NMIMS NPAT 2019 Question Paper

NMIMS National Test for Programs after Twelfth

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Notations :

1.Options shown in green color and with ✔ icon are correct.

2.Options shown in red color and with ✖ icon are incorrect.

Question Paper Name:	NPAT Engineering 2019 11th May 2019 S1
Subject Name:	NPAT Engineering 2019
Creation Date:	2019-05-11 14:37:52
Duration:	120
Total Marks:	120
Display Marks:	Yes
Calculator:	None
Magnifying Glass Required?:	No
Ruler Required?:	No
Eraser Required?:	No
Scratch Pad Required?:	No
Rough Sketch/Notepad Required?:	No
Protractor Required?:	No
Show Watermark on Console?:	Yes
Highlighter:	No
Auto Save on Console?:	No

NPAT Engineering 2019

Group Number :	1
Group Id :	39321123
Group Maximum Duration :	0
Group Minimum Duration :	120
Revisit allowed for view? :	No
Revisit allowed for edit? :	No
Break time:	0
Group Marks:	120

Physics

Section Id :	39321179
Section Number :	1
Section type :	Online
Mandatory or Optional:	Mandatory
Number of Questions:	30
Number of Questions to be attempted:	30
Section Marks:	30
Display Number Panel:	Yes
Group All Questions:	No

Sub-Section Number:	1
Sub-Section Id:	393211215

Question Number : 1 Question Id : 3932112395 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

One fermi is equal to:

Options :

1. ✖ 10^{-13} m

2. ✖ 10^{-14} m

3. ✔ 10^{-15} m

4. ✖ 10^{-18} m

Question Number : 2 Question Id : 3932112396 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A ball is thrown with a speed of 50 m/s vertically upwards. The distance travelled by it in the fifth second of its journey will be:

(Take $g = 10$ m/s^2)

Options :

1. ✔ 5 m

2. ✖ 7.5 m

3. ✖ 10 m

4. ✖ 15 m

Question Number : 3 Question Id : 3932112397 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A particle starts from origin at t = 0 with a velocity of 1.0 i m/s and moves along x-y plane with a constant acceleration of (2.0 i + 4.0 j) m/s^2. Here i and j are unit vectors along x-axis and y-axis respectively. At what time will the x- coordinate of the particle be 20 m?

Options :

1. ✖ At 3 s

2. ✔ At 4 s

3. ✖ At 5 s

4. ✖ At 6 s

Question Number : 4 Question Id : 3932112398 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 1 Wrong Marks : 0

The thermodynamic process in which no heat flows between the system and the surroundings is known as:

Options :

1. ✖ isothermal process

2. ✖ isobaric process

3. ✔ adiabatic process

4. ✖ isochoric process

Question Number : 5 Question Id : 3932112399 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 1 Wrong Marks : 0

The efficiency of a Carnot engine operating between $127°C$ and $27°C$ is:

Options :

1. ✖ 10%

2. ✖ 15%

3. ✖ 20%

4. ✔ 25%

Question Number : 6 Question Id : 3932112400 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 1 Wrong Marks : 0

When 1 kg of water at $100°C$ is converted into steam at the same temperature and at 1 atmospheric pressure, its volume increases by $1.7 \, m^3$. In this process, what happens to the internal energy of the system?

(Take 1 atm pressure = 100 kPa and latent heat of vaporisation of water = 2.25×10^6 J/kg)

Options :

1. ✖ It decreases by 1.04×10^6 J

2. ✖ It increases by 1.04×10^6 J

3. ✖ It decreases by 2.08×10^6 J

4. ✔ It increases by 2.08×10^6 J

Question Number : 7 Question Id : 3932112401 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A man raises a box of 10 kg through a height of 2 m. The work done by the force of gravity in this process is:

Options :

1. ✖ 20 J

2. ✖ −20 J

3. ✖ 196 J

4. ✔ −196 J

Question Number : 8 Question Id : 3932112402 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A 2.0 kg object is moving along a straight line with a speed of 4.0 m/s. In order to increase its speed to 8.0 m/s, the net work done on the object must be:

Options :

1. ✖ 24 J

2. ✖ 36 J

3. ✔ 48 J

4. ✖ 60 J

Question Number : 9 Question Id : 3932112403 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A block of wood of mass 0.5 kg is suspended from the ceiling by means of thin wires. A bullet of mass 0.01 kg and horizontal speed 100 m/s strikes the block and instantly comes to rest with respect to the block. The height to which the block rises will be close to:

(Take $g = 10 \ m/s^2$)

Options :

1. ✖ 16 cm

2. ✔ 19 cm

3. ✖ 23 cm

4. ✖ 31 cm

Question Number : 10 Question Id : 3932112404 Question Type : MCQ Option Shuffling : Ye
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The moment of inertia of a thin rod of mass M and length L about an axis perpendicular to the rod at its midpoint is:

Options :

1. ✖ $\dfrac{ML^2}{4}$

2. ✖ $\dfrac{ML^2}{6}$

3. ✖ $\dfrac{ML^2}{8}$

4. ✔ $\dfrac{ML^2}{12}$

Question Number : 11 Question Id : 3932112405 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A planet has a mass $\dfrac{1}{10}$ of the mass of the Earth and radius half that of the Earth. If a person weighs 600 N on the Earth, his weight on the planet would be:

Options :

1. ✖ 60 N

2. ✖ 120 N

3. ✔ 240 N

4. ✖ 600 N

Question Number : 12 Question Id : 3932112406 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A man of mass 60 kg stands on a weighing scale in a lift. The lift is moving upwards with an acceleration of 4 m/s^2.

The reading of the scale will be:

(Take g = 10 m/s^2)

Options :

1. ✖ 18 kg

2. ✖ 36 kg

3. ✖ 60 kg

Question Number : 13 Question Id : 3932112407 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Block A of mass 2.5 kg rests on a horizontal table. It is attached to a string that passes over a massless and frictionless pulley. Block B of mass 4.0 kg is suspended from the other end of the string. If $\mu_s = 0.6$ and $\mu_k = 0.4$ between A and the table, the acceleration of the blocks when released will be about:

(Take $g = 10 \, m/s^2$)

Options :

1. ✖ $2.3 \, m/s^2$

2. ✖ $3.2 \, m/s^2$

3. ✔ $4.6 \, m/s^2$

4. ✖ $5.2 \, m/s^2$

Question Number : 14 Question Id : 3932112408 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

What is the force necessary to stretch a copper wire ($Y = 1.2 \times 10^{11} \, N/m^2$) of radius 1 mm by 1%?

Options :

1. ✖ $1.86 \times 10^3 \, N$

2. ✔ $3.77 \times 10^3 \, N$

3. ✖ $4.35 \times 10^3 \, N$

4. ✖ $5.72 \times 10^3 \, N$

Question Number : 15 Question Id : 3932112409 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The truth table given below is for:

Input		Output
A	B	Y
0	0	0
0	1	0
1	0	0
1	1	1

Options :

1. ✖ OR gate

2. ✖ NOT gate

3. ✖ NAND gate

4. ✔ AND gate

Question Number : 16 Question Id : 3932112410 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 1 Wrong Marks : 0

The dopant used to make Ge n-type semiconductor has _____ electrons in the outer shell.

Options :

1. ✖ 3

2. ✖ 4

3. ✔ 5

4. ✖ 6

Question Number : 17 Question Id : 3932112411 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 1 Wrong Marks : 0

The average thermal energy of a helium atom at $27\,^{\circ}$C is about:

(Boltzmann constant = 1.38×10^{-23} J K^{-1})

Options :

1. ✖ 5.6×10^{-22} J

2. ✖ 3.1×10^{-21} J

3. ✔ 6.2×10^{-21} J

4. ✖ 5.1×10^{-20} J

Question Number : 18 Question Id : 3932112412 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 1 Wrong Marks : 0

A body oscillates with simple harmonic motion according to the equation $x = (5.0\text{ m}) \cos\left[(\pi\, rad/s)t + \frac{\pi}{3}\, rad\right]$. The magnitude of its velocity at t = 4 s will be about:

Options :

1. ✖ 0.65 m/s

2. ✖ 4.62 m/s

3. ✖ 6.31 m/s

4. ✔ 7.85 m/s

Question Number : 19 Question Id : 3932112413 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A pipe 15.0 cm long is open at both ends. Which harmonic mode of the pipe will resonate at 2.2 kHz source? (Take the speed of sound in air as 330 m/s.)

