2}{r}$

4. None

157.

A solid sphere with a velocity (of the centre of mass) v and angular velocity ω is gently placed on a rough horizontal surface. The frictional force on the sphere:

1. must be forward (in direction of v)

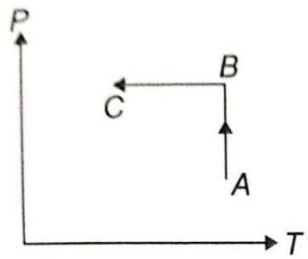
2. must be backward (opposite to v)

3. cannot be zero

4. None of these

158.

An ideal gas is taken through the process shown in the figure:



1. In process AB, work done by the system is positive.

2. In process AB, heat is rejected out of the system.

3. In process AB, internal energy increases.

4. In process AB, internal energy decreases and in process BC internal energy increases.

159.

A man grows into a giant such that his linear dimensions increase by a factor of 9. Assuming that his density remains the same, the stress in the leg will change by a factor of:

1. $\frac{1}{81}$

2. 9

3. $\frac{1}{9}$

4. 81

160.

When a negative charge is released and moves in the electric field, it moves toward a position of

1. lower electric potential and lower potential energy
2. lower electric potential and higher potential energy
3. higher electric potential and lower potential energy
4. higher electric potential and higher potential energy

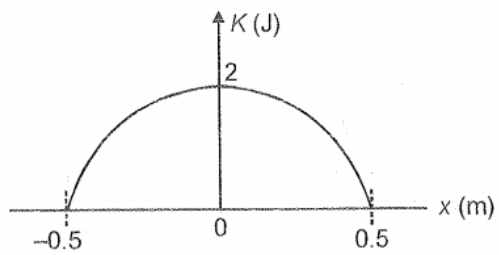
161.

In an AC circuit, alternating voltage $e = 200\sqrt{2}\sin 100t$ Volt is connected to a capacitor of capacity $1\mu F$. The rms value of the current in the circuit is:

1. 100 mA
2. 200 mA
3. 20 mA
4. 10 mA

162.

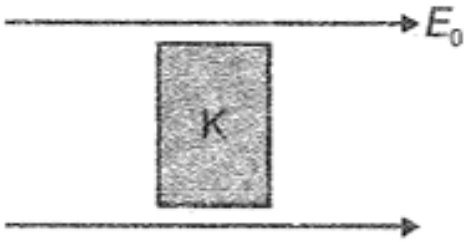
The kinetic energy (K) of a simple harmonic oscillator varies with displacement (x) as shown. The period of oscillation is: (mass of oscillator is 1 kg)



1. $\frac{\pi}{2}$ sec
2. $\frac{1}{2}$ sec
3. π sec
4. 1 sec

163.

In the diagram shown below, the induced charge on the left face of the dielectric slab of dielectric constant k is(Take area of the left face as A).



1. $-E_0 A\varepsilon_0\left(1-\ \frac{1}{k}\right)$
2. $E_0 A\varepsilon_0\left(1-\ \frac{1}{k}\right)$
3. $-E_0 A\varepsilon_0(k-1)$
4. $E_0 A\varepsilon_0(k-1)$

164.

A small circular loop of radius r is placed inside a circular loop of radius R (R >> r). The loops are coplanar and their centres coincide. The mutual inductance of the system is proportional to

1. r/R
2. r^2/R
3. r/R^2
4. r^2/R^2

165.

A wire of length l is folded to form double circular loop. If current in the wire is i, the magnetic field at the center is :

1. $\frac{\mu_0 i\pi}{2l}$
2. $\frac{\mu_0 i\pi}{l}$
3. $\frac{2\mu_0 i\pi}{l}$
4. $\frac{4\mu_0 i\pi}{l}$

166.

In Young's double slit experiment, a slit is covered with a thin film so that the optical path difference introduced between coherent waves is 5λ. Then the new position of central maxima will be at

1. The initial position of 5th maxima
2. The initial position of 3rd minima
3. The initial position of 2nd minima
4. The initial position of 3rd maxima

167.

The maximum possible wavelength in an open organ pipe of length l is

1. l
2. $2l$
3. $3l$
4. $4l$

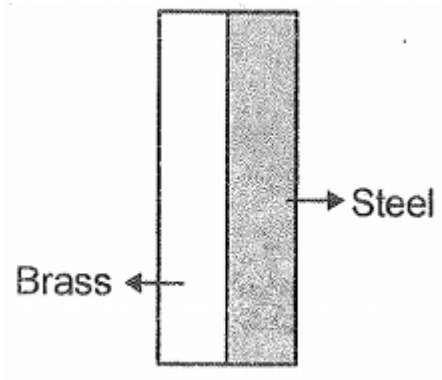
168.

