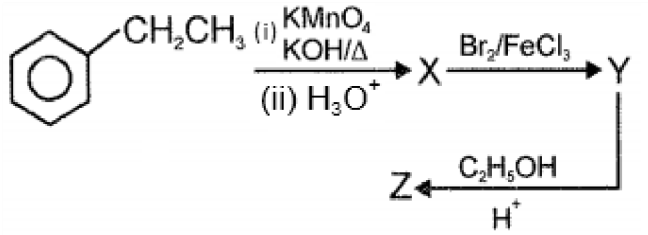
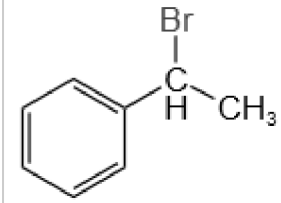
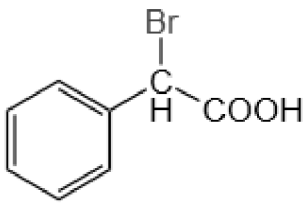
Test Paper - 10

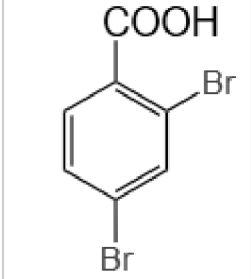
CHEMISTRY - SECTION A

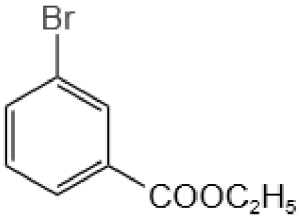
1 The product Z in the given sequence of reactions is-



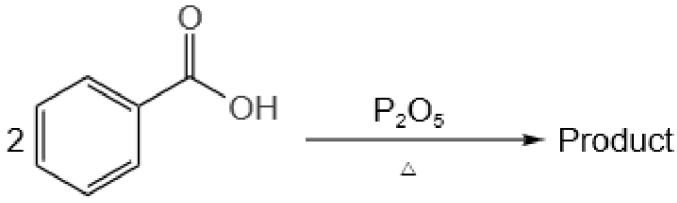
1. 

2. 

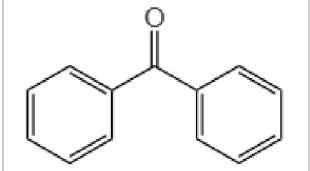
3. 

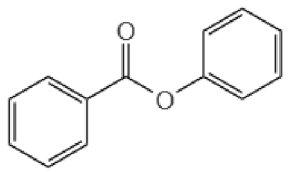
4. 

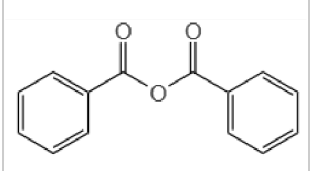
2

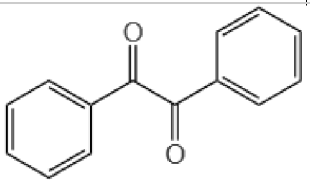


The structure of the product is:

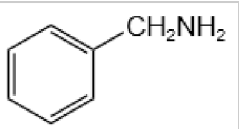
1. 

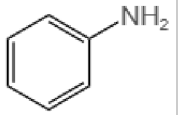
2. 

3. 

4. 

3 Which of the following compound(s) give(s) a foul-smelling substance on heating with chloroform and ethanolic potassium hydroxide?

I. 

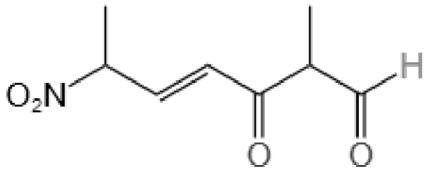
II. $(CH_3)_2NH$ III. 

1. l only
2. l and ll only
3. l and lll only
4. l, ll, and lll

4 An element A (at. wt. = 75) and B (at. wt. = 25) combine to form a compound that contains 75% A by weight. The formula of the compound will be

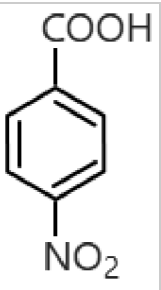
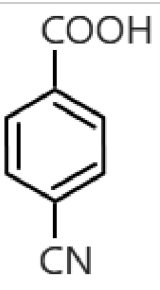
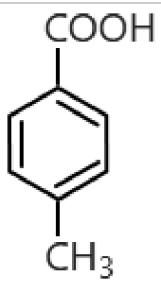
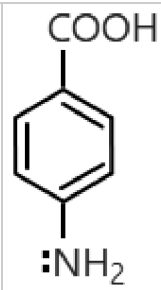
1. A_2B
2. A_3B
3. AB_3
4. AB

5 The nomenclature of the compound below is:



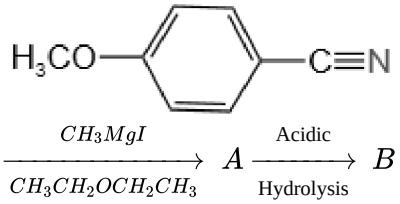
1. 2-methyl-6-nitro-3-oxohept-4-enal
2. 2, 6-dimethyl-6-nitro-oxohex-4-enal
3. 2-methyl-6-nitrohept-4-en-1, 3-dione
4. 2-methyl-6-nitro-3-oxohept-3-enal