Options :

1. ✖ 1st

2. ✔ 2nd

3. ✖ 3rd

4. ✖ 4th

Question Number : 20 Question Id : 3932112414 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The resistance of a wire of length L and radius r is R. The resistance of another wire made of the same material but twice its length and half its radius will be:

Options :

1. ✖ 2R

2. ✖ 4R

3. ✖ 6R

4. ✔ 8R

Question Number : 21 Question Id : 3932112415 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A 12 Ω and 24 Ω resistors are connected in parallel. The combination is connected in series with a 22 Ω resistor and a 6 V battery. The current in the 12 Ω resistor will be:

Options :

1. ✖ $\left(\frac{1}{15}\right)$ A

2. ✔ $\left(\frac{2}{15}\right)$ A

3. ✖ $\left(\frac{3}{15}\right)$ A

4. ✖ $\left(\frac{4}{15}\right)$ A

Question Number : 22 Question Id : 3932112416 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A current of 4 A is maintained in a 20 Ω resistor. The amount of charge that flows through the resistor in one minute is:

Options :

1. ✖ 4 C

2. ✖ 5 C

3. ✔ 240 C

4. ✖ 480 C

Question Number : 23 Question Id : 3932112417 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The magnetic field due to a straight infinite conductor carrying current I at a distance r is:

Options :

1. ✔ $\mu_o \frac{I}{(2\pi r)}$

2. ✖ $\mu_o \frac{I}{(\pi r)}$

3. ✖ $\mu_o \frac{I}{(2 r)}$

4. ✖ $\mu_o \frac{I}{(r)}$

Question Number : 24 Question Id : 3932112418 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

An electron moves with a speed of 2×10^7 m/s in a magnetic field of 9×10^{-4} T perpendicular to it. The radius of the path of electron (charge = 1.6×10^{-19} C and mass = 9×10^{-31} kg) will be about:

Options :

1. ✖ 6.25 cm

2. ✔ 12.5 cm

3. ✖ 21.8 cm

4. ✖ 32.6 cm

Question Number : 25 Question Id : 3932112419 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

An AC voltage is applied to a pure inductor .The current in the circuit will:

Options :

1. ✔ lag the voltage by $\dfrac{\pi}{2}$

2. ✖ lead the voltage by $\dfrac{\pi}{2}$

3. ✖ lag the voltage by $\dfrac{\pi}{4}$

4. ✖ lead the voltage by $\dfrac{\pi}{4}$

Question Number : 26 Question Id : 3932112420 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A circular loop of radius 10 cm and resistance $\dfrac{11}{7}$ m Ω is placed in a magnetic field which is normal to the plane of the loop. In order to induce a current of 6 A in the loop, the magnetic field must change with time at the rate of:

Options :

1. ✖ 0.1 T/s

2. ✖ 0.2 T/s

3. ✔ 0.3 T/s

4. ✖ 0.4 T/s

Question Number : 27 Question Id : 3932112421 Question Type : MCQ Option Shuffling : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

An object is placed on the axis of a concave mirror at a point between its focus and centre of curvature. The image formed will be:

Options :

1. ✖ real and diminished

2. ✔ real and enlarged

3. ✖ real and of the same size

4. ✖ virtual and enlarged

**Question Number : 28 Question Id : 3932112422 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical**

Correct Marks : 1 Wrong Marks : 0

The radius of curvature of each face of a double convex lens is 10 cm. If its focal length is 10 cm, the refractive index of the glass will be:

Options :

1. ✔ 1.5

2. ✖ 1.8

3. ✖ 2.0

4. ✖ 2.4

**Question Number : 29 Question Id : 3932112423 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical**

Correct Marks : 1 Wrong Marks : 0

In a Young's double experiment, the screen is placed at a distance of 1.00 m from the slits. With a source of a wavelength 580 nm, the distance between alternate bright fringes is 0.80 cm. The separation of the double slits will be:

Options :

1. ✖ 2.84×10^{-5} m

2. ✖ 4.52×10^{-5} m

3. ✖ 6.36×10^{-5} m

4. ✔ 7.25×10^{-5} m

**Question Number : 30 Question Id : 3932112424 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical**

Correct Marks : 1 Wrong Marks : 0

Two point charges, A of 1.0 µC and B of 2.5 µC, are located in an x - y plane at poi
respectively. Let i and j be the unit vectors along x-axis and y-axis respectively. Th
vector notation will be:

Options :

1. ✗ $(1.8\,N)\,i + (2.4\,N)\,j$

2. ✔ $(2.7\,N)\,i + (3.6\,N)\,j$

3. ✗ $(5.4\,N)\,i + (7.2\,N)\,j$

4. ✗ $(7.2\,N)\,i + (9.6\,N)\,j$

Chemistry

Section Id :	39321180
Section Number :	2
Section type :	Online
Mandatory or Optional:	Mandatory
Number of Questions:	30
Number of Questions to be attempted:	30
Section Marks:	30
Display Number Panel:	Yes
Group All Questions:	No

Sub-Section Number:	1
Sub-Section Id:	393211216
Question Shuffling Allowed :	Yes

Question Number : 31 Question Id : 3932112425 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

0.4 gram of oxygen occupies a fixed volume in a gas syringe at 90 ° C. 0.2 gram of another gas X occupies the same volume in the syringe at the same temperature and pressure. What is the relative molecular mass expressed, in gram, of the gas X?
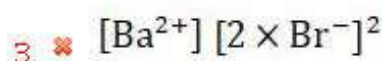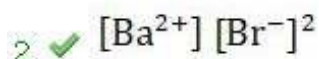
Options :

1. ✔ 16

2. ✗ 32

3. ✗ 48

4. ✗ 64

Question Number : 32 Question Id : 3932112426 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following species has an energy shell having principal qu

Options :

1. ✖ Al^{3+}

2. ✖ Ne

3. ✖ Na^+

4. ✔ Cl^-

Question Number : 33 Question Id : 3932112427 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following has the greatest value of charge to mass ratio?

Options :

1. ✖ Proton

2. ✖ Electron

3. ✔ Neutron

4. ✖ Alpha particle

Question Number : 34 Question Id : 3932112428 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A molecule is square pyramidal in shape. Which of the following types of hybridisation of the central atom explains this shape?

Options :

1. ✖ dsp^2

2. ✔ sp^3d^2

3. ✖ d^2Sp^3

4. ✖ sp^3d

Question Number : 35 Question Id : 3932112429 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following molecules has the net dipole moment?

