National Testing Agency

Question Paper Name :	Nano Science Nano Technology 23rd March 2024 Shift 2
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Nano Science Nano Technology

Group Number :	1
Group Id :	680191176
Group Maximum Duration :	0
Group Minimum Duration :	105
Show Attended Group? :	No
Edit Attended Group? :	No
Break time :	0
Group Marks :	300
Is this Group for Examiner? :	No
Examiner permission :	Cant View
Show Progress Bar? :	No

Nano Science Nano Technology

Section Id :	680191209
Section Number :	1

Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	75
Number of Questions to be attempted :	75
Section Marks :	300
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	680191296
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 1 Question Id : 68019113401 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Bond angle in ammonia molecule is

1. Higher than the methane molecule
2. Higher than the water molecule
3. Lower than the water molecule
4. Equal to the methane molecule

Options :

68019152901. 1

68019152902. 2

68019152903. 3

68019152904. 4

Question Number : 2 Question Id : 68019113402 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Fullerene is the allotrope of

1. Carbon
2. Sulphur
3. Phosphorus
4. Fluorine

Options :

68019152905. 1

68019152906. 2

68019152907. 3

68019152908. 4

Question Number : 3 Question Id : 68019113403 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Which of the following oxidation state of lanthanides is preferabley more stable

1. +2 oxidation state
2. +3 oxidation state
3. +4 oxidation state
4. +1 oxidation state

Options :

68019152909. 1

68019152910. 2

68019152911. 3

68019152912. 4

Question Number : 4 Question Id : 68019113404 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Which pair of the following transition elements pair shows the highest number of oxidation states?

1. Chromium and Titanium
2. Nickel and Iron
3. Copper and Zinc
4. Chromium and Manganese

Options :

68019152913. 1

68019152914. 2

68019152915. 3

68019152916. 4

Question Number : 5 Question Id : 68019113405 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Ziegler-Natta catalyst is used for the polymerization of ethylene to produce

1. Steroregular polyethylene
2. Branched polyethylene
3. Low density polyethylene
4. Random polyethylene

Options :

68019152917. 1

68019152918. 2

68019152919. 3

68019152920. 4

Question Number : 6 Question Id : 68019113406 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

PCl_5 is highly reactive, hence, in solid state, it is dissociated into

1. $[PCl_4]^+$ tetrahedral and $[PCl_6]^-$ octahedral respectively
2. $[PCl_3]^+$ and $[PCl_3]^-$ respectively
3. $[PCl_2]^+$ tetrahedral and $[PCl_4]^-$ octahedral respectively
4. $[PCl_2]^+$ tetrahedral and $[PCl_3]^-$ octahedral respectively

Options :

68019152921. 1

68019152922. 2

68019152923. 3

68019152924. 4

Question Number : 7 Question Id : 68019113407 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

For the change Fe^{3+}/ Fe^{2+}, E° is +0.77 V, which indicates

1. Fe^{3+} has the tendency to reduce to Fe.
2. Fe^{2+} has the tendency to reduce to Fe.
3. Fe^{2+} has the tendency to reduce to Fe but Fe^{3+} does not has the tendency to reduce to Fe.
4. Neither Fe^{3+} nor Fe^{2+} have the tendency to reduce to Fe.

Options :

68019152925. 1

68019152926. 2

68019152927. 3

68019152928. 4

Question Number : 8 Question Id : 68019113408 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Liquid drop model was proposed to explain

1. The structure of an atom
2. The stability of the nucleus
3. Geometry of the molecules
4. Polarization in the molecule

Options :

68019152929. 1

68019152930. 2

68019152931. 3

68019152932. 4

Question Number : 9 Question Id : 68019113409 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Gadolinium belong to the

1. s-block elements
2. p-block elements
3. d-block elements
4. f-block elements

Options :

68019152933. 1

68019152934. 2

68019152935. 3

68019152936. 4

Question Number : 10 Question Id : 68019113410 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Which of the following has the highest bond order?