6 The decreasing order of acidity of the following benzoic acid derivatives is-

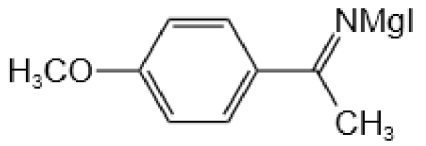
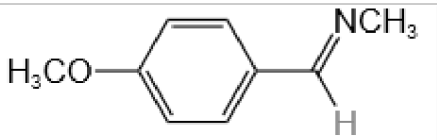
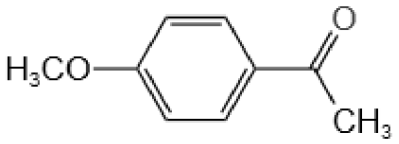
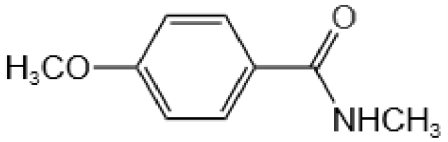
			
(P)	(Q)	(R)	(S)

1. P > Q > R > S
2. Q > P > S >R
3. S > R > Q > P
4. R > S > P > Q

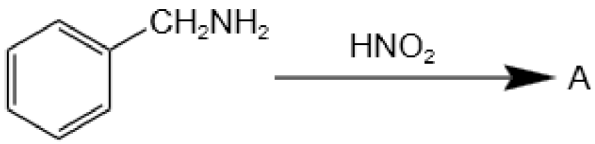
7 Consider the following reaction sequence:

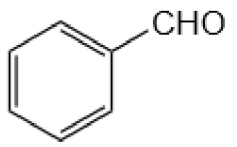
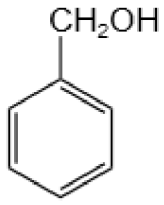
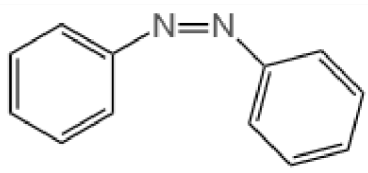
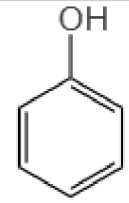


The structure of B is:

1.	
2.	
3.	
4.	

8 Product A in the reaction below is

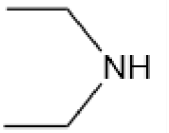
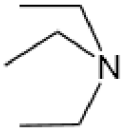


1.		2.	
3.		4.	

9 10 g H_2 is allowed to react completely with 70 g O_2. The mass of water formed is

1. 78.48 g
2. 90 g
3. 70.65 g
4. 85.73 g

10 Consider the following compounds:

A.		B.	
C.	NH_3	D.	$CH_3CH_2NH_2$

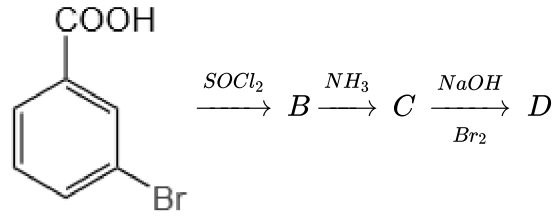
Choose the correct options for the decreasing order of basicity of the above compounds in the gaseous phase:

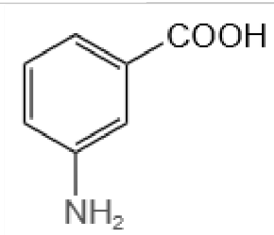
1. C > D > B > A
2. C > D > A > B
3. B > A > D > C
4. C > B > D > A

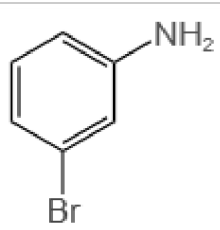
11 0.1 mole of a carbohydrate with empirical formula CH_2O contains 1 g of hydrogen. What is its molecular formula?

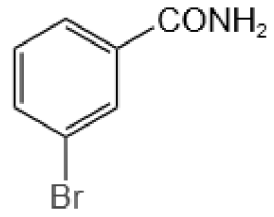
1. $C_5H_{10}O_5$
2. $C_6H_{12}O_6$
3. $C_4H_8O_4$
4. $C_3H_6O_3$

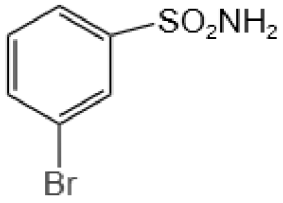
12 In a set of reactions, m-bromobenzoic acid gave a product D. The product D is:



1. 

2. 

3. 

4. 

13 How many gram of KCl would have to be dissolved in 60 g H_2O to give 40% by weight of solution?

1. 40 g
2. 20 g
3. 15 g
4. 10 g

14 Assertion(A): When 100 ml 1 M H_2SO_4 is mixed with 200 ml 1M NaOH, the solution becomes neutral.
Reason(R): Moles of H_2SO_4 are equal to moles of NaOH.

1. Both A and R are true and R is the correct explanation of A.
2. Both A and R are true but R is not the correct explanation of A.
3. A is true and R is false.
4. A and R both are false.

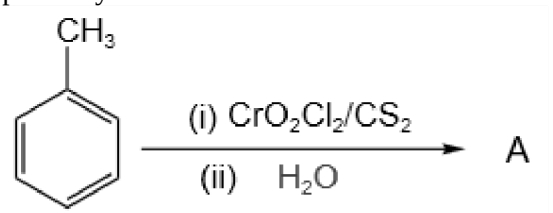
15 Match the chemical composition in List I with its name in List II

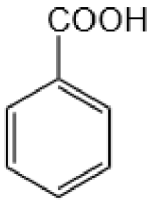
List I Chemical Composition	List II Reagent
A. Benzenesulphonyl chloride	I. Tollen's reagent
B. Anhydrous $ZnCl_2$ + Conc. HCl	II. Fehling A solution
C. Ammoniacal silver nitrate	III. Hinsberg's reagent
D. Aqueous $CuSO_4$ solution	IV. Lucas reagent

Choose the correct answer from the options given below:

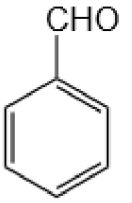
1. A - (IV); B - (III); C - (I); D - (II)
2. A - (III); B - (IV); C - (I); D - (II)
3. A - (III); B - (IV); C - (II); D - (I)
4. A - (I); B - (II); C - (IV); D - (III)

16 The product formed and the name of the reaction are respectively :

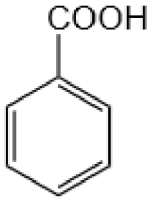


1. 