Options :

1. ✖ Carbon dioxide

2. ✖ Boron trifluoride

3. ✖ Beryllium fluoride

4. ✔ Hydrogen iodide

Question Number : 36 Question Id : 3932112430 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The bond enthalpies of P - Cl and Cl - Cl bonds are 330 and 240 k j mol^{-1} respectively. Consider below reaction:

$$PCl_5(s) \rightarrow PCl_3(g) + Cl_2(g)$$

The enthalpy change of the above reaction is:

Options :

1. ✖ $+90 \text{ KJ mol}^{-1}$

2. ✖ -90 KJ mol^{-1}

3. ✖ -420 KJ mol^{-1}

4. ✔ $+420 \text{ KJ mol}^{-1}$

Question Number : 37 Question Id : 3932112431 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

On adding 3.0 gram of a solute X, with molecular mass 60, to 100 cm^3 of solvent A, the depression in freezing point is the same as on adding 6.0 gram of a solute Y to 100 cm^3 of the same solvent A. What is the molecular mass of the substance Y?
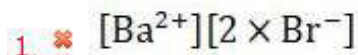
Options :

1. ✖ 240

2. ✔ 120

3. ✖ 60

4. ✖ 30

Question Number : 38 Question Id : 3932112432 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

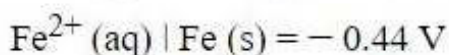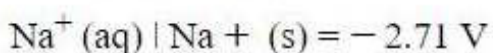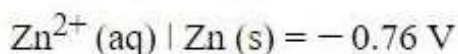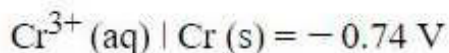Which of the following expressions represents the solubility product of

Options :

1. ✖ $[Ba^{2+}][2 \times Br^-]$

2. ✔ $[Ba^{2+}] [Br^-]^2$
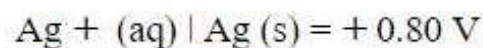
3. ✖ $[Ba^{2+}] [2 \times Br^-]^2$

4. ✖ $[BaBr_2]$

Question Number : 39 Question Id : 3932112433 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The standard electrode potential values of some metals are as follows:

$Ag + (aq) \mid Ag (s) = + 0.80$ V

$Cr^{3+} (aq) \mid Cr (s) = - 0.74$ V

$Zn^{2+} (aq) \mid Zn (s) = - 0.76$ V

$Na^+ (aq) \mid Na + (s) = - 2.71$ V

$Fe^{2+} (aq) \mid Fe (s) = - 0.44$ V

Which of the following statements is correct with respect to the above elements?

Options :

1. ✖ Silver metal is the most powerful reducing agent.

2. ✔ Zinc metal can be used to provide a protective coating over iron.
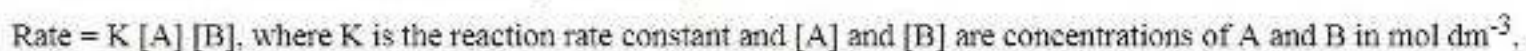
3. ✖ Sodium metal is the strongest oxidising agent.

4. ✖ Iron cannot displace silver from aqueous silver nitrate solution.

Question Number : 40 Question Id : 3932112434 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
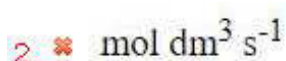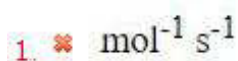
Correct Marks : 1 Wrong Marks : 0

The rate of a second order reaction is represented by:

Rate = K [A] [B], where K is the reaction rate constant and [A] and [B] are concentrations of A and B in mol dm^{-3}.

The SI unit of k is:

Options :

1. ✖ $mol^{-1} s^{-1}$

2. ✖ $mol\ dm^3\ s^{-1}$

3. ✓ $mol^{-1} dm^3 s^{-1}$

4. ✗ $mol^{-2} dm^6 s^{-1}$

Sub-Section Number:	2
Sub-Section Id:	393211217
Question Shuffling Allowed :	Yes

Question Number : 41 Question Id : 3932112435 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following properties of group-II elements decreases on moving down the group?

Options :

1. ✗ Electropositive character

2. ✓ First ionisation enthalpy

3. ✗ Atomic radius

4. ✗ Ionic radius

Question Number : 42 Question Id : 3932112436 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The first ionisation energy values of three successive elements are 1685, 2075 and 496 kJ mol^{-1}. Which of the following options represents these three elements?

Options :

1. ✓ Sodium, magnesium, aluminium

2. ✗ Neon, sodium, magnesium

3. ✗ Oxygen, fluorine, neon

4. ✗ Fluorine, neon, sodium

Question Number : 43 Question Id : 3932112437 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

One mole of each of the following compounds is strongly heated and, the gases, if any produced, were collected at room temperature and pressure. Which of the following compounds will produce gas at Sta

(STP)?

Options :

1. ✖ Calcium hydroxide

2. ✖ Sodium chloride

3. ✔ Magnesium carbonate

4. ✖ Magnesium nitrate

Question Number : 44 Question Id : 3932112438 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following is the strongest base?

Options :

1. ✖ Magnesium hydroxide

2. ✖ Calcium hydroxide

3. ✖ Strontium hydroxide

4. ✔ Barium hydroxide

Question Number : 45 Question Id : 3932112439 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The oxidation state shown by oxygen in OF_2 is:

Options :

1. ✖ $+6$

2. ✖ $+5$

3. ✔ $+2$

4. ✖ -2

Question Number : 46 Question Id : 3932112440 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which one of the following is the chemical formula of peroxodisulphuric acid?

Options :

1. ✖ H_2SO_5

2. ✖ $H_2S_2O_6$

3. ✖ $H_2S_2O_7$

4. ✔ $H_2S_2O_8$

Question Number : 47 Question Id : 3932112441 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

What is the electronic configuration of iron cation that forms the complex ion $[Fe\,(CN)_6]^{4-}$?

Given: Atomic number of Fe = 26. [Ar] represents electronic configuration of argon.

Options :

1. ✖ $[Ar]\,3d^3\,4s^2$

2. ✖ $[Ar]\,3d^4\,4s^2$

3. ✖ $[Ar]\,3d^5\,4s^1$

4. ✔ $[Ar]\,3d^6\,4s^0$

Question Number : 48 Question Id : 3932112442 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which option correctly represents the adverse effects of the presence of nitrogen oxide and methane, respectively, on the environment?

Options :

1. ✖ Photochemical smog and acid rain

2. ✔ Acid rain and global warming

3. ✖ Acid rain due to both

4. ✖ Global warming and acid rain

Question Number : 49 Question Id : 3932112443 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following metal ores is concentrated by the process of leaching?

Options :

1. ✔ Bauxite

2. ✖ Copper glance

3. ✖ Zinc blende

4. ✖ Calamine

Question Number : 50 Question Id : 3932112444 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 1 Wrong Marks : 0

Which of the following methods is preferred for refining of zirconium and titanium metals?

Options :

1. ✖ Zone refining

2. ✖ Electrolytic method

3. ✔ Van Arkel

4. ✖ Liquation

Sub-Section Number:	3
Sub-Section Id:	393211218
Question Shuffling Allowed :	Yes

Question Number : 51 Question Id : 3932112445 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 1 Wrong Marks : 0

Which of the following tests can be used to characterise carbonyl group in an organic compound?

Options :

1. ✖ Carbylamine test

2. ✖ Azo dye test

3. ✔ 2,4-dinitrophenyl hydrazine test

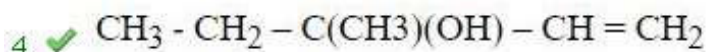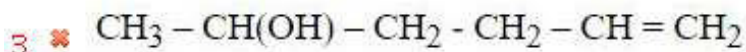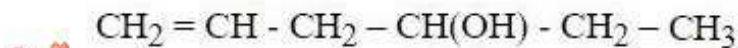4. ✖ Solubility in sodium hydroxide solution

Question Number : 52 Question Id : 3932112446 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 1 Wrong Marks : 0

On catalytic hydrogenation, one mole of an optically active alcohol X (molecular formula = $C_6H_{12}O$) absorbs one mole of hydrogen and gives an optically inactive compound Y. The compound X is represented by the chemical formula:

Options :

1. ✖ $(CH_3)_2\text{-}C(OH) - CH_2 - CH = CH_2$

2. $CH_2 = CH - CH_2 - CH(OH) - CH_2 - CH_3$

3. $CH_3 - CH(OH) - CH_2 - CH_2 - CH = CH_2$

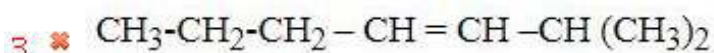4. ✓ $CH_3 - CH_2 - C(CH_3)(OH) - CH = CH_2$

Question Number : 53 Question Id : 3932112447 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The ozonolysis of compound A produced a mixture of propanone and 2- methyl propanal. Which of the following represents compound A?