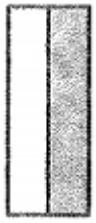
According to Bohr's atomic model

1. Mass of electron remains constant
2. The nucleus is of infinite mass and is at rest
3. Electron in a quantized orbit will not radiate energy
4. All of these

169.

A bimetallic strip is shown in the figure. On cooling, its shape will become $(\alpha_{\text{brass}} > \alpha_{\text{steel}})$



1. 

2. 

3. 

4. 

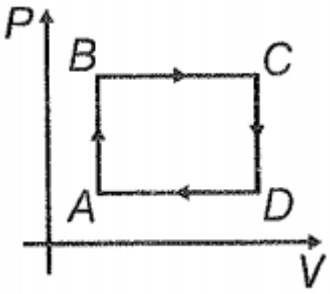
170.

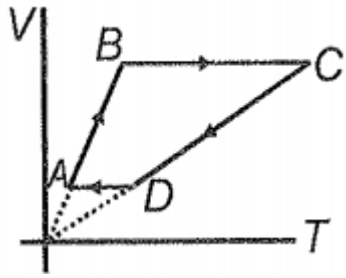
Two charges placed in the air at a distance of 1 m exert force 'F' on each other. If these charges are placed inside mica at the same distance, then the new net force between charges is-

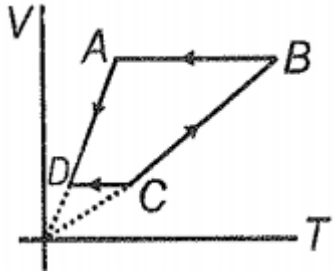
1. > F
2. < F
3. = F
4. Depends on the area of the slab

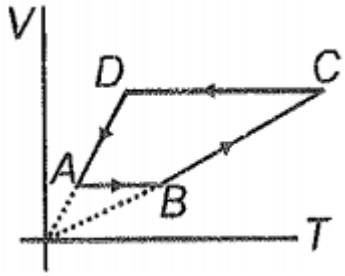
171.

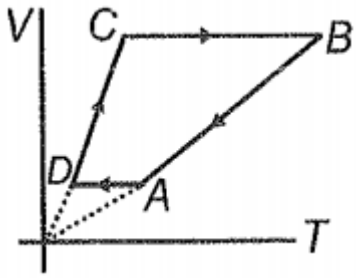
The figure shows a P-V diagram of a thermodynamic cycle. Which of the following V-T curve is correct?



1. 

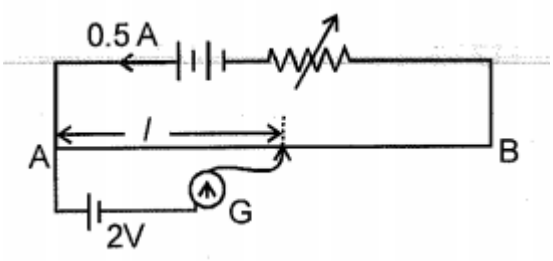
2. 

3. 

4. 

172.

For what value of the length l, the deflection in the galvanometer will be zero in the following potentiometer arrangement? The length of the wire AB is 4 m and its resistance is 10 Ω?



1. 0.8 m
2. 1.6 m
3. 2.4 m
4. 3.6 m

173.

In an unbiased p-n junction diode

1. p-type side is at higher potential than n-type side
2. p-type side is at lower potential than n-type side
3. Electric field is directed from n side to p side
4. Both 2 & 3

174.

Two convex lenses of focal lengths 10 cm and 30 cm are kept in contact. Then the correct statement is:

1. Effective focal length is 15 cm
2. Effective focal length is 7.5 cm
3. Combination behaves like a divergent lens
4. All of these

175.

When a point source of light is at 2 m from a photoelectric cell, the saturation current is 1.5 mA. If the same source is kept at a distance of 1 m from the cell, the saturation current will be:

1. 1.5 mA
2. 2.5 mA
3. 4.5 mA
4. 6.0 mA

176.

The de Broglie wavelength of a proton is λ. When the momentum of the proton is decreased by 50%, the de Broglie wavelength will become

1. $\frac{\lambda}{2}$
2. 1.2 λ
3. 1.5 λ
4. 2 λ

177.