1. O_2^-
2. O_2^{--}
3. O_2^+
4. O_2^{++}

Options :

68019152937. 1

68019152938. 2

68019152939. 3

68019152940. 4

Question Number : 11 Question Id : 68019113411 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The correct energy order for molecular orbitals is

1. Bonding MO < non-bonding MO < antibonding MO
2. Antibonding MO < non-bonding MO < bonding MO
3. Non-bonding MO < bonding MO < antibonding MO
4. Bonding MO < antibonding MO < non-bonding MO

Options :

68019152941. 1

68019152942. 2

68019152943. 3

68019152944. 4

Question Number : 12 Question Id : 68019113412 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

$[Co(NH_3)_6][Cr(CN)_6]$ and $[Cr(NH_3)_6][Co(CN)_6]$ are the example of

1. Linkage isomerism
2. Coordination isomerism
3. Ionisation isomerism
4. Hydrate isomerism

Options :

68019152945. 1

68019152946. 2

68019152947. 3

68019152948. 4

Question Number : 13 Question Id : 68019113413 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

A thermodynamic process which is carried out at constant temperature is called

1. Isochoric process
2. Isothermal process
3. Isobaric process
4. Adiabatic process

Options :

68019152949. 1

68019152950. 2

68019152951. 3

68019152952. 4

Question Number : 14 Question Id : 68019113414 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Which of the following is correct for ionic product of water

1. $K_w = [H^+][OH^-]$
2. $K_w = [H^+] + [OH^-]$
3. $K_w = [H^+] - [OH^-]$
4. $K_w = [H^+] = [OH^-]$

Options :

68019152953. 1

68019152954. 2

68019152955. 3

68019152956. 4

Question Number : 15 Question Id : 68019113415 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

For the isolated system, if the entropy change is positive, then the process will be

1. Spontaneous
2. Non-spontaneous
3. In equilibrium
4. Reversible

Options :

68019152957. 1

68019152958. 2

68019152959. 3

68019152960. 4

Question Number : 16 Question Id : 68019113416 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Lower value ($<10^{-3}$) of equilibrium constant shows that the

1. Forward reaction is favoured.
2. Backward reaction is favoured.
3. Equilibrium will never be established.
4. Concentration of products dominate over concentration of reactants.

Options :

68019152961. 1

68019152962. 2

68019152963. 3

68019152964. 4

Question Number : 17 Question Id : 68019113417 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Manufacturing of ammonia, is favoured at

1. Low temperature and high pressure
2. High temperature and low pressure
3. High temperature and high pressure
4. Low temperature and low pressure

Options :

68019152965. 1

68019152966. 2

68019152967. 3

68019152968. 4

Question Number : 18 Question Id : 68019113418 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Which of the following statement is not correct for acids

1. They turns blue litmus to red
2. They react with active metal to produce hydrogen
3. They turns red litmus to blue
4. They are sour in taste

Options :

68019152969. 1

68019152970. 2

68019152971. 3

68019152972. 4

Question Number : 19 Question Id : 68019113419 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Conjugate base of H_2SO_4 is

1. SO_4^{2-}
2. HSO_4^{2-}
3. HSO_4^{-}
4. SO_4^{-}

Options :

68019152973. 1

68019152974. 2

68019152975. 3

68019152976. 4

Question Number : 20 Question Id : 68019113420 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Which of the following acidity order is correct?