Options :

1. $(CH_3)_2 C = C (CH_3)_2$

2. ✓ $(CH_3)_2 C = CH - CH (CH_3)_2$

3. $CH_3 - CH_2 - CH_2 - CH = CH - CH (CH_3)_2$

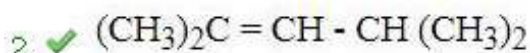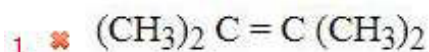4. $(CH_3)_2 CH - CH = CH - CH (CH_3)_2$

Question Number : 54 Question Id : 3932112448 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following is a cationic detergent?

Options :

1. $CH_3 - (CH_2)_{10} - SO_3 Na$

2. $C_{17}H_{35}COONa$

3. ✓ $CH_3 - (CH_2)_{15} - N^+(CH_3)_3 Br^-$

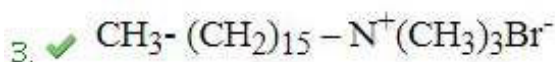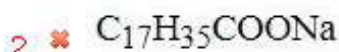4. $CH_3 - (CH_2)_{16} - COO - (CH_2 - CH_2O)_n - CH_2 - CH_2 - OH$

Question Number : 55 Question Id : 3932112449 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The artificial sweetening agent, Ortho sulphobenzamide is also known as:

Options :

1. sucralose

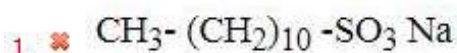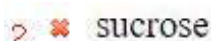2. sucrose

3. ✔ saccharin

4. ✘ alitame

Question Number : 56 Question Id : 3932112450 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 1 Wrong Marks : 0

Which of the following compounds does NOT give positive iodoform test?

Options :

1. ✘ Ethanal

2. ✘ Ethanol

3. ✔ Propanol

4. ✘ 1-Methyl 1-propanol

Question Number : 57 Question Id : 3932112451 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 1 Wrong Marks : 0

Which of the following is correct for azo dye test?

Options :

1. ✔ Aniline → diazotization → Coupling with 1- naphthol

2. ✘ p- toluidine → diazotization → coupling with 2- naphthol

3. ✘ Ethylamine → diazotization → coupling with 2- naphthol

4. ✘ Ethylamine → diazotization → coupling with 1- naphthol

Question Number : 58 Question Id : 3932112452 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 1 Wrong Marks : 0

An organic compound X, with molecular formula $C_4H_{10}O$, gives a compound Y on treating with alcoholic potassium hydroxide. On ozonolysis, Y gives Z, which gives a positive 2,4-DNP test. What is compound X?

Options :

1. ✔ 1butanol

2. ✘ 2-pentenol

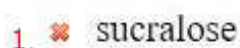3. ✘ Butanal

4. ✖ 1-propanol

Question Number : 59 Question Id : 3932112453 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 1 Wrong Marks : 0

Arrange the following in an increasing order of their acidic character.

(i) 2,4-Dinitrophenol

(ii) 4-Hydroxytoluene

(iii) 2-Nitrophenol

Options :

1. ✖ (i) < (ii) < (iii)

2. ✔ (ii) < (iii) < (i)

3. ✖ (ii) < (i) < (iii)

4. ✖ (i) < (iii) < (ii)

Question Number : 60 Question Id : 3932112454 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 1 Wrong Marks : 0

Which of the following options represents nylon 6,6 polymer?

Options :

1. ✖ $= N\text{-}(CH_2)_6 N = C(OH) \text{-} (CH_2)_6 \text{-} C(OH) =$

2. ✖ $\text{-}NH\text{-}(CH_2)_6 NH \text{-} CO \text{-} (CH_2)_6 \text{-} CO\text{-}$

3. ✔ $\text{-}NH\text{-}(CH_2)_6 NH \text{-} CO \text{-} (CH_2)_4 \text{-} CO\text{-}$

4. ✖ $\text{-}NH\text{-}(CH_2)_5 NH \text{-} CO \text{-} (CH_2)_5 \text{-} CO\text{-}$

Maths

Section Id :	39321181
Section Number :	3
Section type :	Online
Mandatory or Optional:	Mandatory
Number of Questions:	30
Number of Questions to be attempted:	30
Section Marks:	30
Display Number Panel:	Yes
Group All Questions:	No

Question Number : 61 Question Id : 3932112455 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Let $z = x + iy$, $z_1 = 4(2 + i)$ and $z_2 = 2(3 + 2i)$.

If $\arg\left(\dfrac{z - z_1}{z - z_2}\right) = \dfrac{\pi}{4}$, then which of the following is true?

Options :

1. ✖ $x^2 + y^2 + 14x + 10y + 72 = 0$

2. ✖ $x^2 + y^2 - 14x + 10y + 36 = 0$

3. ✖ $x^2 + y^2 + 14x - 10y + 36 = 0$

4. ✔ $x^2 + y^2 - 14x - 10y + 72 = 0$

Question Number : 62 Question Id : 3932112456 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If the roots of the equation $x^2 + px + q = 0$ are real and distinct and they differ by at most r, then q lies in the interval:

Options :

1. ✖ $[p^2 - r^2, p^2]$

2. ✖ $(p^2 - r^2, p^2)$

3. ✔ $\left[\dfrac{1}{4}(p^2 - r^2), \dfrac{1}{4}p^2\right)$

4. ✖ $\left[\dfrac{1}{2}(p^2 - r^2), p^2\right]$

Question Number : 63 Question Id : 3932112457 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If $\alpha^2 = 8\alpha - 5$ and $\beta^2 = 8\beta - 5$ where $\alpha \neq \beta$, then the equation whose roots are $\dfrac{\alpha}{\beta}$ and $\dfrac{\beta}{\alpha}$ is:

Options :

1. ✖ $5x^2 + 54x - 5 = 0$

2. ✔ $5x^2 - 54x + 5 = 0$

3. ✖ $5x^2 + 62x - 1 = 0$

4. ✖ $5x^2 - 62x + 1 = 0$

Question Number : 64 Question Id : 3932112458 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Let A and B be two nonempty sets.

$(A \cup B) - (A \cap B) = ?$

Options :

1. ✔ $(A - B) \cup (B - A)$

2. ✖ $(A - B) \cap (B - A)$

3. ✖ $(A - B) \cap (A \cup B)$

4. ✖ $(B - A) \cap (A \cup B)$

Question Number : 65 Question Id : 3932112459 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If $f(x) = x + x^{-1}$, then $f(x^3) + 3f\left(\frac{1}{x}\right) = ?$

Options :

1. ✖ $f(x^{-3}) + f(3x)$

2. ✔ $(f(x))^3$

3. ✖ $(f(x))^3 + 3f\left(\frac{1}{3x}\right)$

4. ✖ $f(x^3) + f(3x)$

Question Number : 66 Question Id : 3932112460 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If $f^{-1}\left(\frac{1}{x+1}\right) = 2x - 3$, then $(f(3))^{-1} + (f(11))^{-1} = ?$

Options :

1. ✔ 12

2. ✖ 17

Question Number : 67 Question Id : 3932112461 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If $A = \begin{bmatrix} 0 & 1 & 3 \\ 1 & x & 1 \\ 2 & 3 & 1 \end{bmatrix}$, $A^{-1} = \frac{1}{2}\begin{bmatrix} 1 & -8 & 5 \\ -1 & 6 & -3 \\ 1 & 2y & 1 \end{bmatrix}$ then the value of $(x - y)$ is:

Options :

1. ✸ 0

2. ✸ 1

3. ✸ 2

4. ✔ 3

Question Number : 68 Question Id : 3932112462 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If $A = \begin{vmatrix} a & a-b & b+c \\ b & b-c & c+a \\ c & c-a & a+b \end{vmatrix} = k\,(a+b+c)$ then the value of k is:

Options :

1. ✸ $a^2 + b^2 + c^2$

2. ✸ $ab + bc + ca$

3. ✔ $\frac{1}{2}[(a-b)^2 + (b-c)^2 + (c-a)^2]$

4. ✸ $a^2 + b^2 + c^2 + ab + bc + ca$

Question Number : 69 Question Id : 3932112463 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

When the sum of all 4-digit numbers, that can be formed by using the digits 2, 4, 6 and 8 (repetition of digits NOT allowed), is divided by 101, the quotient is:

Options :

1. ✸ 132

2. ✸ 110

3. ✖ 1110

4. ✔ 1320

Question Number : 70 Question Id : 3932112464 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

How many different pairs (x, y) can be formed using numbers from the list of integers {1, 2, 3, …., 20} such that x < y and x + y is even?