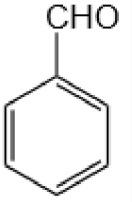
Gattermann-Koch reaction

2. 

Etard reaction

3. 

Etard reaction

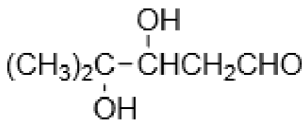
4. 

Stephen reaction

17 Assertion(A): Hydroxyketones are not directly used in Grignard reaction.
Reason(R): Grignard reagents react with hydroxyl group.
1. Both A and R are true and R is the correct explanation of A.
2. Both A and R are true but R is not the correct explanation of A.
3. A is a true statement but R is false.
4. Both A and R are false statements.

CHEMISTRY - SECTION B

18 On vigorous oxidation by potassium permanganate solution, $(CH_3)_2C = CHCH_2CHO$ gives-

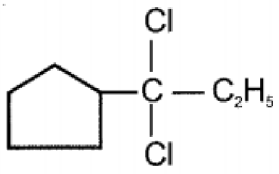
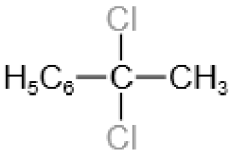
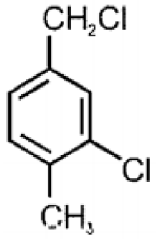
1.	$(CH_3)_2CO$ and $OHCCH_2CHO$
2.	
3.	$(CH_3)_2CO$ and $OHCH_2CHO$
4.	$(CH_3)_2CO$ and $CH_2(COOH)_2$

19 The conversion of oxygen to ozone occurs to the extent of 15% only. The mass of ozone that can be prepared from 67.2 L oxygen at 1 atm and 273 K will be:
1. 14.4 gm
2. 96 gm
3. 640 gm
4. 64 gm

20 An organic compound $C_5H_{10}O$ forms phenyl hydrazone that gives a positive iodoform test and undergoes Wolff Kishner reaction to give isopentane. The organic compound is-
1. Pentanol
2. Pentan-2-one
3. Pentan-3-one
4. 3-Methylbutan-2-one

21 The increasing order of reactivity of the following compounds in nucleophilic addition reaction is:
Propanal, Benzaldehyde, Propanone, Butanone
1. Butanone < Propanone < Benzaldehyde < Propanal
2. Propanal < Propanone < Butanone < Benzaldehyde
3. Benaldehyde < Propanal < Propanone < Butanone
4. Benzaldehyde < Butanone < Propanone < Propanal

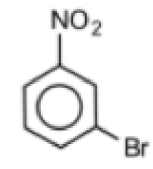
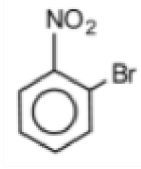
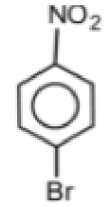
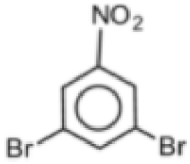
22 Identify the structure of $C_8H_8Cl_2$, which on aqueous alkali hydrolysis gives a product that does not give positive iodoform test but gives silver mirror test.

1.		2.	
3.		4.	$C_6H_5CH_2CHCl_2$

23 When 22.4 litres of $H_2(g)$ is mixed with 11.2 litres of $Cl_2(g)$, both at STP, the moles of HCl(g) formed is equal to :
1. 1 mol of HCl(g)
2. 2 mol of HCl(g)
3. 0.5 mol of HCl(g)
4. 1.5 mol of HCl(g)

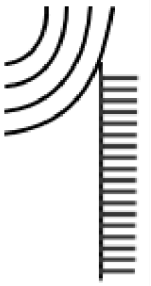
24 Assertion(A): Aniline does not undergo Friedel-Crafts reaction.
Reason(R): Friedel-Crafts is an electrophilic substitution reaction.
1. Both A and R are true and R is the correct explanation of A.
2. Both A and R are true but R is not the correct explanation of A.
3. A is true statement but R is false.
4. Both A and R are false statements.

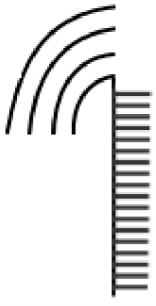
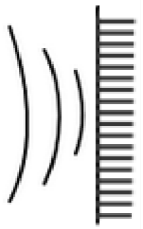
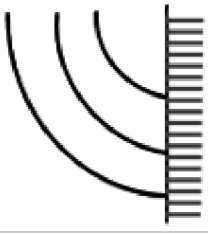
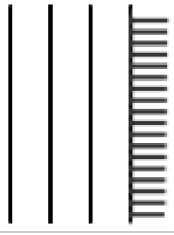
25 The compound B in the given below reaction is:

1.		2.	
3.		4.	