1. $HI < HBr = HCl < HF$
2. $HF < HCl < HI < HBr$
3. $HI < HBr < HCl < HF$
4. $HF < HCl < HBr < HI$

Options :

68019152977. 1

68019152978. 2

68019152979. 3

68019152980. 4

Question Number : 21 Question Id : 68019113421 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

In methyl cation (CH_3^+) , carbon is

1. sp^3- hybridized
2. sp^2- hybridized
3. sp-hybridized
4. spd^2- hybridized

Options :

68019152981. 1

68019152982. 2

68019152983. 3

68019152984. 4

Question Number : 22 Question Id : 68019113422 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

In naphthalene, total number of delocalised π-electrons are

1. 4
2. 10
3. 8
4. 12

Options :

68019152985. 1

68019152986. 2

68019152987. 3

68019152988. 4

Question Number : 23 Question Id : 68019113423 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Friedel-Craft acylation is an example of

1. Electrophilic substitution reaction
2. Nucleophilic substitution reaction
3. Electrophilic addition reaction
4. Nucleophilic addition reaction

Options :

68019152989. 1

68019152990. 2

68019152991. 3

68019152992. 4

Question Number : 24 Question Id : 68019113424 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Which of the following order of carbocation stability is correct?

1. $CH_3^+ < CH_3CH_2^+ < (CH_3)_2CH^+ < (CH_3)_3C^+$
2. $CH_3^+ > CH_3CH_2^+ > (CH_3)_2CH^+ > (CH_3)\,C^+$
3. $CH_3CH_2^+ < CH_3^+ < (CH_3)_2CH^+ < (CH_3)_3C^+$
4. $(CH_3)_2CH^+ < CH_3^+ < CH_3CH_2^+ < (CH_3)_3C^+$

Options :

68019152993. 1

68019152994. 2

68019152995. 3

68019152996. 4

Question Number : 25 Question Id : 68019113425 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The monomer unit of natural rubber is

1. Isoprene
2. Ethylene
3. Isobutylene
4. Propene

Options :

68019152997. 1

68019152998. 2

68019152999. 3

68019153000. 4

Question Number : 26 Question Id : 68019113426 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Which of the following are coherent sources?

1. A 60 W and a 100 W bulbs
2. Two bulbs each of 60 W
3. Two halves of a 60 W bulb
4. Two virtual sources obtained by a biprism

Options :

68019153001. 1

68019153002. 2

68019153003. 3

68019153004. 4

Question Number : 27 Question Id : 68019113427 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

In Newton's rings arrangement with air film in reflected light the diameter of n^{th} bright ring is D_n. If the air is replaced by liquid film of refractive index μ, the diameter of n^{th} ring will become:

1. $\sqrt{\mu}D_n$
2. $\frac{1}{\sqrt{\mu}}D_n$
3. $\frac{1}{\mu}D_n$
4. μD_n

Options :

68019153005. 1

68019153006. 2

68019153007. 3

68019153008. 4

Question Number : 28 Question Id : 68019113428 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The intensity ratio of the two interfering beams of light is β. What is the value of $[(I_{max} - I_{min})/(I_{max} + I_{min})]$?

1. $2\sqrt{\beta}$
2. $2\sqrt{\beta}/(1+\beta)$
3. $2/(1+\beta)$
4. $(1+\beta)/2\sqrt{\beta}$

Options :

68019153009. 1

68019153010. 2

68019153011. 3

68019153012. 4

Question Number : 29 Question Id : 68019113429 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

In an experiments similar to Young's experiment, interference is observed using waves associated with electrons. The electron being produced in an electron gun. In order to increase the fringe width:

1. electron gun voltage be increased
2. electron gun voltage be decreased
3. the slits be moved away from each other
4. the screen be moved closer to interfering slits

Options :

68019153013. 1

68019153014. 2

68019153015. 3

68019153016. 4

Question Number : 30 Question Id : 68019113430 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Using light of $\lambda = 5.9 \times 10^{-7} m$, it is found that in a thin film of air, 7.4 fringes occur between two points. Deduce the difference of film thickness between these points.