Options :

1. ✖ 45

2. ✖ 55

3. ✔ 90

4. ✖ 95

Question Number : 71 Question Id : 3932112465 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The coefficient of x^6 in the expansion of $\left(\dfrac{x^2}{4} + \dfrac{2}{x}\right)^{12}$ is:

Options :

1. ✖ $\dfrac{231}{32}$

2. ✔ $\dfrac{231}{16}$

3. ✖ 132

4. ✖ 166

Question Number : 72 Question Id : 3932112466 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In an arithmetic progression, if the sum of the first 100 terms is 50 and the sum of the first 200 terms is 90, then the sum of the first 300 terms is:

Options :

1. ✖ 140

2. ✖ 100

3. ✔ 120

4. ✖ 130

Question Number : 73 Question Id : 3932112467 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If $(1 - x + x^2)^n = a_0 + a_1 x + a_2 x^2 + \cdots + a_{2n} x^{2n}$, then $a_0 + a_2 + a_4 + \cdots + a_{2n}$ is equal to:

Options :

1. ✖ $3^n + \dfrac{1}{2}$

2. ✖ $3^n + 2$

3. ✔ $\dfrac{3^n + 1}{2}$

4. ✖ $\dfrac{3^n - 1}{2}$

Question Number : 74 Question Id : 3932112468 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If $\lim\limits_{x \to 0} \dfrac{5^x - 1}{\sqrt{4+x} - 2} = \log(\lambda^k)$ then the value of $(\lambda + k)$ where λ and k are positive integers is:

Options :

1. ✔ 9

2. ✖ 7

3. ✖ 5

4. ✖ 3

Question Number : 75 Question Id : 3932112469 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If $f(x) = \begin{cases} 2a - x & , \quad -a < x < a \\ 3x - 2a & \quad x \geq a \end{cases}$ then which of the following is true?

Options :

1. ✖ f (x) is differentiable at x = a.

2. ✖ f (x) is not continuous at x = a.

3. ✅ f (x) is continuous at x = a but not differentiable at x = a.

4. ✖ f (x) is differentiable irrespective of value of a.

Question Number : 76 Question Id : 3932112470 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If $y = \tan^{-1}x^n + \tan^n x - \tan^{-1}\dfrac{a + x^n}{1 - ax^n}$, then $\dfrac{dy}{dx} = ?$

Options :

1. ✖ $(n - 1) \tan^{n-1}x \sec^2 x$

2. ✅ $n \tan^{n-1}x \sec^2 x$

3. ✖ $n (x - 1) \tan^n x \sec^2 x$

4. ✖ $n x^n \tan^{-1}x \sec^2 x$

Question Number : 77 Question Id : 3932112471 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If $\int \dfrac{2\sin x + 3\cos x}{3\sin x + 4\cos x}\ dx = k_1\ x + k_2 \log|3\sin x + 4\cos x| + k_3$, then the value of $k_1 - 3k_2 = ?$

Options :

1. ✖ $\dfrac{2}{5}$

2. ✖ $\dfrac{1}{5}$

3. ✅ $\dfrac{3}{5}$

4. ✖ $\dfrac{4}{5}$

Question Number : 78 Question Id : 3932112472 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The value of the integral $\int_{\frac{3}{4}}^{\frac{4}{3}} \dfrac{dx}{x\sqrt{x^2+1}}$ is:

Options :

.

1. ✖ $\log\left(\frac{3}{4}\right)$

2. ✔ $\log\left(\frac{3}{2}\right)$

3. ✖ $\log\left(\frac{2}{3}\right)$

4. ✖ $\log\left(\frac{4}{3}\right)$

Question Number : 79 Question Id : 3932112473 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The x – coordinates of the foci of the ellipse $x^2 - 2x + 2y^2 = 3$ are:

Options :

1. ✖ $\pm\sqrt{2}$

2. ✖ $\pm\sqrt{6}$

3. ✖ $1 \pm \sqrt{6}$

4. ✔ $1 \pm \sqrt{2}$

Question Number : 80 Question Id : 3932112474 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A circle of radius r passes through the origin and meets the coordinate axes at P and Q, respectively.

The locus of the centroid of ΔOPQ, where O is origin, is a:

Options :

1. ✔ circle

2. ✖ parabola

3. ✖ ellipse

4. ✖ hyperbola

Question Number : 81 Question Id : 3932112475 Question Type : MCQ Option Shuffling : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If the lines x − 2y − 6 = 0, 3x + y − 4 = 0 and kx + 4y + k = 0 are concurrent, then the value of k lies between:

Options :

1. ✖ 1 and 1.5

2. ✖ 1.5 and 2

3. ✖ 2 and 2.5

4. ✔ 2.5 and 3

Question Number : 82 Question Id : 3932112476 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If the points $(1, 1, \lambda)$ and $(-3, 0, 1)$ are equidistant from the plane $\vec{r} \cdot (3\,\hat{i} + 4\,\hat{j} - 12\,\hat{k}) + 13 = 0$, then the values of λ are:

Options :

1. ✖ $1, \dfrac{5}{3}$

2. ✖ $2, \dfrac{7}{3}$

3. ✔ $1, \dfrac{7}{3}$

4. ✖ $2, \dfrac{5}{3}$

Question Number : 83 Question Id : 3932112477 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The line joining the points $(2, 2, -1)$ and $(3, 4, 2)$ intersects the line joining the points $(7, 0, 6)$ and $(2, 5, 1)$ at $P(\alpha, \beta, \gamma)$. The value of $(2\alpha - 3\beta + \gamma)$ is:

Options :

1. ✖ 4

2. ✔ −4

3. ✖ 3

4. ✖ −3

Question Number : 84 Question Id : 3932112478 Question Type : MCQ Option Shuffling : Ye Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If the vectors $3\hat{i} + \lambda\hat{j} + 5\hat{k}$, $\hat{i} + 2\hat{j} - 3\hat{k}$ and $2\hat{i} - \hat{j} + \hat{k}$ are coplanar, then the value of λ is:

Options :

1. ✔ -4

2. ✘ -1

3. ✘ 4

4. ✘ 1

Question Number : 85 Question Id : 3932112479 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Unit vector parallel to the sum of vectors $3\hat{i} + 3\hat{j} + \hat{k}$ and $-2\hat{i} + \hat{j} - 2\hat{k}$ is $\alpha\hat{i} + \beta\hat{j} + \gamma\hat{k}$. Then value of $(2\alpha + \beta - 3\gamma)$ is:

Options :

1. ✔ $\dfrac{3}{\sqrt{2}}$

2. ✘ $\dfrac{4}{\sqrt{2}}$

3. ✘ $\dfrac{5}{\sqrt{2}}$

4. ✘ $\dfrac{6}{\sqrt{2}}$

Question Number : 86 Question Id : 3932112480 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The mean of 5 observations is 7. If four of them are 6, 7, 8 and 10, then the standard deviation of all the five observations is:

Options :

1. ✘ 1.5

2. ✔ 2

3. ✘ 2.5

4. ✘ 3

Question Number : 87 Question Id : 3932112481 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 1 Wrong Marks : 0

A and B are two events of a random experiment such that $P(A') = 0.3$, $P(B) = 0.4$ and $P(A \cap B') = 0.5$. Here A' and B' are the complements of A and B respectively.