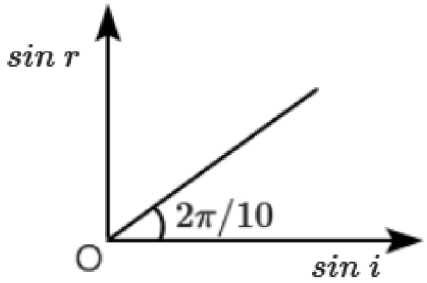
PHYSICS - SECTION A

26 Spherical wavefronts shown in the figure, strike a plane mirror (as shown in the figure below). Reflected wavefronts will be shown in:



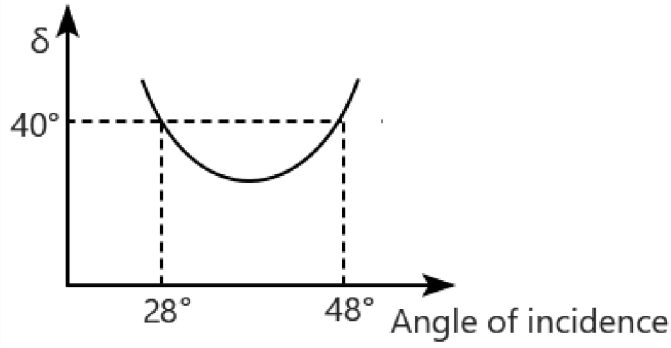
1.		2.	
3.		4.	

27 The graph between sine of angle of refraction ($\sin r$) in medium 2 and sine of angle of incidence ($\sin i$) in medium 1 indicates that: (Given $\tan\ 36^\circ \approx \frac{3}{4}$)



1.	total internal reflection can take place.
2.	total internal reflection cannot take place.
3.	any of (1) and (2).
4.	data is incomplete.

28 A graph is plotted between the angle of deviation δ in a triangular prism and the angle of incidence as shown in the figure. Refracting angle of the prism is:



1. 28°
2. 48°
3. 36°
4. 46°

29 A mass m (moving along the $x-$axis) with velocity v collides and sticks to mass of $3m$ moving vertically upward (along the $y-$axis) with velocity $2v$. The final velocity of the combination is:

1. $\frac{3}{2}v\hat{i} + \frac{1}{4}v\hat{j}$
2. $\frac{1}{4}v\hat{i} + \frac{3}{2}v\hat{j}$
3. $\frac{1}{3}v\hat{i} + \frac{2}{3}v\hat{j}$
4. $\frac{2}{3}v\hat{i} + \frac{1}{3}v\hat{j}$

30 Which of the following is the correct statement?

1.	Intermediate image in a compound microscope is real, erect and magnified.
2.	Intermediate image in a compound microscope is real, inverted and diminished.
3.	Intermediate image in a compound microscope is virtual, erect and magnified.
4.	Intermediate image in a compound microscope is real, inverted and magnified.

31 An electric lift with a maximum load of 2000 kg (lift+passengers) is moving up with a constant speed of 1.5 ms^{-1}. The frictional force opposing the motion is 3000 N. The minimum power delivered by the motor to the lift in watts is: (Take $g = 10\ ms^{-2}$)

1. 23500
2. 23000
3. 20000
4. 34500

32 A lens of focal length f_a in air consists of a glass of refractive index μ_g. If f_l is its focal length in a liquid of refractive index μ_l, then for $\mu_l = \mu_g$

1. $f_l = 0$
2. $\infty > f_l > f_a$
3. $0 < f_l < f_a$
4. $f_l = \infty$

33 Select the correct option based on statements below:

Assertion (A):	In an oblique, elastic collision between two equal spheres, the final velocities are perpendicular to each other.
Reason (R):	In such a collision, both momentum and kinetic energy are conserved.

1.	Both Assertion & Reason are true and the reason is the correct explanation of the assertion.
2.	Both Assertion & Reason are true but the reason is not the correct explanation of the assertion.
3.	Assertion is true statement but Reason is false.
4.	Both Assertion and Reason are false statements.

34 An astronomical telescope has magnifying power 10. The focal length of the eyepiece is 20 cm. The focal length of the objective is:

1. $\frac{1}{200}$ cm
2. $\frac{1}{2}$ cm
3. 2 cm
4. 200 cm

35 Two waves are given by $y_1 = asin\left(\omega t - kx\right)$ and $y_2 = acos\left(\omega t - kx\right)$. The phase difference between the two waves is:

1. $\frac{\pi}{4}$
2. π
3. $\frac{\pi}{8}$
4. $\frac{\pi}{2}$

36 The potential energy between two atoms in a molecule is given by $U\left(x\right) = \frac{a}{x^{12}} - \frac{b}{x^6}$; where a and b are positive constants and x is the distance between the atoms. The atoms are in stable equilibrium when:

1. $x = \sqrt[6]{\frac{11a}{5b}}$
2. $x = \sqrt[6]{\frac{a}{2b}}$
3. $x = 0$
4. $x = \sqrt[6]{\frac{2a}{b}}$

37 In a wave, the path difference, Δx corresponding to a phase difference of $\Delta\phi$ is:

1. $\frac{\pi}{2\lambda}\Delta\phi$
2. $\frac{\pi}{\lambda}\Delta\phi$
3. $\frac{\lambda}{2\pi}\Delta\phi$
4. $\frac{\lambda}{\pi}\Delta\phi$

38 Light is:

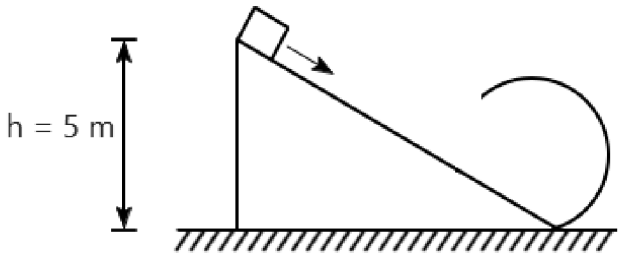
1. a wave phenomenon
2. a particle phenomenon
3. both particle and wave phenomenon
4. none of the above

39 Select the correct option based on the statements given below:

Assertion (A):	A normal human eye can clearly see all the objects beyond a certain minimum distance.
Reason (R):	The human eye has the capacity to suitably adjust the focal length of its lens to a certain extent.