1. $0.22 \times 10^{-5} m$
2. $0.32 \times 10^{-5} m$
3. $0.44 \times 10^{-5} m$
4. $2.21 \times 10^{-5} m$

Options :

68019153017. 1

68019153018. 2

68019153019. 3

68019153020. 4

Question Number : 31 Question Id : 68019113431 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The main difference in the phenomenon of interference and diffraction is that:

1. diffraction is due to superposition of light waves from the same wave front whereas interference is the superposition of waves from two isolated sources
2. diffraction is due to superposition of light waves from different wave front, whereas the interference is the superposition of two waves derived from the same source
3. diffraction is due to superposition of waves derived from the same source, whereas the interference is the bending of light from the same wavefront
4. diffraction is caused by reflected waves from a source whereas interference caused is due to refraction of waves from a surface

Options :

68019153021. 1

68019153022. 2

68019153023. 3

68019153024. 4

Question Number : 32 Question Id : 68019113432 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

If N is the total number of lines on the grating, n is the order of spectrum and λ is wavelength of light used, then resolving power of grating is given by:

1. $Nn\lambda$
2. Nn
3. $\frac{N\lambda}{n}$
4. $\frac{N}{n}$

Options :

68019153025. 1

68019153026. 2

68019153027. 3

68019153028. 4

Question Number : 33 Question Id : 68019113433 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The condition for obtaining Fraunhofer diffraction from a single slit is that the light wavefront incident on the slit should be:

1. spherical
2. cylindrical
3. elliptical
4. plane

Options :

68019153029. 1

68019153030. 2

68019153031. 3

68019153032. 4

Question Number : 34 Question Id : 68019113434 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

In a diffraction experiment, the size of obstacle in the path of light should be of the order of:

1. 1 mm
2. 0.1 mm
3. 10^{-4} mm
4. 1 cm

Options :

68019153033. 1

68019153034. 2

68019153035. 3

68019153036. 4

Question Number : 35 Question Id : 68019113435 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Yellow light is used in a single slit diffraction experiment with slit width of 0.6 mm. If yellow light is replaced by X-rays, then the observed pattern will reveal:

1. that the central maximum has become narrower
2. more number of fringes
3. less number of fringes
4. no diffraction pattern

Options :

68019153037. 1

68019153038. 2

68019153039. 3

68019153040. 4

Question Number : 36 Question Id : 68019113436 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

If a wave can be polarised it must be:

1. a transverse wave
2. a stationary wave
3. a longitudinal wave
4. an electromagnetic wave

Options :

68019153041. 1

68019153042. 2

68019153043. 3

68019153044. 4

Question Number : 37 Question Id : 68019113437 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

When a circularly polarised light, after passing through quarter wave plate is examined through a rotating Nicol prism, the emergent light would show that:

1. the intensity of emergent light is $(1/4)^{th}$ to the intensity of incident light
2. there is no variation of intensity
3. there is variation of intensity with minimum zero
4. that the intensity of emergent and that of incident light is same

Options :

68019153045. 1

68019153046. 2

68019153047. 3

68019153048. 4

Question Number : 38 Question Id : 68019113438 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

When unpolarised light falls on two Nicol prisms so oriented that no light is transmitted. If a third Nicol prism is placed between them, not parallel to either of the two above Nicol prisms, then:

1. no light is transmitted
2. some light is transmitted
3. light may or may not be transmitted
4. exactly 50% light is transmitted

Options :

68019153049. 1

68019153050. 2

68019153051. 3

68019153052. 4

Question Number : 39 Question Id : 68019113439 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Unpolarised light can be converted into a partially polarised or plane polarised light by several processes. Which of the following can do this?
(A). Reflection
(B). Refraction
(C). Double refraction
(D). Diffraction
Choose the ***correct*** answer from the options given below:

1. (A), (B) and (D) only.
2. (A), (B) and (C) only.
3. (A), (B), (C) and (D).
4. (B), (C) and (D) only.

Options :

68019153053. 1

68019153054. 2

68019153055. 3

68019153056. 4

Question Number : 40 Question Id : 68019113440 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

If 8 *cm* length of 5% solution causes the optical rotation of 20°. How much length of 10% solution of the same substance will cause 35° rotation ?