Then which of the following is NOT true?

Options :

1. ✘ $P(A \cup B) = \dfrac{9}{10}$

2. ✘ $P(B \cap A') = \dfrac{1}{5}$

3. ✘ $P(A' \cup B') = \dfrac{4}{5}$

4. ✔ $P(A \mid A \cup B) = \dfrac{7}{8}$

Question Number : 88 Question Id : 3932112482 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 1 Wrong Marks : 0

The value of $2\cos\dfrac{\pi}{13}\cos\dfrac{9\pi}{13} + \cos\dfrac{3\pi}{13} + \cos\dfrac{5\pi}{13}$ is:

Options :

1. ✔ 0

2. ✘ 1

3. ✘ -1

4. ✘ $-\dfrac{1}{2}$

Question Number : 89 Question Id : 3932112483 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 1 Wrong Marks : 0

The value of $\sin^{-1}\dfrac{4}{5} + 3\tan^{-1}\dfrac{1}{3} + \tan^{-1}\dfrac{1}{2}$ is:

Options :

1. ✘ $\dfrac{\pi}{2}$

2. ✔ $\dfrac{3\pi}{4}$

3. ✖ π

4. ✖ $\dfrac{5\pi}{4}$

Question Number : 90 Question Id : 3932112484 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Given that $0 < x < \pi$ and $\sin x + \cos x = \dfrac{1}{5}$. Then tan x is equal to:

Options :

1. ✖ $\dfrac{4}{3}$

2. ✖ $\dfrac{3}{4}$

3. ✔ $-\dfrac{4}{3}$

4. ✖ $-\dfrac{3}{4}$

Logical Intelligence

Section Id :	39321182
Section Number :	4
Section type :	Online
Mandatory or Optional:	Mandatory
Number of Questions:	15
Number of Questions to be attempted:	15
Section Marks:	20
Display Number Panel:	Yes
Group All Questions:	No

Sub-Section Number:	1
Sub-Section Id:	393211220
Question Shuffling Allowed :	Yes

Question Id : 3932112485 Question Type : COMPREHENSION Sub Question Shuffling Allowed : Yes Group Comprehension Questions : No

Question Numbers : (91 to 93)

Question Label : Comprehension

Read the given information and answer the questions that follow.

The criteria for selecting a student for admission into an engineering college are as follows.

The candidate:

1. must have passed Class 12 science examination with more than 65% marks

2. must have secured more than 60% marks in the written test

3. must not be less than 18 years and more than 22 years of age as on 1 January 2019

4. must have secured at least 60% marks in the physics paper in Class 12 science examination

However, if a candidate fulfils all the above criteria EXCEPT:

a. (2) and (3), but belongs to the SC community and has secured at least 70% marks in Class 12 science examination, his/her case is to be referred to the Principal of the college.

b. (3) and (4), but is a girl with more than 65% marks in the written test, his/her case is to be referred to the Chairman of the Admissions Committee.

Sub questions

Question Number : 91 Question Id : 3932112486 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Asha, an SC girl, passed her Class 12 science examination in 2016 at the age of 17, securing 68% marks in the aggregate and 60% marks in the physics paper as well as in the written test. What decision should be taken in case of Asha?

Options :

1. ✖ She is to be selected.

2. ✔ She is not to be selected.

3. ✖ Her case is to be referred to the Principal of the college.

4. ✖ Her case is to be referred to the Chairman of the Admissions Committee.

Question Number : 92 Question Id : 3932112487 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Tarun, an SC boy, secured 67% marks in his Class 12 examination, with 65% marks in the physics paper. He also got 65% marks in the written test. He was born in 1998. What decision should be taken for Tarun?

Options :

1. ✔ He is to be selected.

2. ✘ He is not to be selected.

3. ✘ His case is to be referred to the Principal of the college.

4. ✘ His case is to be referred to the Chairman of the Admissions Committee.

Question Number : 93 Question Id : 3932112488 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Geeta finished her Class 12 science course with 71% marks in the examination. She was born in an SC family in 2002. She secured 63% marks in the physics paper and 61% marks in the written test. What decision should be taken for her?

Options :

1. ✘ She is to be selected.

2. ✘ She is not to be selected.

3. ✔ Her case is to be referred to the Principal of the college.

4. ✘ Her case is to be referred to the Chairman of the Admissions Committee.

Sub-Section Number:	2
Sub-Section Id:	393211221
Question Shuffling Allowed :	Yes

Question Number : 94 Question Id : 3932112489 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Eight houses, A to H, are in two rows facing each other, with four houses in each row. B is facing E, which is adjacent to C. G is at one end of the row and facing D. F is between B and H. A is located diagonally opposite G and is adjacent to C. Which house is opposite F?

Options :

1. ✖ G

2. ✖ E

3. ✔ C

4. ✖ A

Question Number : 95 Question Id : 3932112490 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Among five objects, F, G, H, J and K, G is twice as heavy as J and 10 kg heavier than K. H is one and a half times as heavy as F, and F is one and a half times as heavy as J. Which object is heaviest of all?

Options :

1. ✖ G

2. ✔ H

3. ✖ K

4. ✖ F

Question Number : 96 Question Id : 3932112491 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Two statements are given, followed by two conclusions numbered I and II. Assuming the statements to be true even if they seem to be at variance with commonly known facts, decide which of the conclusions logically follow(s) from the given statements.

Statements:

All fictions are books.

No book is a note.

Conclusions:

I. Some fictions are notes.

II. No fiction is a note.

Options :

1. ✖ Only conclusion I follows.

2. ✔ Only conclusion II follows.

3. ✘ Either conclusion I or II follows.

4. ✘ Both conclusions I and II follow.

Question Number : 97 Question Id : 3932112492 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Two statements are given, followed by three conclusions numbered I, II and III. Assuming the statements to be true even if they seem to be at variance with commonly known facts, decide which of the conclusions logically follow(s) from the given statements.

Statements:

Some cups are mugs.

All mugs are jars.

Conclusions:

  I.   Some jars are cups.
  II. No mug is a cup.
  III. Some jars are mugs.

Options :

1. ✘ Only conclusion I follows.

2. ✘ Only conclusions II and III follow.

3. ✔ Only conclusions I and III follow.

4. ✘ None of the conclusions follow.

Question Number : 98 Question Id : 3932112493 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Three statements are given, followed by four conclusions numbered I to IV. Assuming the statements to be true even if they seem to be at variance with commonly known facts, decide which of the conclusions logically follow(s) from the given statements.

Statements:
1. Some cars are four-wheelers.
2. All four-wheelers are vehicles.
3. Some vehicles are trucks.

Conclusions:
I. Some cars are vehicles.
II. No four-wheeler is a truck.
III. All cars are vehicles.
IV. Some four-wheelers are trucks.

Options :

1. ✖ Only conclusions I and IV follow.

2. ✖ Only conclusions I, III and IV follow.

3. ✔ Only conclusion I and either II or IV follow.

4. ✖ Only conclusion IV and either I or III follow.

Question Number : 99 Question Id : 3932112494 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 1 Wrong Marks : 0

A question is given, followed by two arguments numbered I and II. Decide which of the argument is strong with respect to the question.

Question:

Should hunting of wild animals be completely banned?

Arguments:
I. Yes. Hunting wild animals is a potential environmental hazard.
II. No. The survival of the people living in forests is important, as they have to hunt wild animals for food.

Options :

1. ✔ Only argument I is strong.

2. ✖ Only argument II is strong.