1.	Both Assertion & Reason are true and the reason is the correct explanation of the assertion.
2.	Both Assertion & Reason are true but the reason is not the correct explanation of the assertion.
3.	Assertion is true statement but Reason is false.
4.	Both Assertion and Reason are false statements.

40 As per the given figure to complete the circular loop, what should be the radius of the loop?



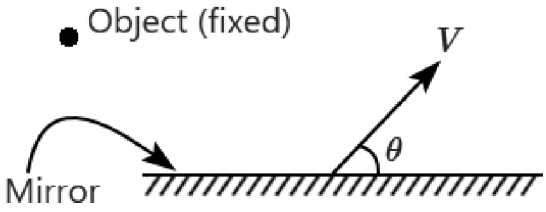
1. 4 m
2. 3 m
3. 2.5 m
4. 2 m

41 A concave lens of focal length 25 cm can produce an image $\frac{1}{10}$th the size of the object. The distance of the object from the lens is:
1. 225 cm
2. 250 cm
3. 150 cm
4. 175 cm

42 Two coherent sources of different intensities send waves which interfere. The ratio of maximum intensity to the minimum intensity is 25. The intensities of the sources are in the ratio:
1. 25 : 1
2. 5 : 1
3. 9 : 4
4. 625 : 1

PHYSICS - SECTION B

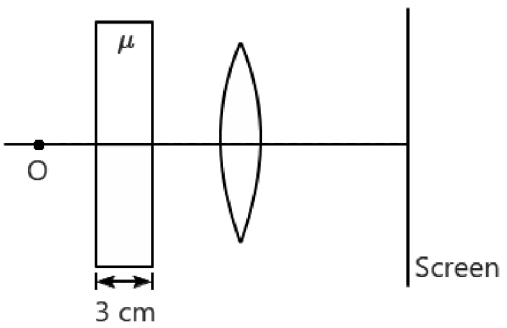
43 An object and a plane mirror are shown in the figure. The mirror is moving with velocity V as shown. The velocity of the image is:



1. $2V sin\theta$
2. $2V$
3. $2V cos\theta$
4. none of these

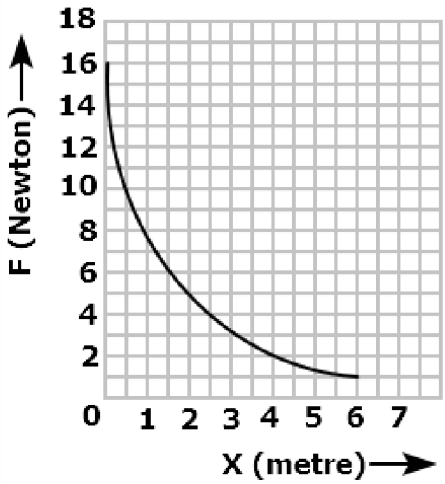
44 A concave mirror of focal length 100 cm is used to obtain the image of the sun which subtends an angle of $30'$. The diameter of the image of the sun will be:
1. 1.74 cm
2. 0.87 cm
3. 0.435 cm
4. 100 cm

45 A convex lens forms the image of a point object O on the screen. If a glass slab of thickness 3 cm and refractive index 1.5 is put as shown below, then to have the image of the object on the screen, the object should be shifted:



1.	away from the lens by 1 cm
2.	away from the lens by 1.5 cm
3.	towards the lens by 1 cm
4.	towards the lens by 1.5 cm

46 The relation between the displacement X of an object produced by the application of the variable force F is represented by a graph (as shown in the figure below). If the object undergoes a displacement from $X = 0.5$ m to $X = 2.5$ m the work done will be approximately equal to:



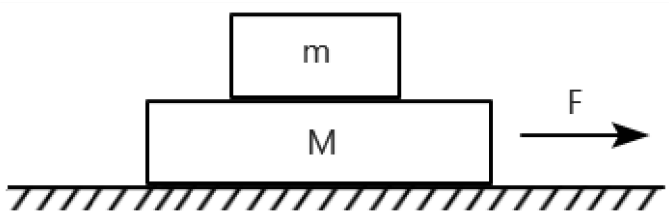
1. 16 J
2. 32 J
3. 1.6 J
4. 8 J

47 If the light moving in a straight line bends by a small but fixed angle, it may be a case of
(a) reflection
(b) refraction
(c) diffraction
(d) dispersion
Choose the correct option:

1.	(a) and (b)
2.	(b) and (c)
3.	(c) and (d)
4.	all of these

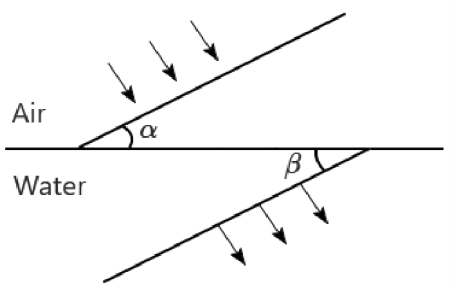
48 A ray of light is incident normally on one of the faces of a prism of apex angle 30° and refractive index $\sqrt{2}$. The angle of deviation of the ray is:
1. 15°
2. 30°
3. 45°
4. 60°

49 A force F is applied to a system of two blocks: as shown in the figure. There is no friction between the lower block and the table. Due to friction between the blocks of masses m and M, they move together through a distance x.
Then work done by F on m is:



1. $\frac{Fx}{2}$
2. $\frac{m}{m+M}Fx$
3. $\frac{M}{M+m}Fx$
4. none of the above

50 Sound waves travel faster in water than in air. Imagine a plane sound wavefront incident at an angle α at the air-water interface; the refracted wavefront making an angle β with the interface. Then,



1. $\alpha > \beta$
2. $\beta > \alpha$
3. $\alpha = \beta$
4. the relation between α & β cannot be predicted.