1. 7 *cm*
2. 8 *cm*
3. 12 *cm*
4. 15 *cm*

Options :

68019153057. 1

68019153058. 2

68019153059. 3

68019153060. 4

Question Number : 41 Question Id : 68019113441 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Choose the correct statements for photoelectric effect:
(A). The number of photoelectron emitted is proportional to light intensity
(B). The velocity of photoelectons is proportional to frequency of light
(C). Photoelectric effect is an instantaneous process
(D). Stopping potential is independent of incident frequency
Choose the ***correct*** answer from the options given below:

1. (A), (B) and (D) only.
2. (A), (B) and (C) only.
3. (A), (B), (C) and (D).
4. (B), (C) and (D) only.

Options :

68019153061. 1

68019153062. 2

68019153063. 3

68019153064. 4

Question Number : 42 Question Id : 68019113442 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

According to the uncertainty relation the minimum uncertainty in the velocity of electron orbiting around the nucleus in an orbit of radius r is:

1. $\frac{\hbar}{2\pi mr}$
2. $\frac{\hbar}{2mr}$
3. $2\pi mr$
4. 0

Options :

68019153065. 1

68019153066. 2

68019153067. 3

68019153068. 4

Question Number : 43 Question Id : 68019113443 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

In reversible process, the entropy of the system:

1. increases
2. decreases
3. remains constant
4. remains zero

Options :

68019153069. 1

68019153070. 2

68019153071. 3

68019153072. 4

Question Number : 44 Question Id : 68019113444 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The relative permittivity of distilled water is 81. Calculate the velocity of light in it.

1. $2.0 \times 10^7 m/s$
2. $2.8 \times 10^7 m/s$
3. $3.3 \times 10^7 m/s$
4. $3.0 \times 10^8 m/s$

Options :

68019153073. 1

68019153074. 2

68019153075. 3

68019153076. 4

Question Number : 45 Question Id : 68019113445 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Copper crystal belongs to:

1. bcc structure
2. close packed fcc structure
3. close packed hexagonal structure
4. face centred tetragonal structure

Options :

68019153077. 1

68019153078. 2

68019153079. 3

68019153080. 4

Question Number : 46 Question Id : 68019113446 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Dielectric materials are mainly:

1. insulating
2. conducting
3. semiconducting
4. ferroelectric

Options :

68019153081. 1

68019153082. 2

68019153083. 3

68019153084. 4

Question Number : 47 Question Id : 68019113447 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The resistivity of a metal

1. increases linearly with T at high temperatures
2. decreases linearly with T at high temperatures
3. is proportional to T^3 at high temperatures
4. is proportional to $T^{1/3}$ at high temperatures

Options :

68019153085. 1

68019153086. 2

68019153087. 3

68019153088. 4

Question Number : 48 Question Id : 68019113448 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The resistivity of a sample semiconductor is 9 milli-ohm-metre. Its holes have mobility of 0.03 $m^2/V\text{-}s$. The Hall coefficient is:

1. $1.7 \times 10^{-4} m^3/C$
2. $2.7 \times 10^{-4} m^3/C$
3. $3.4 \times 10^{-4} m^3/C$
4. $4.9 \times 10^{-4} m^3/C$

Options :

68019153089. 1

68019153090. 2

68019153091. 3

68019153092. 4

Question Number : 49 Question Id : 68019113449 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Cooper pair is a system of two electrons bound by exchange of:

1. phonon between them
2. photon between them
3. proton between them
4. neutron between them

Options :

68019153093. 1

68019153094. 2

68019153095. 3

68019153096. 4

Question Number : 50 Question Id : 68019113450 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The diamagnetic susceptibility of a diamagnetic material is:

1. small and negative
2. small and positive
3. large and negative
4. large and positive

Options :