3. ✖ Both arguments I and II are strong.
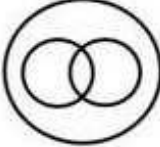
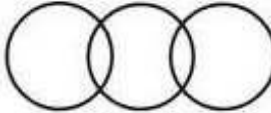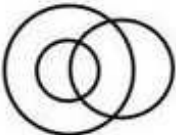4. ✖ Neither argument I nor II is strong.

Question Number : 100 Question Id : 3932112495 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 1 Wrong Marks : 0

A statement is given, followed by two assumptions numbered I and II. Decide which of the assumptions is implicit in the statement.

Statement:

The legal luminaries are suggesting for setting up village courts.

Assumptions:

I. The city courts consider that time is wasted in solving small disputes arising in villages.

II. The villagers should not run to the city for small disputes that can be settled at their level.

Options :

1. ✖ Only assumption I is implicit.

2. ✔ Only assumption II is implicit.

3. ✖ Both assumptions I and II are implicit.

4. ✖ Neither assumption I nor II is implicit.

Question Number : 101 Question Id : 3932112496 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
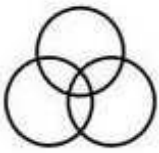**Correct Marks : 1 Wrong Marks : 0**

Which of the following Venn diagrams best illustrates the relationship between the following classes?

Women, Athletes, Olympians

Options :

1. ✖

2. ✖

3. ✖

4. ✔

In the following diagram, the triangle stands for 'Indians', the rectangle stands for 'Hindi speaking people', the circle stands for 'Educated people' and the square stands for 'Villagers'. The numbers in different segments represent the number of persons.
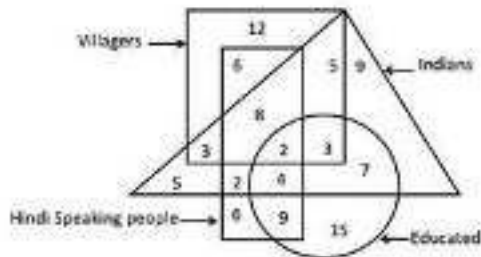
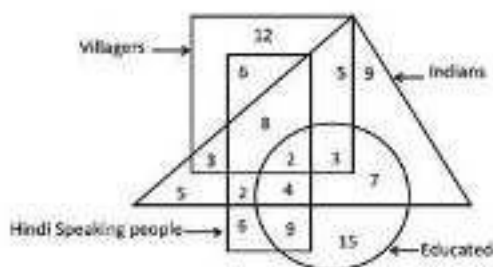How many educated Indians speak Hindi but are NOT villagers?

Options :

1. ✖ 2

2. ✔ 4

3. ✖ 6

4. ✖ 7

In the following diagram, the triangle stands for 'Indians', the rectangle stands for 'Hindi speaking people', the circle stands for 'Educated people' and the square stands for 'Villagers'. The numbers in different segments represent the number of persons.

How many Hindi speaking Indians are villagers but are Not educated?

Options :

1. ✖ 2

2. ✖ 6

3. ✔ 8

4. ✖ 10

Question Number : 104 Question Id : 3932112499 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which two signs should be interchanged in the following equation to make it correct?

$$30 \times 6 + 15 - 12 \div 6 = 6$$

Options :

1. ✖ $\times$ and $+$

2. ✖ $-$ and $\div$

3. ✖ $-$ and $\times$

4. ✔ $+$ and $\div$

Question Number : 105 Question Id : 3932112500 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Three statements are given, followed by three conclusions. The symbols used in them have meanings as follows:

A @ B means A is not smaller than B.

A # B means A is not greater than B.

A & B means A is neither smaller than nor equal to B.

A % B means A is neither greater than nor equal to B.

A $ B means A is neither smaller than nor greater than B.

Now read the following statements and decide which of the conclusions is/are true.

Statements:

Q $ R

S % R

Q @ P

T # S

Conclusions:

I. R @ P

II. S % Q

III. P & S

Options :

1. ✖ Only conclusion I is true.

2. ✖ Only conclusion II is true.

3. ✖ Only conclusions II and III are true.

4. ✔ Only conclusions I and II are true.

|	
Sub-Section Number:	3
Sub-Section Id:	393211222
Question Shuffling Allowed :	Yes

Question Id : 3932112501 Question Type : COMPREHENSION Sub Question Shuffling Allowed : Yes Group Comprehension Questions : No
Question Numbers : (106 to 108)
Question Label : Comprehension

The following bar graph shows the number of students enrolled and the number of students passed from school A over a period of 5 years. Study the graph and answer the questions that follow.

No. of students enrolled and no. of students passed from school A over 5 years
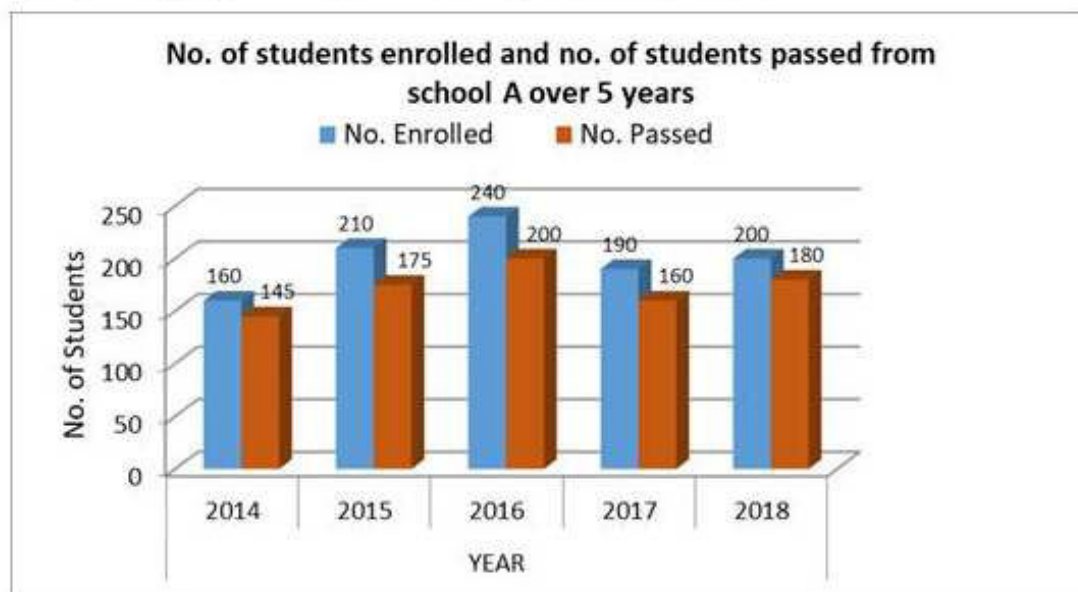
Sub questions

Question Number : 106 Question Id : 3932112502 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 1 Wrong Marks : 0

In which of the following 2 years was the number of passed students as a percentage of the number of enrolled students the same?

Options :

1. ✖ 2014, 2018

2. ✖ 2015, 1017

3. ✔ 2015, 2016

4. ✖ 2016, 2017

Question Number : 107 Question Id : 3932112503 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The average number of students who failed is what percentage of the average number of enrolled students over all the 5 years?

Options :

1. ✔ 14%

2. ✖ 16%

3. ✖ 18%

4. ✖ 13%

Question Number : 108 Question Id : 3932112504 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If the ratio of the male students to female students enrolled every year was 3 : 2 and the ratio of the male students to female students who passed every year was also 3 : 2, what was the ratio of the female students who passed in 2016 to the female students enrolled in the same year?