BIOLOGY 1 - SECTION A

51 What temperature is used to give heat shock when competence is induced in a bacterial host cell enabling it to take up rDNA?
1. 27°C
2. 42°C
3. 72°C
4. 98°C

52 A transgenic tobacco plant was created to make it resistant to:

1.	a nematode, *Meloidegyne incognitia.*
2.	a nematode, *Coenorhabditis elegans.*
3.	a trematode, *Clonorchis sinensis.*
4.	a cestode, *Taenia sloium.*

53 Evolution of different species in a given area starting from a point and spreading to other geographical areas is known as
1. Adaptive radiation
2. Natural selection
3. Migration
4. Divergent evolution

54 According to Oparin, which one of the following was not present in the primitive atmosphere of the earth ?
1. Oxygen
2. Hydrogen
3. Water vapour
4. Methane

55 In a population of 1000 individuals, 360 belong to genotype AA, 480 to Aa and the remaining 160 to aa. Based on this data, the frequency of allele A in the population is :
1. 0.4
2. 0.5
3. 0.6
4. 0.7

56 The source of complementary RNA for RNAi in a eukaryotic cell could be:

I:	An infection by viruses having RNA genomes
II:	Mobile genetic elements that replicate via an RNA intermediate
III.	Integration of phage DNA into the main chromosomal DNA of a eukaryotic cell

1.	Only I and II
2.	Only I and III
3.	Only II and III
4.	I, II and III

57 Identify the incorrect statement:

1.	There are 27 documented varieties of Basmati grown in India.
2.	In 1997, an American company got patent rights on Basmati rice by biopiracy.
3.	Indian Basmati was crossed with semi-dwarf varieties and claimed as aan invention or a novelty.
4.	There are an estimated 200 varieties of rice in India alone.

58 The European Federation of Biotechnology [EFB] defines biotechnology as:

1.	The use of living cells and bacteria in industrial and scientific processes.
2.	The integration of natural sciences and organisms, cells, parts there of and molecular analogues for products and services.
3.	The use of biology to solve problems and make useful products.
4.	The use of biology to develop new products, methods and organisms intended to improve human health and society.

59 The term ‘molecular scissors’ is used for:
1. restriction enzymes
2. Taq polymerase
3. reverse transcriptase
4. DNA ligase

60 In Hardy-Weinberg equation, the frequency of heterozygous individual is represented by
1. p^2
2. 2pq
3. pq
4. q^2

61 The finches of Galapagos islands provide an evidence in favour of:
1. special creation
2. evolution due to mutation
3. retrogressive evolution
4. biogeographical evolution

62 In the case of peppered moth **(**Biston betularia), the black-coloured form became dominant over the light-coloured form in England during the industrial revolution. This is an example of
1. natural selection, whereby the darker forms were selected
2. appearance of the darker coloured individuals due to very poor sunlight
3. protective mimicry
4. inheritance of darker colour character acquired due to the darker environment

63

Assertion (A):	The manipulation of living organisms by the human race cannot go on any further, without regulation.
Reason (R):	Genetic modification of organisms can have unpredictable results when such organisms are introduced into the ecosystem.

1.	Both Assertion and Reason are true and the Reason explains the Assertion.
2.	Assertion is true but Reason is false.
3.	Both Assertion and Reason are true but the Reason does not explain the Assertion.
4.	Both Assertion and Reason are false.

64 Consider the two statements:

I:	Most of the developing and underdeveloped world is rich financially but poor in biodiversity and traditional knowledge.
II:	Most of the industrialised nations are rich in biodiversity and traditional knowledge related to bio-resources and poor in biotechnology.

1.	Statement I is correct
2.	Statement II is correct
3.	Both Statement I and Statement II are correct
4.	Both Statement I and Statement II are incorrect

65 Which one of the following was obtained by S. Miller in his experiments on origin of life before 1953 :
1. Simple sugars
2. Amino acids
3. Nucleotide
4. Peptides

66 All the following are possible today with the use of GM crops except:

1.	More tolerance to abiotic stresses
2.	Alternative resources to industries
3.	Increased efficiency of mineral usage by plants
4.	Fixation of atmospheric nitrogen

67 The factor that leads to Founder effect in a population is:
1. Mutation
2. Genetic drift
3. Natural selection
4. Genetic recombination

BIOLOGY 1 - SECTION B

68
The process by which organisms with different evolutionary history evolve similar phenotypic adaptations in response to a common environmental challenge is called:
1. Convergent evolution
2. Non-random evolution
3. Adaptive radiation
4. Natural selection

69

Assertion (A):	Transgenic mice are being used to test the safety of polio vaccine.
Reason (R):	Monkeys are not reliable to test the safety of polio vaccine.

1.	Both Assertion and Reason are false.
2.	Both Assertion and Reason are true but the Reason does not explain the Assertion.
3.	Assertion is true but Reason is false.
4.	Both Assertion and Reason are true and the Reason explains the Assertion.