68019153097. 1

68019153098. 2

68019153099. 3

68019153100. 4

Question Number : 51 Question Id : 68019113451 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Out of all the 20 standard amino acids, which one of the following amino acid does not has any asymmetric carbon atom

1. Lysine
2. Glycine
3. Alanine
4. Tyrosine

Options :

68019153101. 1

68019153102. 2

68019153103. 3

68019153104. 4

Question Number : 52 Question Id : 68019113452 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

A sample of purified DNA contains 20 mole percentage of Cytosine (C). If only the four major bases are present i.e. A,T,G, and C, then the mole percentage of Purine residues in the DNA sample is:

1. 40%
2. 60%
3. 30%
4. 20%

Options :

68019153105. 1

68019153106. 2

68019153107. 3

68019153108. 4

Question Number : 53 Question Id : 68019113453 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Match **List-I** with **List-II**

List-I Enzymes		**List-II Function/Role**	
A.	Hydrolases	I.	Transfer of groups from one molecule to another
B.	Isomerases	II.	Catalyze oxidation-reduction reactions
C.	Oxidoreductases	III.	Catalyze intramolecular arrangements and produces isomeric forms
D.	Transferases	IV.	Cleavage of bonds by adding water

Choose the **correct** answer from the options given below:

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

Options :

68019153109. 1

68019153110. 2

68019153111. 3

68019153112. 4

Question Number : 54 Question Id : 68019113454 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

In Citric acid cycle, how many steps are involved in Oxidation-Reduction ?

1. Two
2. One
3. Five
4. Four

Options :

68019153113. 1

68019153114. 2

68019153115. 3

68019153116. 4

Question Number : 55 Question Id : 68019113455 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Blood performs which of the following functions
(A). Transportation of gases, nutrients, hormones, and wastes.
(B). Protection against blood loss by clotting.
(C). Regulation of pH, body temperature and water content of cells.
(D). Protection against diseases through phagocytic activity with cells and antibodies.
Choose the ***correct*** answer from the options given below:

1. (A), (B) and (D) only
2. (A), (B), (C) and (D)
3. (A), (B) and (C) only
4. (B), (C) and (D) only

Options :

68019153117. 1

68019153118. 2

68019153119. 3

68019153120. 4

Question Number : 56 Question Id : 68019113456 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Phospholipids derived from sphingosine are known as

1. Glycolipids
2. Sphingophospholipids
3. Lipoproteins
4. Glycerophospholipids

Options :

68019153121. 1

68019153122. 2

68019153123. 3

68019153124. 4

Question Number : 57 Question Id : 68019113457 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The plasma membrane of human RBC has

1. 45% Lipid and 47% Protein
2. 43% Lipid and 49% Protein
3. 40% Lipid and 52% Protein
4. 35% Lipid and 57% Protein

Options :

68019153125. 1

68019153126. 2

68019153127. 3

68019153128. 4

Question Number : 58 Question Id : 68019113458 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Given below are two statements, one is labelled as Assertion (A) and other one labelled as Reason (R).
Assertion (A) : The overall size of prokaryotic and eukaryotic Ribosomes are 70 S and 80 S respectively.
Reason (R) : The small subunit of prokaryotic and eukaryotic Ribosomes are 30 S and 40 S respectively. The Large subunit of prokaryotic and eukaryotic Ribosomes are 50 S and 60 S respectively.
In light of the above statements, choose the *correct* answer from the options given below.

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. (A) is false but (R) is true.

Options :

68019153129. 1

68019153130. 2

68019153131. 3

68019153132. 4

Question Number : 59 Question Id : 68019113459 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Match **List-I** with **List-II**

List-I Phases		List-II Features	
A.	Metaphase	I.	Splitting of Centromeres, separation of chromatids and they move to opposite poles
B.	Anaphase	II.	Formation of furrow/cell plate and divides cell cytoplasm into two
C.	Telophase	III.	Chromosomes get aligned along the metaphase plate through spindle fibres
D.	Cytokinesis	IV.	Nuclear envelope assembles around the chromosomes

Choose the **correct** answer from the options given below:

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

Options :

68019153133. 1

68019153134. 2

68019153135. 3

68019153136. 4

Question Number : 60 Question Id : 68019113460 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Formation of Chiasmata occurs at which stage of Prophase I in Meiosis I ?