Options :

1. ✖ 5 : 8

2. ✖ 3 : 5

3. ✖ 3 : 4

4. ✔ 5 : 6

|	
Sub-Section Number:	4
Sub-Section Id:	393211223
Question Shuffling Allowed :	Yes

Question Id : 3932112505 Question Type : COMPREHENSION Sub Question Shuffling Allowed : Yes Group Comprehension Questions : No

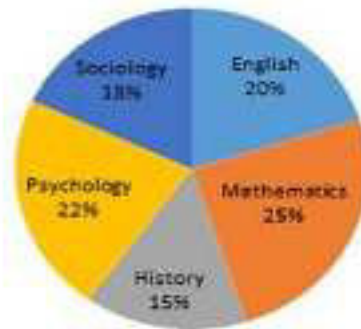**Question Numbers : (109 to 110)**

Question Label : Comprehension

The following pie charts show the percentage-wise distribution of students enrolled in five different graduate-level courses in universities A and B. Study the charts and answer the questions that follow.

University A
Total No. of Students = 2000

Sociology 15%
English 25%
Psychology 20%
Mathematics 22%
History 18%
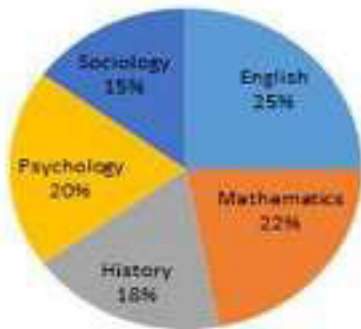
University B
Total No. of Students = 3000

Sociology 18%
English 20%
Psychology 22%
Mathematics 25%
History 15%

Sub questions

Question Number : 109 Question Id : 3932112506 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

What is the ratio of the number of students enrolled in the sociology course of University A to the number of students enrolled in the mathematics course of University B?

Options :

1. ✔ 2 : 5

2. ✘ 3 : 5

3. ✘ 3 : 2

4. ✘ 4 : 5

Question Number : 110 Question Id : 3932112507 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If in each university, the ratio of the number of males to that of females in each department is 2 : 3, what will be the ratio of the number of males enrolled in the history course of University A to the number of females enrolled in the sociology course of University B?

Options :

1. ✘ 4 : 5

2. ✔ 4 : 9

3. ✖ 3 : 5

4. ✖ 4 : 7

Language Proficiency

Section Id :	39321183
Section Number :	5
Section type :	Online
Mandatory or Optional:	Mandatory
Number of Questions:	7
Number of Questions to be attempted:	7
Section Marks:	10
Display Number Panel:	Yes
Group All Questions:	No

Sub-Section Number:	1
Sub-Section Id:	393211224
Question Shuffling Allowed :	Yes

Question Number : 111 Question Id : 3932112508 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In the sentence given below, four phrases have been underlined and the underlined phrases are given as the options.

Identify and select the option that contains an error.

For the most part, water particles travels in circles within the waves.

Options :

1. ✖ For the most part

2. ✖ water particles

3. ✔ travels in circles

4. ✖ within the waves.

Question Number : 112 Question Id : 3932112509 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Select the most appropriate option to fill in the blank.

Some parasitic plants tap _____ the resources of other plants.

Options :

1. ✖ from

2. ✖ on

3. ✔ into

4. ✖ in

Question Number : 113 Question Id : 3932112510 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Select the most appropriate option to fill in the blank.

Cacao seeds _____ more than 300 different chemical compounds.

Options :

1. ✖ are containing

2. ✖ contained

3. ✔ contain

4. ✖ containing

Question Number : 114 Question Id : 3932112511 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Select the most appropriate option to fill in the blank.

As unseasonal rains _____ the city, roads were flooded and traffic came to a standstill.

Options :

1. ✖ smashed

2. ✖ slammed

3. ✔ lashed

4. ✖ beat

Question Number : 115 Question Id : 3932112512 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Sentences of a paragraph are given below in jumbled order. Arrange the sentences in the right order to form a meaningful and coherent paragraph.

    A. In the 9th century, kana, a simpler Japanese script was introduced.

    B. Japanese scribes and scholars spent years mastering its complexities.

    C. Hence, they readily adopted the Chinese script.

    D. The Japanese had no written language when they came under China's in

    E. It could be learnt without years of schooling.

Options :

1. ✖ D, C, E, B, A

2. ✔ D, C, B, A, E

3. ✖ A, B, E, C, D

4. ✖ A, B, D, E. C

Question Number : 116 Question Id : 3932112513 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In the sentence given below, four phrases have been underlined and the underlined phrases are given as the options. Identify and select the option that contains an error.

Scientists believe <u>the Aurora will appear</u> less frequently <u>over the next ten years</u>. <u>Whereas, it will be</u> <u>spotted frequently</u> in northern Norway.

Options :

1. ✖ the Aurora will appear

2. ✖ over the next ten years

3. ✔ Whereas, it will be

4. ✖ spotted frequently

Sub-Section Number:	2
Sub-Section Id:	393211225
Question Shuffling Allowed :	Yes

Question Id : 3932112514 Question Type : COMPREHENSION Sub Question Shuffling Allowed : Yes Group Comprehension Questions : No

Question Numbers : (117 to 120)

Question Label : Comprehension

India's Grasslands

Grasslands…cover vast swathes of landmass throughout the world and support a wide variety of animal life…They are even more useful than forests and provide a host of ecosystem services — storing water and carbon, recycling chemical, and controlling the climate. And, vitally, feeding us and our livestock, besides the wild herbivores that roam the plains. Even the ferocious carnivores must be grateful to grasslands: because grasses feed their prey species. Just three species of grass — rice, wheat and maize — provide us with more than half of our calorific and protein requirements.

In India, almost a quarter of landmass is covered in grassland… Our livestock, no less than 500 million strong, get at least 50 per cent of their fodder from these grasslands, and the strain is beginning to tell.

The list of animals that are dependent on or live in grasslands is a kind of "Who's Who" of the endangered and the almost extinct. The one-horned Indian rhinoceros and wild water buffalo live in the wet grasslands of Kaziranga and Manas Tiger Reserve. The swamp deer live in the terai. Manipur's rare "dancing deer" or "Sangai" thrive on the floating phumdis of Loktak Lake. The lesser florican jumps high in the grasslands of the Western Ghats (during the monsoons), and the Great Indian bustard, (down to 50) stalk haughtily in the dry, short grasslands of Rajasthan. Other rare species include the Nilgir tahr (in the sholas), the hispid hare and the pygmy hog, the last two from the Northeast.

The habitats and ecosystems ought to have been protected by the law because of their precious denizens and the services they provide. But grasslands (except a few) — like the wetlands — in India get no protection. They are free to be exploited. The Forest Department looks at forests, the agriculture department at crops and the animal husbandry department at livestock (but not at what livestock eat). As a result, grasslands are often regarded as wastelands — or turn into one due to over-exploitation, over-grazing, fragmentation and habitat destruction.

(Source: https://indianexpress.com/article/express-sunday-eye/down-jungleland-grasss-silence-5584015/)

Question Number : 117 Question Id : 3932112515 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The main theme of the passage is that grasslands:

Options :

1. ✖ are being destroyed along with our forests

2. ✔ contribute to our ecosystems but are not being protected

3. ✖ are home to many species of plants and animals

4. ✖ help promote the cultivation of wheat and rice

Question Number : 118 Question Id : 3932112516 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Grasslands are helpful in all of the following ways EXCEPT:

Options :

1. ✔ enabling small species to hide from predators

2. ✖ providing food for people and animals

3. ✖ controlling the climate

4. ✖ being a major source of animal fodder

Question Number : 119 Question Id : 3932112517 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The writer uses the term "Who's Who" to indicate the animals that are:

Options :

1. ✖ grass-dependent

2. ✔ most important

3. ✖ unknown

Question Number : 120 Question Id : 3932112518 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The writer feels that one reason why grasslands are being destroyed is that:

Options :

1. ✖ there is overgrazing by cattle and other animals

2. ✖ they are being converted into agricultural land to grow crops

3. ✖ wild animals are overrunning the area covered by them

4. ✔ there is no government agency to protect them