70

The similarity of bone structure in the forelimbs of many vertebrates is an example of
1. Homology
2. Analogy
3. Convergent evolution
4. Adaptive radiation

71 In a species, the weight of a newborn ranges from 2 to 5 kg. 97% of the newborns with an average weight between 3 to 3.3 kg survive whereas 99% of the infants born with weights from 2 to 2.5 kg or 4.5 kg to 5 kg die. Which type of selection process is taking place?
1. Cyclical selection
2. Directional selection
3. Stabilizing selection
4. Disruptive selection

72 Consider the two statements:

I:	Transgenic animals are being used for testing toxicity of drugs.
II:	Transgenic animals are made that carry genes which make them more sensitive to toxic substances than non-transgenic animals.

1.	Statement I is correct and Statement II is incorrect
2.	Both Statement I and Statement II are correct
3.	Both Statement I and Statement II are incorrect
4.	Statement I is incorrect and Statement II is correct

73 The tendency of population to remain in genetic equilibrium may be disturbed by
1. Random mating
2. Lack of migration
3. Lack of mutations
4. Lack of random mating

74 In Australia, marsupials and placental mammals have evolved to share many similar characteristics. This type of evolution may be referred to as-
1. Adaptive Radiation
2. Divergent Evolution
3. Cyclical Evolution
4. Convergent Evolution

75 Which one of the following sequences was proposed by Darwin and Wallace for organic evolution ?

1.	Overproduction, variations, constancy of population size, natural selection
2.	Variations, constancy of population size, overproduction, natural selection
3.	Overproduction, constancy of population size, variations, natural selection
4.	Variations, natural selection, overproduction, constancy of population size

BIOLOGY 2 - SECTION A

76 Assertion (A): Amount of secondary xylem produced is more than the secondary phloem in the dicot stem.
Reason (R): Cambium is generally more active on the inner side than on the outer.
1. If both Assertion & Reason are true and the reason is the correct explanation of the assertion.
2. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion.
3. If Assertion is a true statement but the reason is false.
4. If both Assertion and Reason are false statements.

77 Given below are the names of some plants:
Guava, Cucumber, Peach, Rose, Plum, Brinjal, China rose and Mustard
How many of the above plants will have hypogynous, perigynous and epigynous flowers respectively?
1. Hypogynous = 3, Perigynous = 4, Epigynous = 2
2. Hypogynous = 1, Perigynous = 4, Epigynous = 4
3. Hypogynous = 3, Perigynous = 3, Epigynous = 2
4. Hypogynous = 2, Perigynous = 3, Epigynous = 2

78 Given below are two statements

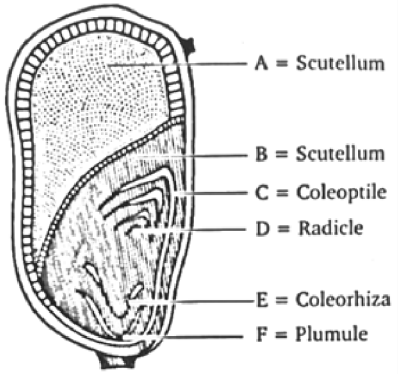
Statement I: The direction of movement of water and nutrients in xylem and phloem is unidirectional

Statement II: Sucrose is transported from the source to the sink via phloem

In light of the above statement, choose the most appropriate answer from the options given below

1. Both Statement I and Statement II are correct
2. Both Statement I and Statement II are incorrect
3. Statement I is correct but Statement II is incorrect
4. Statement I is incorrect but Statement II is correct

79 Which of the labels in the diagram given below are incorrectly mentioned?



1. A and D only
2. B and C
3. A only
4. A, D, E and F

80 Read the following statements and mark true (T) or false (F)

I. Movement in xylem is always bi-directional

II. Cohesion is the mutual attraction between water molecules

III. Transpiration mainly occurs through stomata

	I	II	III
1.	F	T	T
2.	T	F	T
3.	F	F	T
4.	T	T	F

81 Match the following and choose the correct option from below

A	Cuticle	i.	Guard cells
B	Bulliform cells	ii.	Single layer
C	Stomata	iii.	Waxy layer
D	Epidermis	iv.	Empty colourless cell

Options:

1.	A-iii	B-iv	C-i	D-ii
2.	A-i	B-ii	C-iii	D-iv
3.	A-iii	B-ii	C-iv	D-i
4.	A-iii	B-ii	C-i	D-iv

82 Which one is true of collenchyma?

1. forms the hypodermis of dicot stem
2. present below epidermis in layers or patches
3. thickened corners due to cellulose, hemicellulose, and pectin deposition
4. All of the above

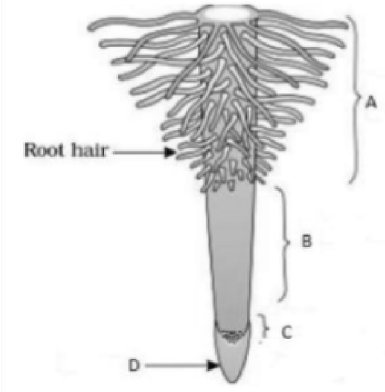
83 Match the placental types (column-I) with their examples (column-II)

Column I	Column II
(a) Basal	(i) Mustard
(b) Axile	(ii) China rose
(c) Parietal	(iii) *Dianthus*
(d) Free central	(iv) Sunflower

Choose the correct answer from the following options:

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

84 The region responsible for growth in the length of the root is:



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

85 How many of the following statements are true for heartwood?
I. It provides mechanical support to the stem
II. It does not conduct water
III. It is hard, durable, and resistant to the attacks of microbes
IV. It is the innermost layer of the wood
V. It comprises dead elements with highly lignified walls
VI. More the heartwood is present, the better is the quality of the wood
1. Four
2. Five
3. Six
4. Three

86 Find the incorrect match w.r.t. transport in plants :
1. Simple diffusion – Does not require special membrane protein
2. Active transport – Does not show uphill transport
3. Facilitated transport – Transport saturation can occur
4. Active transport – Highly selective nature

87 Select the correct option based on statements below:

Assertion (A):	Water and mineral uptake by root hairs from the soil occurs through apoplast until it reaches endodermis.
Reason (R):	Casparian strips in endodermis are suberized.