1. Leptotene
2. Pachytene
3. Zygotene
4. Diplotene

Options :

68019153137. 1

68019153138. 2

68019153139. 3

68019153140. 4

Question Number : 61 Question Id : 68019113461 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

From the following, identify the statements which are true for a tumor suppressor gene, p53
(A). It encodes 53 kDa protein
(B). It is located on chromosome no. 17
(C). It is known as guardian of genome
(D). It Checks progression of cell cycle in G_1 phase
Choose the ***correct*** answer from the options given below:

1. (A), (B) and (D) only.
2. (A), (B) and (C) only.
3. (A), (B), (C) and (D).
4. (B), (C) and (D) only.

Options :

68019153141. 1

68019153142. 2

68019153143. 3

68019153144. 4

Question Number : 62 Question Id : 68019113462 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

If pH of a solution HA, which dissociates into $H^+ + A^-$, equals the pK_a, then
(A). the concentration of the acid form of compound [HA] equals the concentration of dissociated form of the compound [A^-]
(B). the solution has higher capacity for buffering than at any other pH.
(C). the pH of a solution is 7.
(D). the hydrogen ion concentration is equal to dissociated of the acid HA into $H^+ + A^-$.
Which of the above statements are ***correct*** ?
Choose the right option of the following.

1. (A), (B) and (D) only.
2. (A), (B) and (C) only.
3. (A), (B), (C) and (D).
4. (B), (C) and (D) only.

Options :

68019153145. 1

68019153146. 2

68019153147. 3

68019153148. 4

Question Number : 63 Question Id : 68019113463 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Match **List-I** with **List-II**

List-I ENDOCRINE GLANDS		**List-II HORMONES**	
A.	Adrenal Cortex	I.	T_3 and T_4
B.	Ovaries	II.	Testosterone
C.	Thyroid Gland	III.	Aldosterone
D.	Testes	IV.	Progesterone

Choose the **correct** answer from the options given below:

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

Options :

68019153149. 1

68019153150. 2

68019153151. 3

68019153152. 4

Question Number : 64 Question Id : 68019113464 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Given below are two statements:
Statement (I): DNA Polymerase activity is involved in the proof reading activity during DNA replication.
Statement (II): 5' - 3' exonuclease activity is involved in the proof reading activity during DNA replication.
In light of the above statements,choose the *most appropriate* answer from the options given below.

1. Both Statement (I) and Statement (II) are true.
2. Both Statement (I) and Statement (II) are false.
3. Statement (I) is true but Statement (II) is false.
4. Statement (I) is false but Statement (II) is true.

Options :

68019153153. 1

68019153154. 2

68019153155. 3

68019153156. 4

Question Number : 65 Question Id : 68019113465 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Telomerase is
(A). involved in replication of linear double stranded DNA.
(B). species specific
(C). a ribonucleoprotein.
(D). present in somatic cells.
Choose the ***correct*** answer from the options given below:

1. (A), (B) and (D) only.
2. (A), (B) and (C) only.
3. (A), (B), (C) and (D).
4. (B), (C) and (D) only.

Options :

68019153157. 1

68019153158. 2

68019153159. 3

68019153160. 4

Question Number : 66 Question Id : 68019113466 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

In E. coli, during mismatch repair the parental strand is identified by

1. Glycosylated adenines
2. Methylated adenines
3. Single stranded breaks
4. Methylation of Guanine at 6th position.

Options :

68019153161. 1

68019153162. 2

68019153163. 3

68019153164. 4

Question Number : 67 Question Id : 68019113467 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Given below are two statements, one is labelled as Assertion (A) and other one labelled as Reason (R).
Assertion (A) : During pre tRNA processing, addition of poly A tail takes place.
Reason (R) : Addition of CCA sequence at 3' end takes place during pre tRNA processing.