A mercury drop does not spread on a glass plate because the angle of contact between glass and mercury is

1. Acute
2. Obtuse
3. Zero
4. 90°

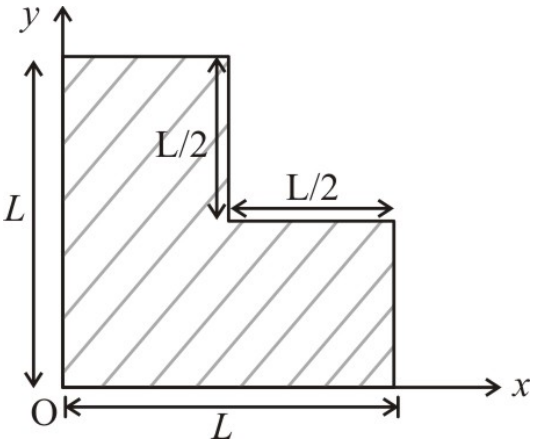
178.

A 100 kg gun fires a ball of 1 kg horizontally from a cliff of height 500 m. It falls on the ground at a distance of 400 m from the bottom of the cliff. The recoil velocity of the gun is (g = 10 m/s)

1. 0.2 m/s
2. 0.4 m/s
3. 0.6 m/s
4. 0.8 m/s

179.

The coordinates of centre of mass a uniform plate of shape as shown in the figure is



1. $\left(\frac{L}{2}, \frac{L}{2}\right)$
2. $\left(\frac{5L}{12}, \frac{5L}{12}\right)$
3. $\left(\frac{5}{3}L, \frac{2}{3}L\right)$
4. $\left(\frac{3L}{4}, \frac{L}{2}\right)$

180.

A uniform chain of length *l* and mass *m* overhangs a smooth table with its two-third part lying on the table. Find the kinetic energy of the chain as it completely slips off the table.

1. $\frac{4}{9}$mgl
2. $\frac{2}{9}$mgl
3. $\frac{1}{9}$mgl
4. $\frac{5}{9}$mgl

181.

Current in a circuit falls from 5.0 A to 0.0 A in 0.1 s. If an average emf of 200 V is induced, the self-inductance of the circuit is:

1. 4 H
2. 2 H
3. 1 H
4. 3 H

182.

The length, breadth, and thickness of a rectangular sheet of metal are 4.234 m, 1.005 m, and 2.01 cm respectively. The volume of the sheet to correct significant figures is:

1. 0.00856 m^3
2. 0.0856 m^3
3. 0.00855 m^3
4. 0.0855 m^3

183.

A jet airplane travelling at the speed of 500 $km\ h^{-1}$ ejects its products of combustion at the speed of 1500 $km\ h^{-1}$ relative to the jet plane. What is the speed of the latter with respect to an observer on the ground?

1. 1000 $km\ h^{-1}$
2. 500 $km\ h^{-1}$
3. 1500 $km\ h^{-1}$
4. 2000 $km\ h^{-1}$

184.

Rain is falling vertically with a speed of 30 m/s. A woman rides a bicycle with a speed of 10 m/s in the north to south direction. What is the direction in which she should hold her umbrella?

$\left[\text{Given : } \tan 16^0 = 0.29 \ \& \ \tan 18^0 = 0.33\right]$

1. 16^0 with the vertical, towards north
2. 18^0 with the vertical, towards north
3. 16^0 with the vertical, towards south
4. 18^0 with the vertical, towards south

185.

A sphere encloses an electric dipole with charges $\pm 3 \times 10^{-6} C$. What is the total electric flux through the sphere?

1. -3×10^{-6}
2. zero
3. 3×10^{-6} Nm^2/C
4. 6×10^{-6} Nm^2/C

Physics - Section B

186.

The M.K.S units of the coefficient of viscosity is:

1. kg $m^{-1}s^{-1}$

2. kg ms^{-2}

3. kg m^2s^{-1}

4. $kg^{-1}\ m^{-1}s^2$

187.

A man is crossing a river flowing with a velocity of 5 m/s. He reaches a point directly across the river at a distance of 60 m in 5 s. His velocity in still water should be:

1. 12 m/s

2. 13 m/s

3. 5 m/s

4. 10 m/s

188.

In the Davisson and Germer experiment, the velocity of electrons emitted from the electron gun can be increased by

1. increasing the filament current

2. decreasing the filament current

3. decreasing the potential difference between the anode and filament

4. increasing the potential difference between the anode and filament

189.

A rod of length 10 cm lies along the principal axis of a concave mirror of focal length 10 cm in such a way that its end closer to the pole is 20 cm away from the mirror. The length of the image is

(1) 10 cm

(2) 15 cm

(3)2.5 cm

(4) 5 cm

190.