1.	Both (A) and (R) are true and (R) is the correct explanation of (A).
2.	Both (A) and (R) are true but (R) is not the correct explanation of (A).
3.	(A) is true but (R) is false.
4.	Both (A) and (R) are false.

88 Identify the family with the following characters:
(i) Leaves having alternate phyllotaxy
(ii) Bisexual and actinomorphic flowers
(iii) Five epipetalous stamens
(iv) Fruits are berry or capsule
(v) Seeds are endospermous
1. Solanaceae
2. Liliaceae
3. Fabaceae
4. Brassicaceae

89 How many of the following are parts of Ground Tissue System?
Epidermis, hypodermis, general cortex, endodermis, pericycle, medullary rays, vascular bundle, pith, leaf mesophyll
1. 9
2. 7
3. 6
4. 5

90 Find the incorrect statement :
1. The presence of vessels is the characteristic feature of angiosperms
2. Sieve tubes are present in gymnosperms
3. The radial conduction of water takes place by the ray parenchymatous cells
4. Xylem fibres have highly thickened walls and obliterated central lumens

91 Select the incorrect statement from the four given below :
1. Mycorrhiza is a symbiotic association of a fungus and young roots of a plant
2. Seeds of pinus cannot germinate properly without developing a mycorrhizal association
3. Movement of water is relatively faster in the symplastic pathway
4. Most of the water flow in the roots occurs via the apoplast

92 Read the following statements and mark true (T) or false (F).
(A) Mycorrhiza is a symbiotic association of a fungus with a root system.
(B) Imbibition is a special type of diffusion.
(C) Facilitated transport is not highly selective.

	A	B	C
1	T	F	F
2	T	T	F
3	F	F	T
4	T	T	T

BIOLOGY 2 - SECTION B

93 During translocation of sugars in plants from source to sink:
1. The loading of sugar at source is by active transport and unloading at the sink is by passive transport.
2. The loading of sugar at source is by passive transport and unloading at the sink is by active transport.
3. Both loading at the source and unloading at the sink are by active transport.
4. Both loading at the source and unloading at the sink are by passive transport.

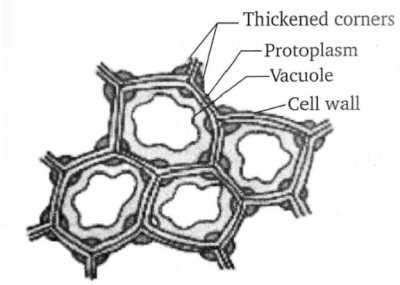
94 Consider the following:
I. A decrease in pressure on cell exerted by the wall
II. An increase in water potential of the surroundings
III. The uptake of solutes by the cell
IV. An increase in the tension on the surrounding solution
Which of the above would contribute to the uptake of water by the cell?
1. I, II, III
2. II, III, IV
3. I, II, IV
4. I, III, IV

95 Which of the following is true in a vertical section of dorsoventral leaf?
1. Mesophyll is undifferentiated.
2. Mesophyll is differentiated into palisade on one side of leaf and spongy parenchyma on the other side.
3. Palisade is present but spongy parenchyma is absent.
4. Spongy parenchyma is present but palisade absent.

96 Assertion (A) : Phellogen is a secondary meristem that forms cork on the outer side and secondary cortex on the inner side.
Reason (R) : Phellogen is formed every year from hypodermis and pericycle in dicot root and dicot stem respectively.
1. If both Assertion & Reason are true and the reason is the correct explanation of the assertion.
2. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion.
3. If Assertion is a true statement but the reason is false.
4. If both Assertion and Reason are false statements.

97 Given below are two statements
Statement I: The greater is the concentration of water in a system, lower is its kinetic energy or water potential
Statement II: Pure water will have the lowest water potential
In light of the above statements, choose the most appropriate answer from the options given below
1. Both Statement I and Statement II are correct
2. Both Statement I and Statement II are incorrect
3. Statement I is correct but statement II is incorrect
4. Statement I is incorrect but Statement II is correct

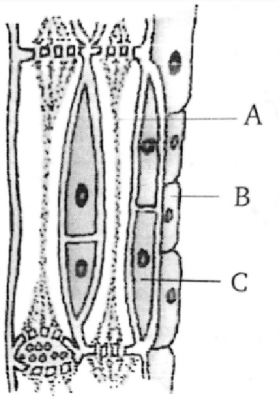
98 Which one is correct for the tissue depicted in the diagram given below?



1. Cells lack deposition of pectin
2. Cells are never photosynthetic
3. Intercellular spaces are absent
4. These are absent in hypodermis of dicot stems

99 Which of the following is incorrect statement?
1. Closely packed imbibant will imbibe more water than loosely packed one
2. During plasmolysis water is first lost from cytoplasm and then from vacuole
3. ψ_s is always less than zero in solutions
4. Transpiration maintains the shape and structure of the plants by keeping cells turgid

100 Identify A, B, and C of phloem:



1. A = Sieve tube, B = Phloem parenchyma, C = Companion cell
2. A = Companion cell, B = Phloem parenchyma, C= Sieve tube
3. A = Phloem parenchyma, B= Companion cell, C= Sieve tube
4. A = Companion cell, B= Sieve tube, C= Phloem parenchyma