In light of the above statements, choose the *correct* answer from the options given below.

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. (A) is false but (R) is true.

Options :

68019153165. 1

68019153166. 2

68019153167. 3

68019153168. 4

Question Number : 68 Question Id : 68019113468 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Shine Dalgarno sequence is involved in

1. Binding of DNA polymerase to ori during DNA replication.
2. Binding of RNA polymerase during transcription.
3. Binding of Snurps during splicing.
4. Binding of ribosomes to mRNA during translation initiation

Options :

68019153169. 1

68019153170. 2

68019153171. 3

68019153172. 4

Question Number : 69 Question Id : 68019113469 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The clot consists of

1. Blood
2. Network of insoluble protein fibers
3. Serum
4. Platelets

Options :

68019153173. 1

68019153174. 2

68019153175. 3

68019153176. 4

Question Number : 70 Question Id : 68019113470 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Given below are two statements, one is labelled as Assertion (A) and other one labelled as Reason (R).
Assertion (A) : The first heart sound 'lub' is heard when ventricles contract at systole, and second heart sound 'dup' is heard when ventricles relax at beginning of diastole.
Reason (R) : The 'lub' sound is associated with closure of AV valves, and the 'dup' sound is associated with closure of semi lunar valves.
In light of the above statements, choose the *most appropriate* answer from the options given below .

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

Options :

68019153177. 1

68019153178. 2

68019153179. 3

68019153180. 4

Question Number : 71 Question Id : 68019113471 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Match **List-I** with **List-II**

List-I DISEASE		List-II CAUSATIVE AGENTS	
A.	Syphilis	I.	*Mycobacterium tuberculi*
B.	Tuberculosis	II.	*Treponema pallidum*
C.	AIDS	III.	*Bordetella pertussis*
D.	Whooping Cough	IV.	Human Immunodeficiency Virus

Choose the **correct** answer from the options given below:

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

Options :

68019153181. 1

68019153182. 2

68019153183. 3

68019153184. 4

Question Number : 72 Question Id : 68019113472 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

5- Methylcytosines are common sites for the mutations as

1. They can mispair with Adenine.
2. They can deaminate to Uracil.
3. They can pair with Uracil
4. They can deaminate to Thymidine.

Options :

68019153185. 1

68019153186. 2

68019153187. 3

68019153188. 4

Question Number : 73 Question Id : 68019113473 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Match **List-I** with **List-II**

List-I		**List-II**	
A.	Incomplete Dominance	I.	Skin colour in Human beings
B.	Complementary Genes	II.	AB blood group in Human beings
C.	Polygenes	III.	Pink Flower in 4 o clock plant
D.	Co dominance	IV.	Purple color in maize

Choose the **correct** answer from the options given below:

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

Options :

68019153189. 1

68019153190. 2

68019153191. 3

68019153192. 4

Question Number : 74 Question Id : 68019113474 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Given below are two statements:
Statement (I): Innate immune response is antigen non-specific, and rapid.
Statement (II): Adaptive immune response is antigen specific, and rapid.
In light of the above statements,choose the *most appropriate* answer from the options given below.

1. Both Statement (I) and Statement (II) are true.
2. Both Statement (I) and Statement (II) are false.
3. Statement (I) is true but Statement (II) is false.
4. Statement (I) is false but Statement (II) is true.

Options :

68019153193. 1

68019153194. 2

68019153195. 3

68019153196. 4

Question Number : 75 Question Id : 68019113475 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The smallest unit of antigen that has capacity to bind with antibodies is known as

1. Paratope
2. Epitope
3. Monotope
4. Hapten

Options :

68019153197. 1

68019153198. 2

68019153199. 3

68019153200. 4