The instantaneous angular position of a point on

a rotating wheel is given by the equation

$\theta(t) = 2t^3 - 6t^2$

The torque on the wheel becomes zero at-

1. t = 0.5 s

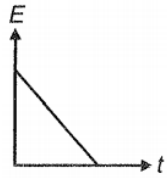
2. t = 0.25 s

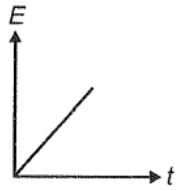
3. t = 2 s

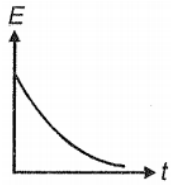
4. t = 1 s

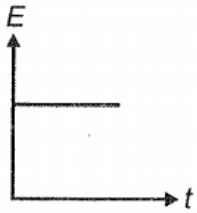
191.

For damped oscillator graph between energy and time is

1. 

2. 

3. 

4. 

192.

The electric field intensity and the electric potential at a point are E and V respectively. Which of the following is correct?

1. If E $\neq$ 0, V cannot be zero

2. If V $\neq$ 0, E cannot be zero

3. If V is constant and non-zero, E must be zero

4. If V=0, E must be zero

193.

Magnetic induction at an axial point of a short magnet at a distance r from the centre of dipole is $\vec{B}$. Its value at the equatorial point of the short magnet at the same distance from the centre of dipole is :

1. -$\vec{B}$

2. $\frac{\vec{B}}{2}$

3. $\vec{B}$

4. $\frac{\vec{-B}}{2}$

194.

A bullet fired towards a wall reduces its half kinetic energy after the penetration of 6 cm. The further penetration of the bullet in the wall is-

1. 2 cm

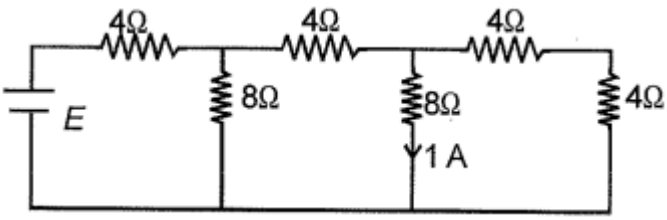
2. 1 cm

3. 6 cm

4. 3 cm

195.

The value of E (emf of cell) is-



1. 24 V

2. 32 V

3. 16 V

4. 8 V

196.

A body starting from rest moves with uniform acceleration on a horizontal surface. The body covers 3 consecutive equal distances from beginning in time t_1, t_2 and t_3 seconds. The ratio of $t_1 : t_2 : t_3$ is

1. 1:2:3

2. $1 : \sqrt{2} : \sqrt{3}$

3. $1 : \left(\sqrt{2} - 1\right) : \left(\sqrt{3} - \sqrt{2}\right)$

4. $\sqrt{3} : \sqrt{2} : 1$

197.

The resolving power of an electron microscope is R, when accelerating potential is V. If accelerating potential is increased by 3 V, then its new resolving power is-

1. 3R

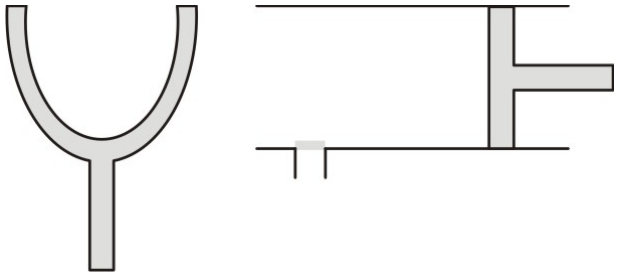
2. 2R

3. 4R

4. R

198.

A vibrating tuning fork of frequency 1000 Hz is placed near the open end of a long cylindrical tube. The tube has a side opening and is also fitted with a movable reflecting piston. As the piston is moved through x distance, the intensity of sound changes from a maximum to a minimum for an observer at the side opening. If the speed of sound is 350 meters per second, then x is-



1. 35 cm
2. 17.5 cm
3. 8.75 cm
4. 10 cm

199.

A small sphere of radius 2 cm falls from rest in a viscous liquid. Heat is produced due to viscous force. The rate of production of heat when the sphere attains its terminal velocity is proportional to-

1. 2^2
2. 2^3
3. 2^4
4. 2^5

200.

Two masses 8 kg and 12 kg are connected at the two ends of a light inextensible string that goes over a frictionless pulley. Then the acceleration of the masses and the tension in the string when the masses are released are:

1. $2\ ms^{-2},\ 69\ N$
2. $1\ ms^{-2},\ 69\ N$
3. $2\ ms^{-2},\ 96\ N$
4. $1\ ms^{-2},\ 96\ N$

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